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**PROGRESS REPORT**  
**2021-22**

संसाधन प्रबंधन  
RESOURCE MANAGEMENT

अखिल भारतीय समन्वित गेहूँ एवं जौ अनुसंधान परियोजना

**AICRP on Wheat and Barley**

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# **AICRP on Wheat and Barley**

**PROGRESS REPORT  
2021-22**

## **RESOURCE MANAGEMENT**

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*Dated: 17<sup>th</sup> August, 2022*

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## **SUMMARY**

Food and nutrition security of the country is primarily reliant on natural resources, climatic conditions and agriculture produce. Despite shrinking land and water resources, climate abrasions and little genetic gain, India harvested 106.41 million tonnes of wheat during 2021-22. This was possible by adoption of latest high yielding diseases resistant varieties and their production technologies by Indian farmers. The imbalanced fertilisation and intensive tillage are still matters of concern leading to the degradation of natural resources. The multiple nutrient deficiencies are being reported from various parts of the Indo-Gangetic plains, the food basket of the country which is a result continuous mining of the soil coupled with imbalanced fertilisation. Nitrogen is generally applied in excess in NWPZ and in NEPZ it is applied less than the recommended ones and potash and micronutrients are rarely applied. The situation is further worsened by crop residues burning, which besides causing losses of precious organic source and essential nutrients also leads to environmental pollution causing health hazards. In order to provide food security and reverse the trend in natural resource degradation, technological advancements including developing better varieties suited to different cropping systems and growing conditions in various agro-ecological zones is a must. The higher agricultural productivity has to be achieved along with the improvement or at least without further detrimental effect to the environment and natural resources for long-term sustainability. Research efforts are focussed, in addition to varietal improvement, on the refinement of the technologies, diversification/intensification by including leguminous crops, integrated nutrient and weed management, to make food production cost and input efficient in order to increase the profit margins to the farmers.

The Resource Management group of the “All India Co-ordinated Wheat and Barley Improvement Project” (AICW&BIP), in addition to evaluating the performance of newly developed genotypes, is also actively engaged in developing and fine tuning the farmers’ and eco-friendly, location specific and cost effective technologies for higher productivity and profitability. The work on cost effective technologies is being executed through special trials depending on the priorities of various wheat growing zones. The results of the multi-location varietal evaluation and special co-ordinated trials are summarised hereunder.

In five wheat growing zones, twelve varietal evaluation trial series were conducted at a number of locations under different growing conditions. The newly developed genotypes were evaluated against the existing varieties used as checks. In addition, twelve special coordinated trials were also proposed to address the zone-wise problems and priorities.

The zone-wise details of the varietal evaluation trials conducted are given in Table 1. In all, 85 trials were proposed, of which 83 were conducted. Out of the conducted trials, twenty two trials were rejected due to low yield and/or high CV and improper data reporting. The overall conduct of trial was 97.6 percent with a success and rejection rate of 74.1 percent and 25.9 percent, respectively.

**Table 1. Zone-wise details of the coordinated varietal evaluation trials**

Trial Series	Locations	Trials conducted	Trials not conducted		Rejected	
			Number	Centres	Number	Centres
<b>Northern Hill Zone</b>						
RIR-TS-DOS-TAS	05	05	-	-	01	Khudwani
<b>Total</b>	<b>05</b>	<b>05</b>	<b>-</b>	<b>-</b>	<b>01</b>	<b>-</b>
<b>North Western Plain Zone</b>						
IR-TS-DOS-TAS	09	09	-	-	02	Pantnagar, Karnal
RIR-TS-DOS-TAS	09	09	-	-	01	Karnal
SPL-IR-ES-HYPT	07	07	-	-	05	BISA Ladowal, Delhi, Gurdaspur, Ludhiana, Pantnagar
<b>Total</b>	<b>25</b>	<b>25</b>	<b>-</b>	<b>-</b>	<b>08</b>	<b>-</b>
<b>North Eastern Plain Zone</b>						
IR-TS-DOS-TAS	09	09	-	-	05	Ayodhya, Kalyani, Kanpur, RPCAU Pusa, Sabour
IR-LS-DOS-TAS	09	09	-	-	02	Kanpur, RPCAU Pusa,
<b>Total</b>	<b>18</b>	<b>18</b>	<b>-</b>	<b>-</b>	<b>07</b>	<b>-</b>
<b>Central Zone</b>						
IR-TS-DOS-TAD	08	08	-	-	-	-
IR-LS-DOS-TAS	08	08	-	-	-	-
RIR-TS-TAD	06	06	-	-	02	Durgapura, Udaipur
SPL-IR-ES-HYPT	05	05	-	-	01	Powarkheda
<b>Total</b>	<b>27</b>	<b>27</b>	<b>-</b>	<b>-</b>	<b>03</b>	<b>-</b>
<b>Peninsular Zone</b>						
IR-TS-DOS-TAD	05	04	01	Washim	02	Dharwad, Pune
IR-LS-DOS-TAS	05	04	01	Washim	01	Dharwad
<b>Total</b>	<b>10</b>	<b>08</b>	<b>02</b>	<b>-</b>	<b>03</b>	<b>-</b>
<b>Grand Total</b>	<b>85</b>	<b>83</b>	<b>02</b>	<b>-</b>	<b>22</b>	<b>-</b>

In NHZ, out of 5 proposed trials, all the trials were successfully conducted. One trial at Khudwani in restricted irrigation was not considered for pooled analysis due to improper reporting. In NWPZ, out of 25 proposed trials, all the trials were successfully conducted. Two trials at Karnal and Pantnagar in timely sown condition, one trial at Karnal in restricted irrigation and five trials in early sown HYPT (BISA Ladowal, Delhi, Gurdaspur, Ludhiana and Pantnagar) were not considered for pooling due to low mean target yield. In NEZ, out of 18 proposed trials, all the trials were successfully conducted. Five locations (Ayodhya, Kalyani, Kanpur, RPCAU Pusa, Sabour) in timely sown and two locations (Kanpur, RPCAU Pusa) in late sown were not considered for pooling due to low mean target yield. In CZ, out of 27 proposed trials, all the trials were successfully conducted. Two locations (Durgapura, Udaipur) in restricted



irrigation and one location (Powarkheda) in HYPT were not considered for pooling due to low mean target yield. In PZ, out of 10 proposed trials, 8 trial trials were successfully conducted and Washim centre did not conduct both allotted trials. Two locations (Dharwad, Pune) in timely sown and one location (Dharwad) in late sown were not considered for pooling due to low mean target yield. The centres where the trials were not conducted or where the trials were rejected have been listed in the Table 1.

The performance of 28 final year test entries under different trials is presented in Table 2. In NHZ one test entry VL 2041 was evacuated under restricted irrigation conditions but was inferior to the best check HS 562. In NWPZ, under IR-TS-DOS-TAS trial, two test genotypes namely PBW826 and HD3406 were tested against four check varieties DBW187, DBW222, HD2967 and HD3086. In terms of yield, the test entry PBW826 recorded significant superiority over all other entries in timely sowing (60.30 q/ha) as well as on overall basis (53.94 q/ha) and the best check was DBW222. In RIR-TS-TAS trial, three test entries HI1653, HI1654 and HD3369 were tested and all were found inferior to the best check HUW838. In NHZ, NEPZ and CZ, none of the test entries showed either numerical or significant superiority over the best check varieties. In PZ, test entry HI8826(d) showed numerical superiority (4.51%) over best check variety MACS3949(d).

**Table 2. Performance of new genotypes in various agro-climatic zones**

Zone wise trial	Test entries	Entry sowing superiority		Best check	Yield gain, %	Locations
		Numerical	Significant			
<b>North Hill Zone</b>						
RIR-TS-TAS	VL 2041	-	-	HS 562	-	04
<b>North Western Plain Zone</b>						
IR-TS-DOS-TAS	PBW 826, HD3406	-	PBW 826	DBW222	3.49	07
RIR-TS-TAS	HI1653, HI1654, HD3369	-	-	HUW838	-	08
SPL-IR-ES-HYPT	DBW370, DBW371, DBW372, PBW872	DBW371	PBW872	DBW327 DBW327	4.10 0.34	02 02
<b>North Eastern Plain Zone</b>						
IR-TS-DOS-TAS	HD 3411, PBW 826, HD 3406			HD 2733	-	04
IR-LS-DOS-TAS	DBW 316, PBW 833 PBW 835	PBW 835		HI1563	-	07
<b>Central Zone</b>						
IR-TS-DOS-TAD	HI 1650, MACS 6768 MP 3535	-	-	HI1544	-	08
IR-LS-DOS-TAS	HD 3407	-	-	CG 1029	-	08
RIR-TS-TAD	HI 1655, CG 1036, HI 8830 (d) DDW 55 (d)	-	-	DBW 110	-	04
SPL-IR-ES-HYPT	DBW 372	-	-	GW 322	-	04
<b>Peninsular Zone</b>						
IR-TS-DOS-TAD	MACS4100(d), HI8826(d), DBW320	HI8826(d)	-	MACS3949(d)	4.51	02
IR-LS-DOS-TAS		-	-	HD2932	-	03

**Table 3. Zone-wise details of the special agronomic trials**

Trial Series	Locations	Trials conducted	Trials not conducted	
			Number	Centres
<b>Northern Hill Zone</b>				
SPL-1: Efficacy of herbicides against diverse weed flora of wheat	02	02	-	-
SPL-2: Effect of seaweed extract	02	02	-	-
SPL-3: Effect of nano urea under irrigated conditions	01	01	-	-
SPL-4: Effect of nano urea under restricted irrigation conditions	01	01	-	-
SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat	01	01	-	-
<b>Total</b>	<b>07</b>	<b>07</b>	<b>-</b>	<b>-</b>
<b>North Western Plains Zone</b>				
SPL-1: Efficacy of herbicides against diverse weed flora of wheat	04	03	01	Ludhiana
SPL-2: Effect of seaweed extract	04	03	01	Sriganganagar
SPL-3: Effect of nano urea under irrigated conditions	08	08	-	-
SPL-4: Effect of nano urea under restricted irrigation conditions	04	04	-	-
SPL-8: Improving wheat yield through foliar K application	01	01	-	-
SPL-9: Agronomic interventions for quality enhancement in wheat	04	04	-	-
SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat	05	05	-	-
<b>Total</b>	<b>30</b>	<b>28</b>	<b>02</b>	
<b>North Eastern Plains Zone</b>				
SPL-1: Efficacy of herbicides against diverse weed flora of wheat	04	04	-	-
SPL-2: Effect of seaweed extract	04	04	-	-
SPL-3: Effect of nano urea under irrigated conditions	05	05	-	-
SPL-4: Effect of nano urea under restricted irrigation conditions	05	05	-	-
SPL-8: Improving wheat yield through foliar K application	02	02	-	-
SPL-9: Agronomic interventions for quality enhancement in wheat	01	01	-	-
SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat	03	03	-	-
<b>Total</b>	<b>24</b>	<b>24</b>	<b>-</b>	
<b>Central Zone</b>				
SPL-1: Efficacy of herbicides against diverse weed flora of wheat	06	06	-	-
SPL-2: Effect of seaweed extract	03	03	-	-
SPL-3: Effect of nano urea under irrigated conditions	07	07	-	-
SPL-4: Effect of nano urea under restricted irrigation conditions	03	03	-	-
SPL-5: Lodging management for enhancing yield of dicoccum wheat using PGR	01	01	-	-
SPL-8: Improving wheat yield through foliar K application	04	04	-	-
SPL-9: Agronomic interventions for quality enhancement in wheat	01	01	-	-
SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat	03	03	-	-
<b>Total</b>	<b>28</b>	<b>28</b>	<b>-</b>	
<b>Peninsular Zone</b>				
SPL-1: Efficacy of herbicides against diverse weed flora of wheat	02	02	-	-
SPL-2: Effect of seaweed extract	03	03	-	-
SPL-3: Effect of nano urea under irrigated conditions	04	04	-	-
SPL-4: Effect of nano urea under restricted irrigation conditions	01	-	01	Washim
SPL-5: Lodging management for enhancing yield of dicoccum wheat using PGR	03	03	-	-
SPL-6: RCTs for enhancing the wheat productivity	03	03	-	-
SPL-7: Precision NM through fertigation	01	01	-	-
SPL-8: Improving wheat yield through foliar K application	02	02	-	-
SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat	01	01	-	-
SPL-11: Improving wheat productivity through silica foliar application	01	01	-	-
SPL-12: Improving wheat productivity through nutrients solubilizing microbial (Rhizosphere) consortium	03	01	02	Akola, Washim
<b>Total</b>	<b>24</b>	<b>21</b>	<b>03</b>	
<b>Grand Total</b>	<b>113</b>	<b>108</b>	<b>05</b>	

The details of the special trials conducted in different zones are presented in Table 3. In all, 113 trials were proposed, out of which 108 were conducted and the conduct percentage was

95.6. The maximum numbers of special trials were conducted in NWPZ (28) followed by CZ (28), NEPZ (24), PZ (21) and NHZ (07).

### Northern Hill Zone

In this zone, the performance of test genotype was evaluated under restricted irrigation conditions at different locations and results are summarized here under;

### Restricted Irrigation

In NHZ, the performance of one test genotype VL 2041 was evaluated under restricted irrigation conditions (0,1 and 2 irrigation levels) against four checks [HPW 349(c), VL 907(c), HS 562(c), HF 507(c)] at five locations (Almora, Bajaura, Khudwani, Malan and Shimla). For pooled analysis, Khudwani centre data were not included due to incomplete data. The data presented in Fig. 1 showed that increasing irrigation levels significantly increased the grain yield. Maximum and significantly higher grain yield (41.16 q/ha) was obtained with two irrigations as compared with zero and one irrigations levels. All the check varieties were significantly superior to test entry VL 2041. Among check varieties, HS 562(C) produced significantly higher yield (40.48 q/ha) on mean basis. Irrigation level and genotypes interaction was non-significant for grain yield.

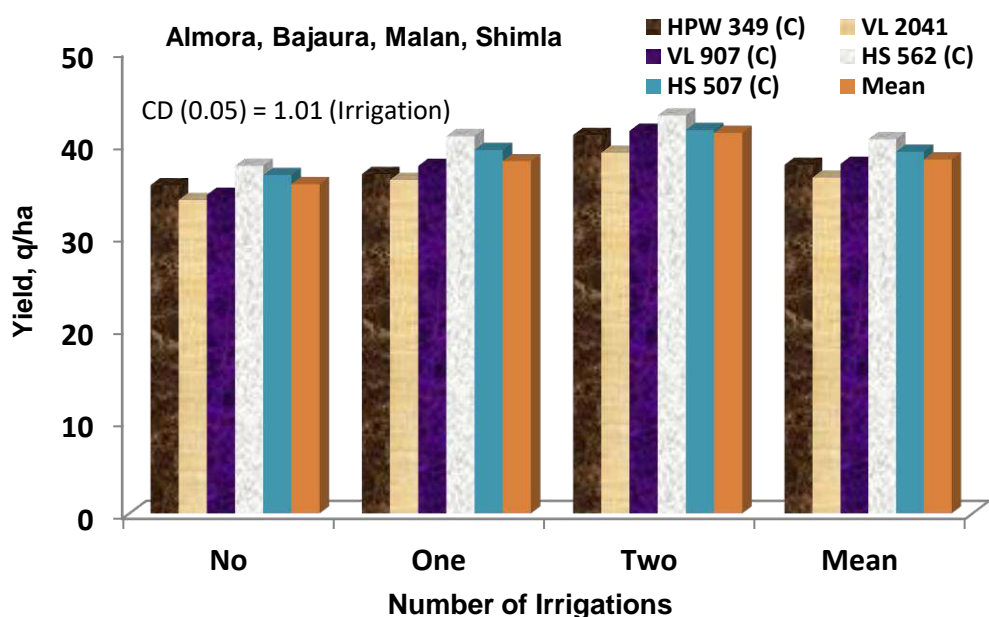


Fig. 1. Genotype performance under restricted irrigation conditions in NHZ

### North Western Plains Zone

The performance of test genotypes was evaluated under different sowing conditions, restricted irrigation conditions and at high fertility condition at different locations and the results are summarized here under;

### Irrigated Timely Sown

Two test entry, HD3406 and PBW826 were evaluated against four checks viz. HD2967(c), HD3086(c), DBW187(c) and DBW222(c) at nine locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana, Pantnagar and Sriganaganagar) under Timely (5th November to 11th November) and late (10th December to 16th December) sown conditions. For pooled analysis, Karnal and Pantnagar data were not considered due to low mean target yield. Timely sowing gave higher productivity of all genotypes compared to late sowing and on an average, yield declined by 21.5% when sowing was delayed from timely to late sowing circumstances (Fig. 2) The test entry PBW826 was found the top yielder (53.94 q/ha) and recorded significantly higher yield compared to other test entry HD3406 and all the checks.

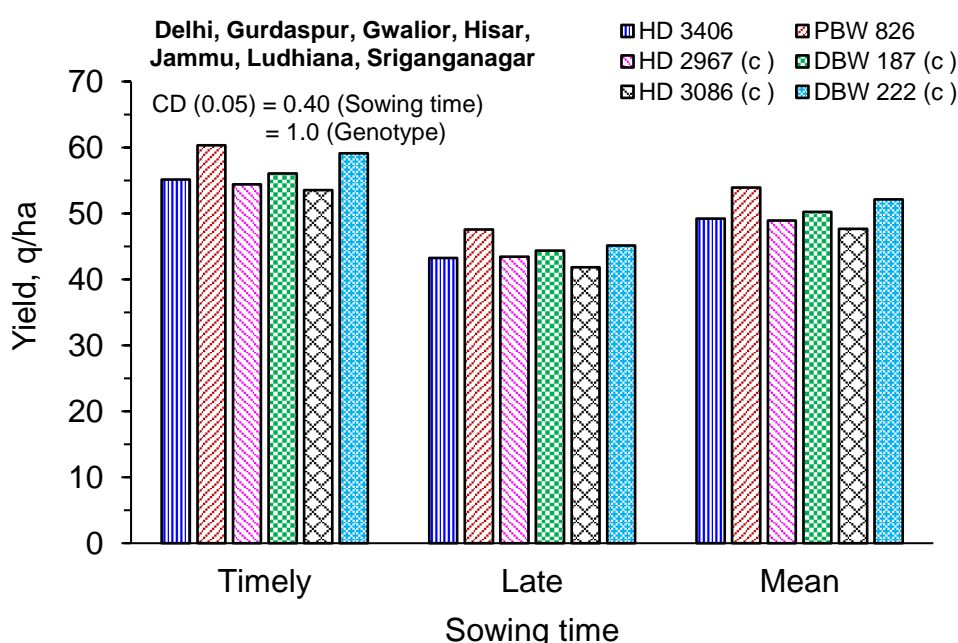


Fig. 2. Genotype performance under timely and late sown conditions in NWPZ

### Restricted Irrigation

The restricted irrigation trial was conducted with the objective to evaluate the three aestivum test entries namely HI1653, HI1654 and HD3369 against six checks [HD 3043(c), NIAW 3170(c), DBW 296(c), PBW 644(c), HI 1628 (c) and HUW 838(c)] at nine locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana, Pantnagar and Sriganaganagar). For pooled analysis, Karnal centre data were not included due to low mean yield and rest eight centre data were pooled for statistical analysis. The results revealed that the check entry HUW 838(c) produced significantly higher mean grain yield (45.27 q/ha) as compared to all test entries and other checks except test entry HI1654 (44.65q/ha) which was at par (Fig. 3).

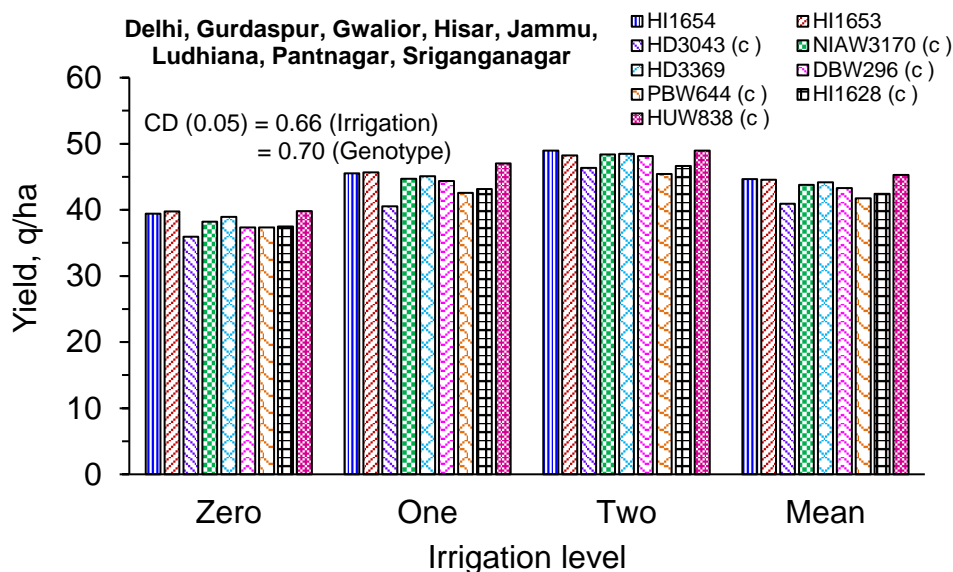


Fig. 3. Genotype performance under restricted irrigation conditions in NWPZ

### High Yield Potential Trial

This experiment was conducted at seven centres namely Delhi, Gurdaspur, Hisar, Karnal, Ludhiana, BISA Ladowal and Panthagar. For pooled analysis the data of Hisar and Karnal centres only were considered and rest five centre (Delhi, Gurdaspur, Ludhiana, BISA Ladowal and Panthagar) were rejected due to low mean yield (<65 q/ha) at highest fertility level. The pooled analysed data of two centres presented in Fig. 4 showed that grain yield enhanced significantly with increased fertiliser doses. Addition of 150% RDF and two sprays of growth retardants increased the grain yield (66.17 q/ha) significantly as compared to RDF (58.63 q/ha). This increase was to the tune of 12.9% over RDF. Genotype PBW872 ranked first on mean yield basis with yield of 67.73 q/ha, which was significantly higher than other genotypes. This genotype also yielded 70.85 q/ha under 150% RDF + 15 t FYM/ha + two sprays of growth regulators at first node and flag leaf stage which was higher than other varieties. High yield in PBW872 was due to its bolder grains (49.45g thousand grains weight). The second and third ranked high yielding genotypes were DBW371 (65.28 q/ha) and DBW327(c) (65.06 q/ha), respectively on mean yield basis.

### North Eastern Plains Zone

The performance of test genotypes was evaluated under different sowing conditions at different locations and the results are summarized here under;

#### Irrigated Timely Sown

Three test entries HD 3411, PBW 826 and HD 3406 were evaluated against five checks viz. HD 2967(c), HD 3086 (c), HD 3249 (c), HD 2733 (c) and DBW 187(c) at nine locations (Ayodhya, Coochbehar, Kalyani, Kanpur, Ranchi, RPCAU Pusa, Sabour, Shillongani and Varanasi) under timely (5th November to 11th November) and late (10th December to 16th December) sown conditions.

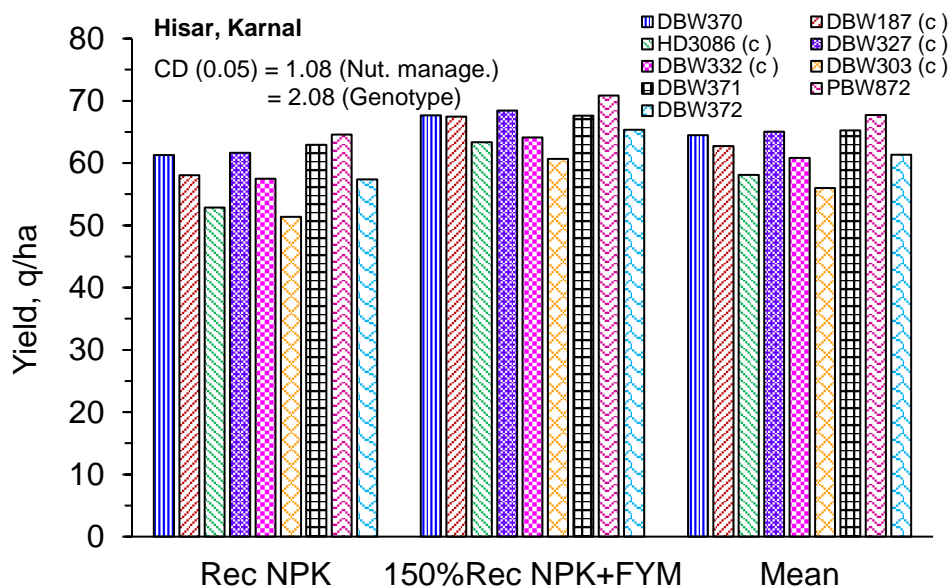


Fig. 4. Maximizing wheat productivity through fertilizer in NWPZ

The data of Ayodhya, Kalyani, Kanpur, RPCAU Pusa and Sabour were not considered for pooled analysis due to low mean yield (<45 q/ha under timely sown conditions). Timely sowing registered higher yield of all genotypes compared to late sowing and on mean basis, yield declined was 10.03% when sowing was delayed from timely to late sowing condition (Fig. 5). On mean basis, the check variety HD 2733 was the highest yielder (50.45 q ha<sup>-1</sup>) and recorded significantly higher grain yield compared to all checks except DBW 187 and one test entry PBW 826.

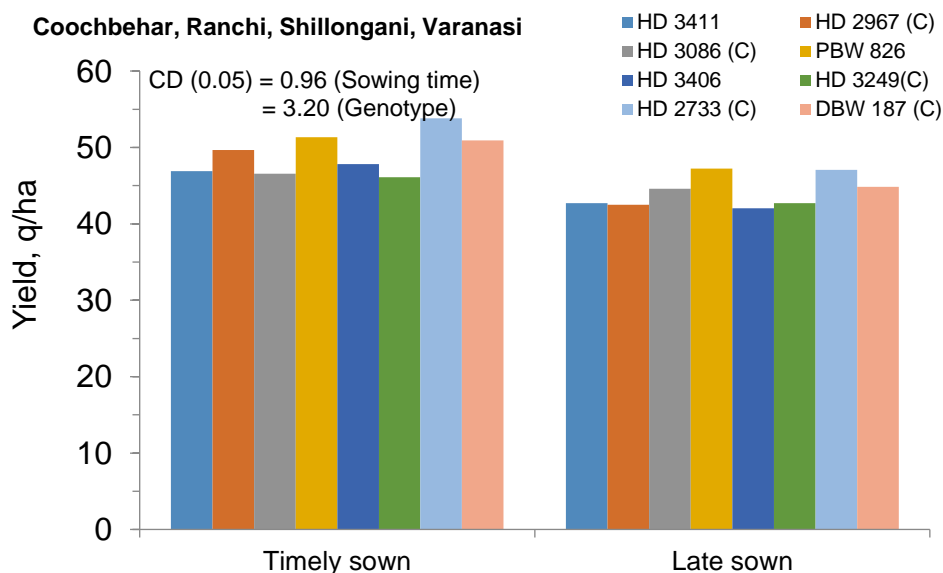


Fig. 5. Genotype performance under timely and late sown conditions in NEPZ

### Irrigated Late Sown

Three test entries DBW 316, PBW 833 and PBW 835 were evaluated against four checks viz. HI1563(c), HI1621 (c), HD3118 (c) and DBW 107(c) at nine locations (Ayodhya, Coochbehar,

Kalyani, Kanpur, Ranchi, RPCAU Pusa, Sabour, Shillongani and Varanasi) under late (10<sup>th</sup> December to 16<sup>th</sup> December) and very late (1<sup>st</sup> Jan. to 7<sup>th</sup> Jan.) sown conditions. The data of Kanpur and RPCAU Pusa were not considered in pooled analysis due to low mean target yield (<35 q/ha under late sown conditions). Late sowing registered higher yield of all genotypes compared to very late sowing and on mean basis, yield declined by 25.37% when sowing was delayed from late to very late sowing condition (Fig. 6). On mean basis, the test entry PBW 835 was the highest yielder (36.07 q ha<sup>-1</sup>) and was at par with all other test entries and checks.

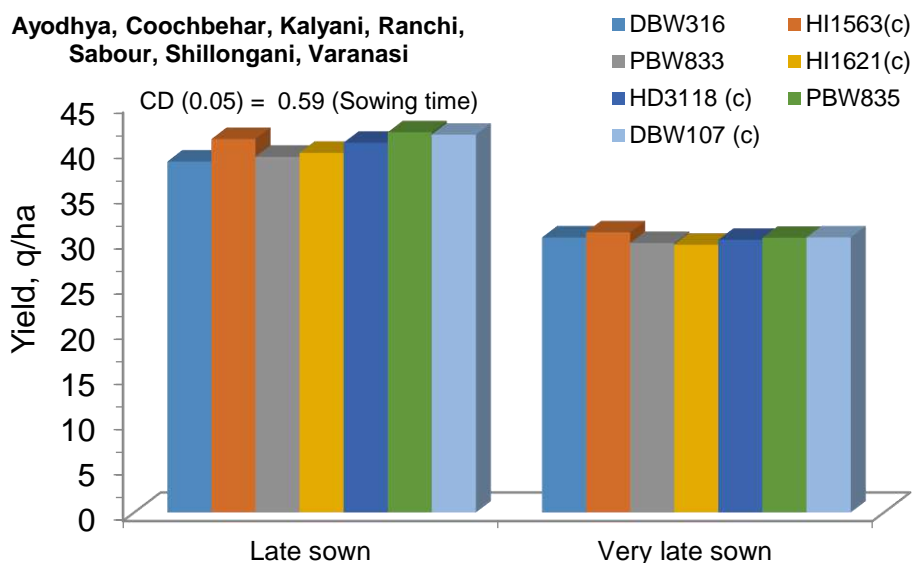


Fig. 6. Genotype performance under late and very late sown conditions in NEPZ

## CENTRAL ZONE

In this zone, the performance of test genotypes was evaluated under different sowing conditions and restricted irrigation conditions at different locations. High yield potential trial also conducted to maximize the wheat yield and the results are summarized here under:

### Irrigated Timely Sown

In irrigated timely sown conditions, three test entries (HI 1650, MACS 6768 and MP 3535) were evaluated against four check varieties (HI 1544, GW 322, GW 513 and HI 1636) at eight locations (Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur) under timely (12th November to 18th November) and late (03rd December to 09th December) sown conditions. The results showed significant effect of sowing time and genotypes on yield (Fig. 7). Timely sowing gave significantly higher productivity of all genotypes compared to late sowing and on an average yield decline by 11.16% when sowing was delayed by 15 days.

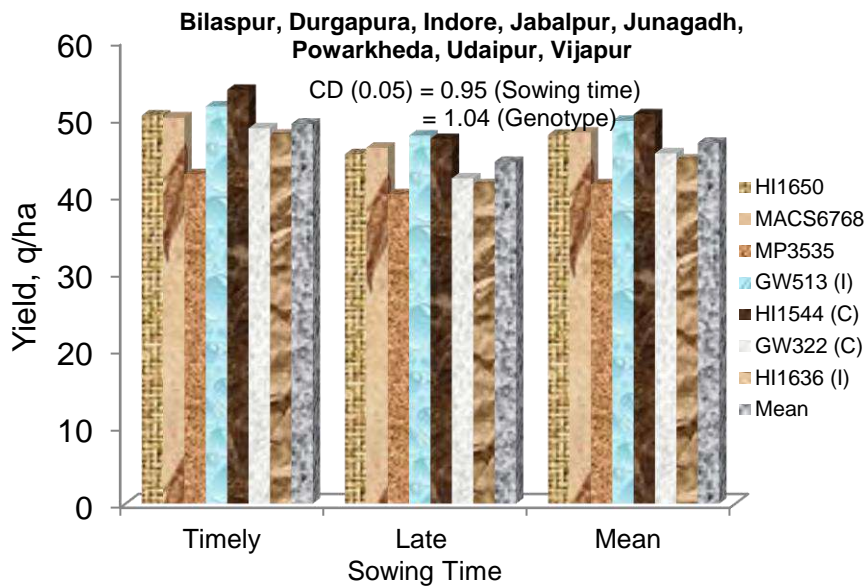


Fig. 7. Genotype performance under timely and late sown conditions in CZ

### Irrigated Late Sown

In irrigated late sown condition, one test entry HD 3407 was evaluated against five check varieties (HD2932, HI1634, MP3336, HD2864 and CG1029) at eight centres (Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur) under late (03rd December to 09th December) and very late (24th December to 31st December) sown conditions. The perusal of data showed significant effect of sowing time on yield (Fig. 8). On mean basis, there was significantly higher yield (33.31%) when crop sown under late sown conditions than very late sown condition. Test entry HD 3407 (41.61 q/ha) ranked 3rd which is statistically at par with check varieties CG 1029 (42.09 q/ha) and HD 2864 (41.86 q/ha).

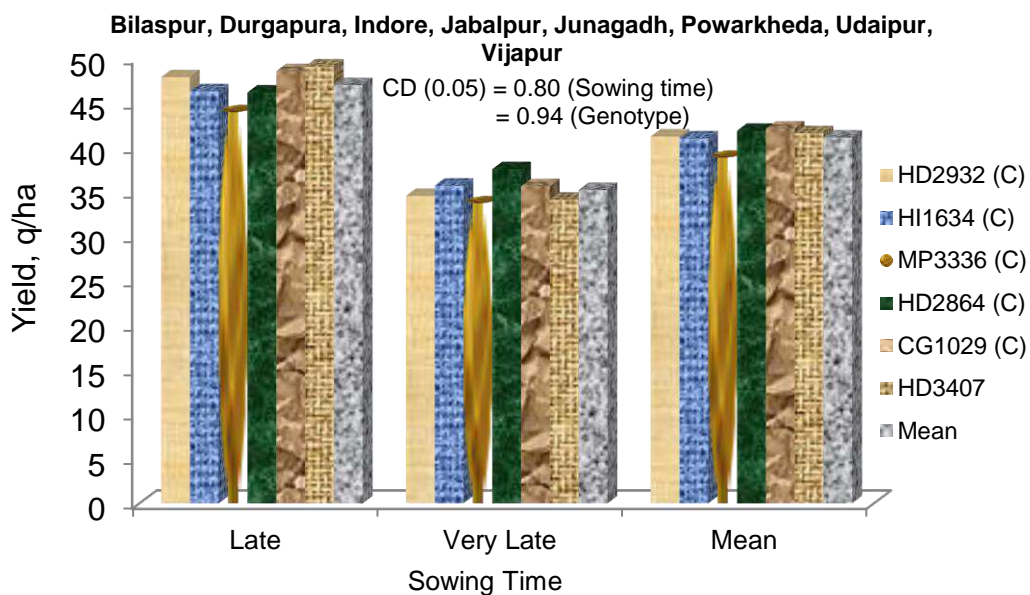


Fig. 8. Genotype performance under late and very late sown conditions in CZ

### Restricted Irrigation



In restricted irrigation trial, four test entries HI 1655, CG 1036, HI 8830 (d) and DDW 55 (d) were evaluated against five check varieties (MP 3288, DBW 110, HI 8627 (d), DDW 47 (d) and HI 8823) at six locations (Bilaspur, Durgapura, Indore, Jabalpur, Powarkheda and Udaipur). For pooled analysis, data of Durgapura centre were not included due to low mean target yield and the data of Udaipur centre were not included in pooled analysis due to improper data reporting. The pooled analysis showed that successively increase in number of irrigations produced significantly higher yield (Fig. 9). Maximum and significantly higher yield (38.77 q/ha) was obtained with two irrigations as compared with zero and one irrigations. The check variety DBW 110 ranked 1st (38.43 q/ha) followed by test entry CG 1036 (38.33 q/ha) and HI 8830 (d) (38.11 q/ha) and these three genotypes remained statistically at par on mean basis.

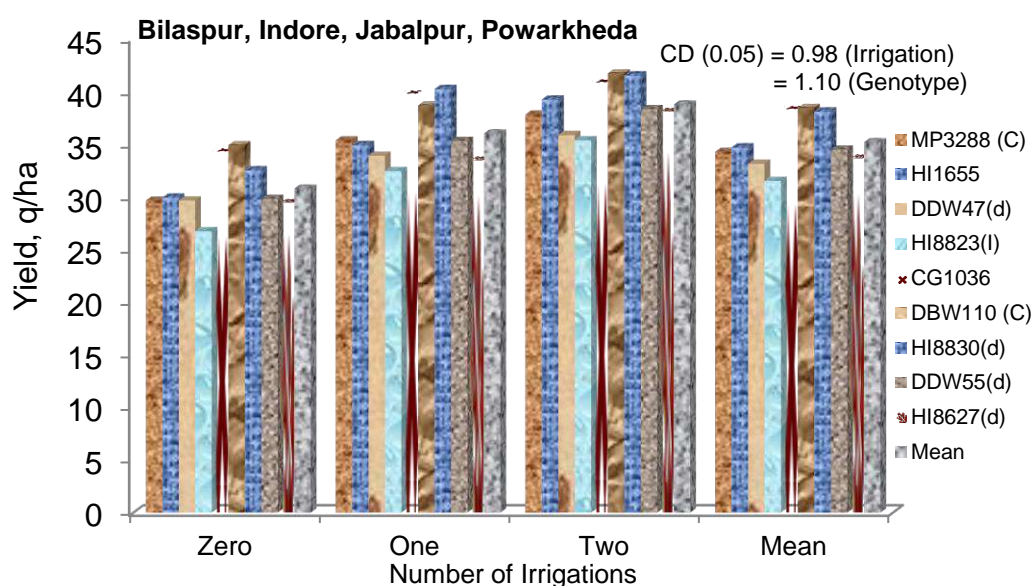


Fig. 9. Genotype performance under restricted irrigation conditions in CZ

### High Yield Potential Trial

The trial was conducted at five centres namely BISA Jabalpur, Jabalpur, Powarkheda, Udaipur and Vijapur. The pooled analysis showed significant effect of fertiliser application and growth regulators on yield (Fig. 10). Addition of 15 t FYM/ha with 150% RDF significantly increased the grain yield (11.09%) over RDF. Genotype GW322 remained top yielder (68.04 q/ha) followed by DBW 303 (66.68 q/ha) and both genotype remained at par but significantly higher than other genotypes.

### Peninsular Zone

In Peninsular zone, the performance of test genotypes was evaluated under two trials on sowing time (timely & late, and late & very late sown) at different locations. The results of these trials are summarized below.

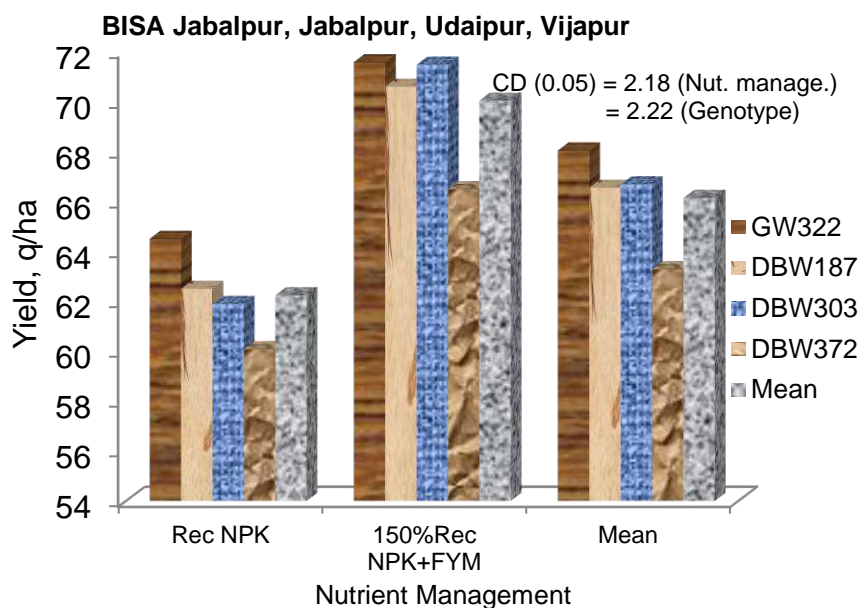


Fig. 10. Maximizing wheat productivity through fertilizer in CZ

### Irrigated Timely Sown

In irrigated timely sown trial, the performance of two *durum* test entries (MACS4100, HI8826) over 3 check varieties (MACS3949, DDW48 and GW322) was evaluated under timely and late sown conditions at four locations *i.e.* Akola, Dharwad, Niphad and Pune. The perusal of pooled data of Akola and Niphad indicated that grain yield marginally reduced without a significant difference in changing of sowing from timely to late condition (Fig. 11). The mean grain yield under time and late sowing conditions was recorded to be 55.76 and 53.13 q/ha, respectively. Under timely sowing condition, test entry HI 8826 (63.01 q/ha) yielded exceedingly well as compared to best check variety MACS3949 (55.97 q/ha). The mean yield of HI8826(d) under timely sown condition was 12.58% higher than the yield of best check MACS3949.

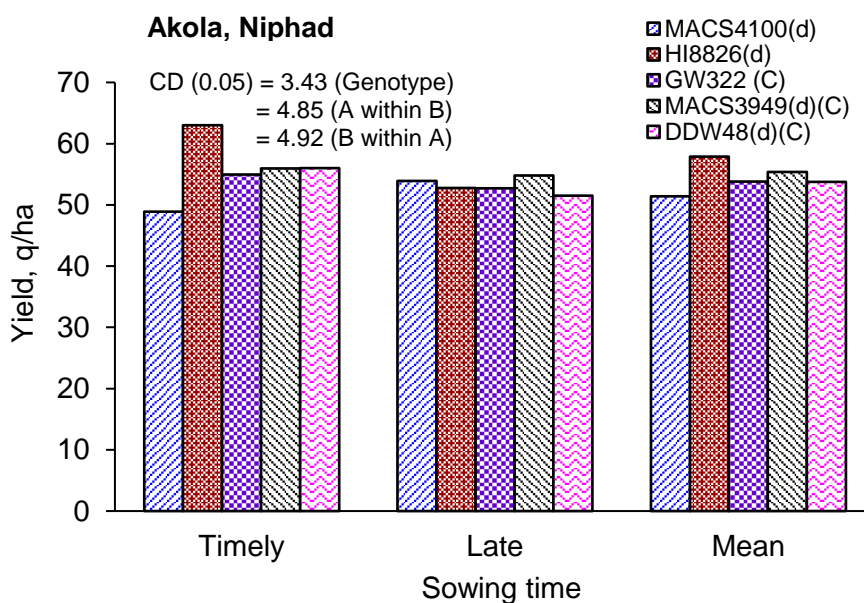


Fig. 11. Genotype performance under timely and late sown conditions in PZ

### Irrigated Late Sown

In irrigated late sown trial, the performance of one *aestivum* test entry DBW320 vis-à-vis four *aestivum* checks (HD3090, HI1633, HD2932, RAJ4083) was evaluated under late and very late sowing conditions at four centres (Akola, Dharwad, Niphad and Pune). The results of pooled data of Akola, Niphad and Pune centres revealed that grain yield declined drastically on shifting the sowing time from late to very late condition (Fig. 12). The mean grain yield under late and very late condition was observed to be 55.53 and 41.68 q/ha, respectively. In late as well as very late sown condition, the yield of test genotype DBW320 was lesser than those of best check variety HD2932.

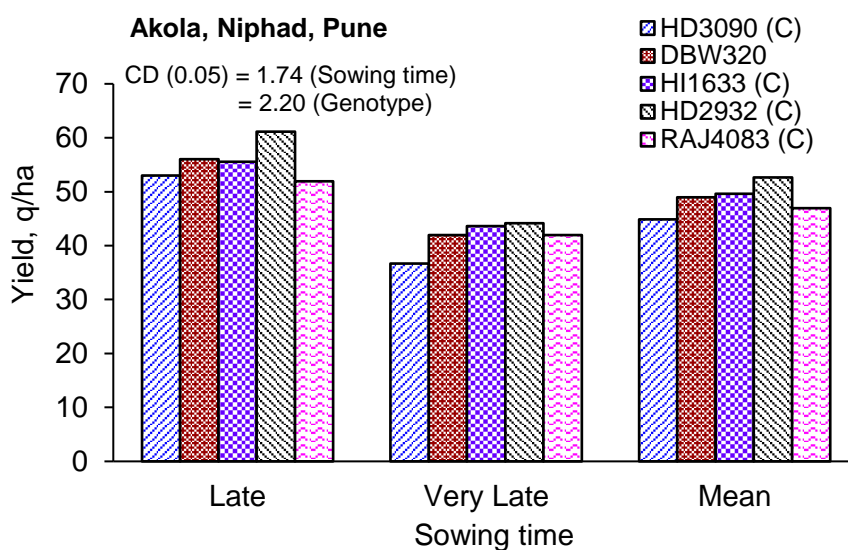


Fig. 12. Performance of genotypes under late and very late sown conditions in PZ

### PRODUCTION TECHNOLOGIES

In this section, the results of various experiments on updating the package of practices of various wheat growing zones are presented. Various special coordinated trials on weed control, nano urea, NPK solubilizing microbial consortium, maximizing production, use of sea-weed extract, use of RCTs in soybean-wheat system, lodging management, biofortification, fertigation in wheat were conducted to address the various issues in different wheat growing zones of the country.

#### SPL -1: Efficacy of herbicides against diverse weed flora of wheat

Weeds are major problem in wheat production. Chemical weed control is preferred over other weed control methods in wheat. Moreover, wheat is infested with diverse weed flora and for control of complex weed flora herbicide combinations are required. Therefore, keeping these in view an experiment involving twelve weed control treatments was conducted across zones at 17 locations.

In NHZ, this trial was conducted at two locations (Bajaura and Malan). The pooled analysed of yield data of two centres are presented in Fig. 13(a). The minimum wheat grain yield (31.83 q/ha) was recorded with untreated weedy control on pooled basis. Among herbicide treatments, the maximum grain yield was recorded with pre em. tank mix combination of pendimethalin + pyroxasulfone at 1250 + 127.5 g/ha (Fig. 13(b)). Among herbicide treatments, at Malan, EPOST application of Pyroxasulfone + metsulfuron @ 127.5 + 4 g/ha recorded the lowest weed density and dry weight. Whereas, at Bajaura, pendimethalin at 1500 g/ha recorded the lowest weed density and dry weight.

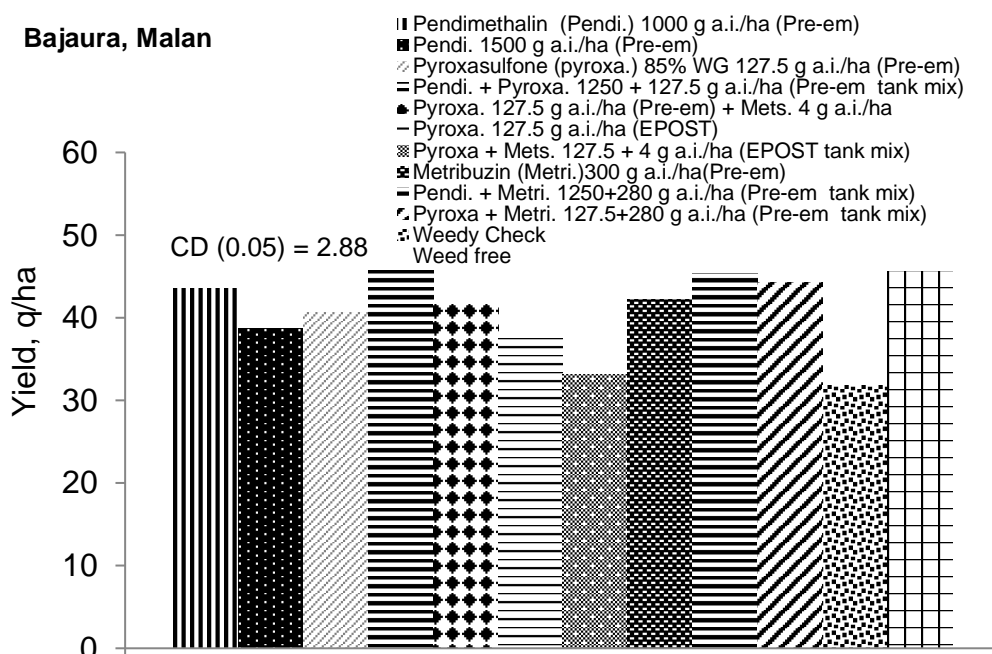


Fig. 13(a). Grain yield of wheat under different herbicides application in NHZ

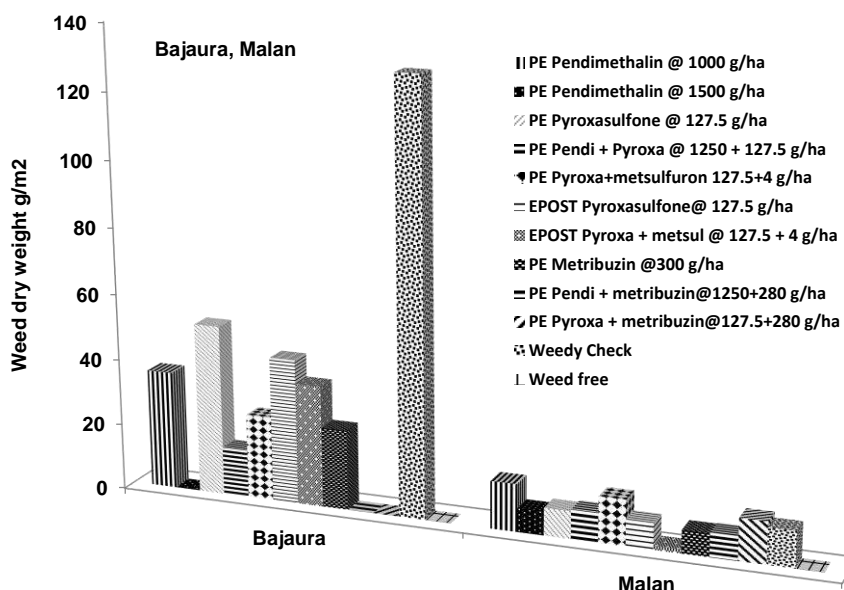


Fig. 13(b). Efficacy of herbicides against diverse weed flora of wheat in NHZ

In NWPZ, this trial was conducted at three centres namely Gurdaspur, Hisar and Jammu. The analysis of pooled data as shown in Fig. 14(a) and (b) revealed that herbicide application produced significant effect on grain yield and yield attributes. The highest yield was obtained under weed free situation (51.93 q/ha) which might be attributed to higher and better use of moisture, light, nutrients and space by the crop plants. Among herbicides, pre-emergence application of pyroxasulfone + metribuzin 127.5+280 g a.i./ha showed the least number of weed (16.9) and weed dry weight (15.4 g/ sq. m.) at 90 DAS as compared to values of these traits as 112.6 and 161.5, respectively, under weedy check condition followed by pre-emergence tank mix application of pendimethalin + metribuzin at 1280 + 280 g a.i./ha has resulted into less weed count (19.3) and reduced weed dry weight (21.1 g/sq. m.) at 90 DAS.

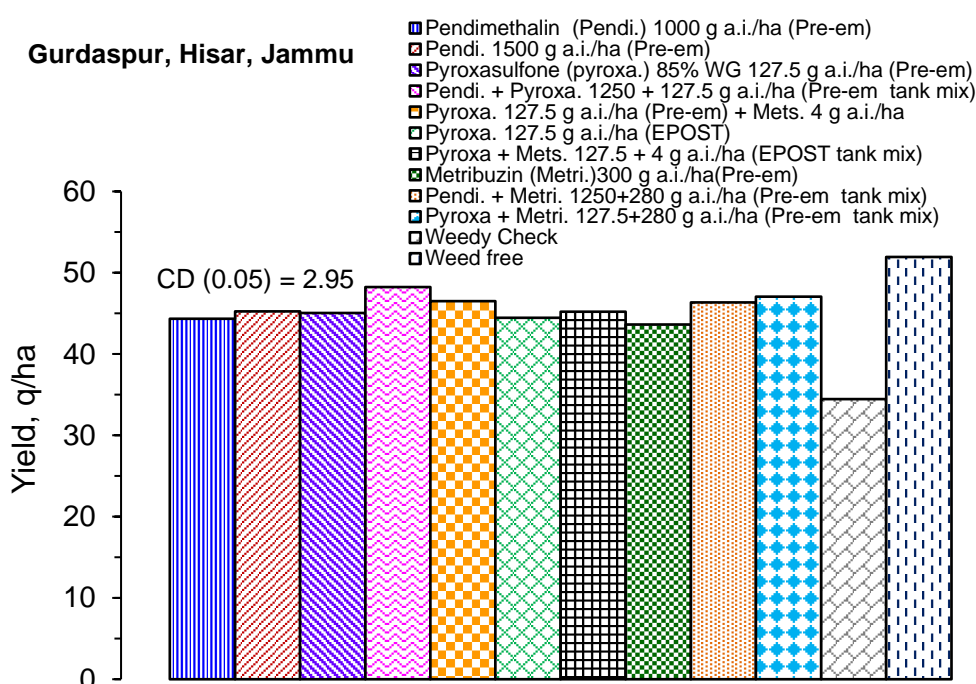


Fig. 14(a). Grain yield of wheat under different herbicides application in NWPZ

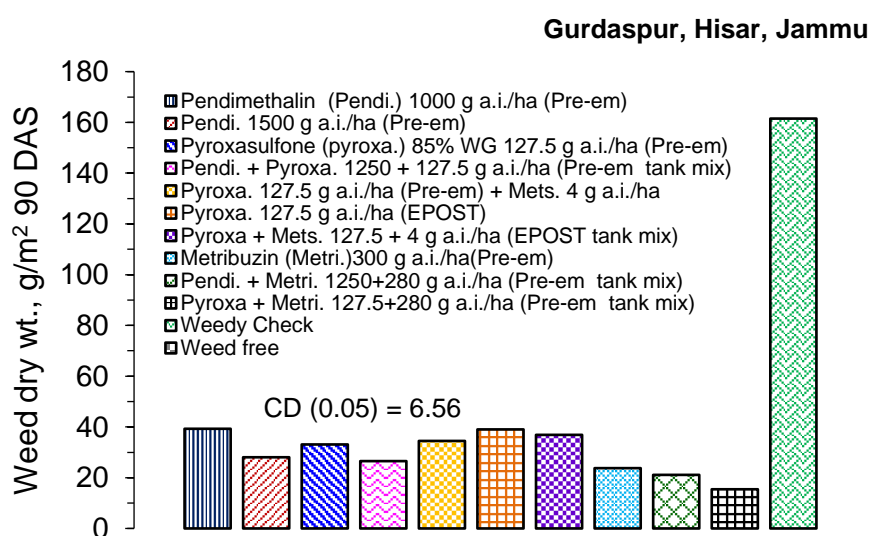


Fig. 14(b). Efficacy of herbicides against diverse weed flora of wheat in NWPZ

In NEPZ, this experiment was conducted at four locations (Ayodhya, Ranchi, RPCAU PUSA and Shillongani). The maximum grain yield (49.2 q/ha) was obtained in weed free condition which was at par to pre-emergence tank mix application of Pendimethalin + metribuzin @1250+280 g a.i./ha, Pre-emergence tank mix application of Pyroxasulfone + metribuzin @127.5+280 g a.i./ha and early post emergence tank mix application of Pyroxasulfone+ metsulfuron @ 127.5 + 4 g a.i./ha {Fig. 15(a) and (b)}. The yield gain in weed free condition over weedy check was 56.7 %. The weed count and weed dry weight was reduced significantly by pre-emergence tank mix application of Pyroxasulfone + metribuzin @127.5+280 g a.i./ha and pre-emergence tank mix application of Pendimethalin + metribuzin @1250+280 g a.i./ha at all growth stages.

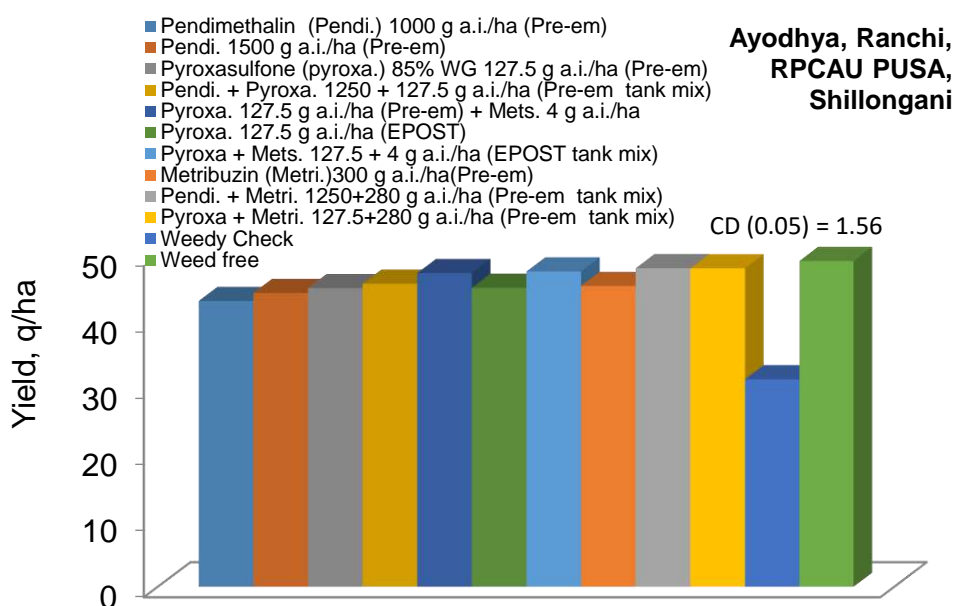


Fig. 15 (a). Grain yield of wheat under different herbicides application in NEPZ

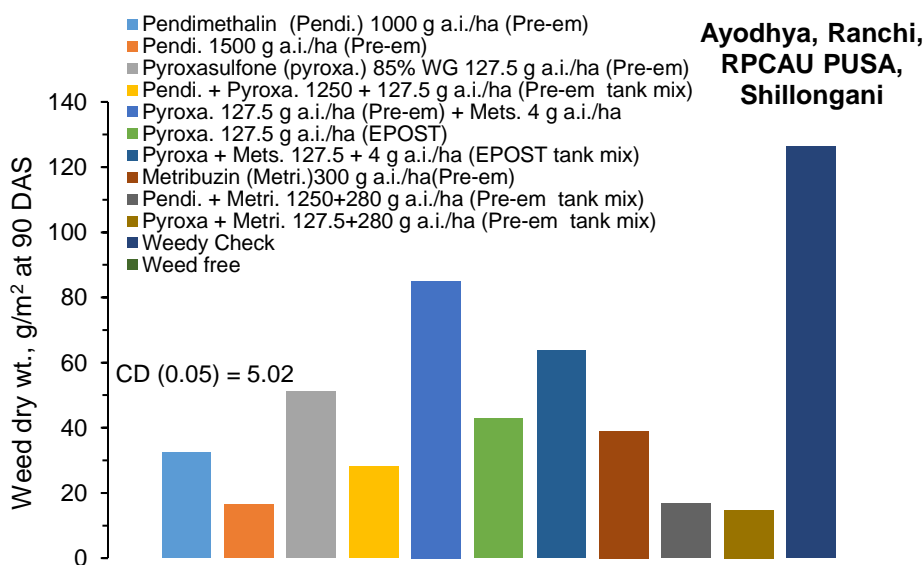


Fig. 15(b). Efficacy of herbicides against diverse weed flora of wheat in NEPZ

In CZ, this trial was conducted at six locations (Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore). The pooled analysis of data {Fig. 16(a) and (b)} revealed that treatment having EPOST tank mix application of Pyroxasulfone + metsulfuron @127.5 + 4 g a.i./ha produced significantly higher grain yield (52.30 q/ha), thousand grains weight (47.33, g) and earhead/m<sup>2</sup> (387), stand count (161) as compared other treatments.

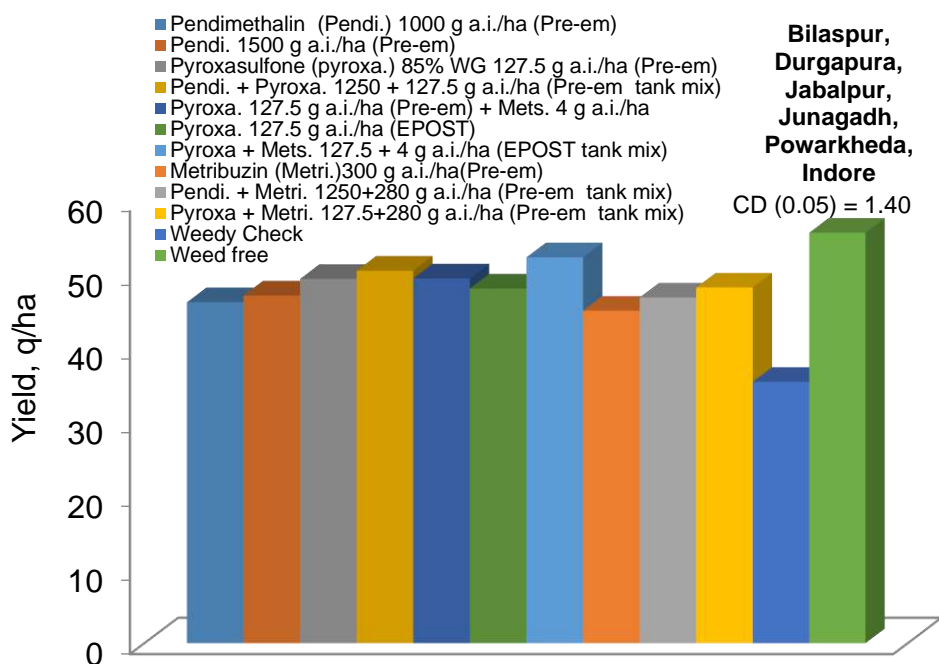


Fig. 16(a). Grain yield of wheat under different herbicides application in CZ

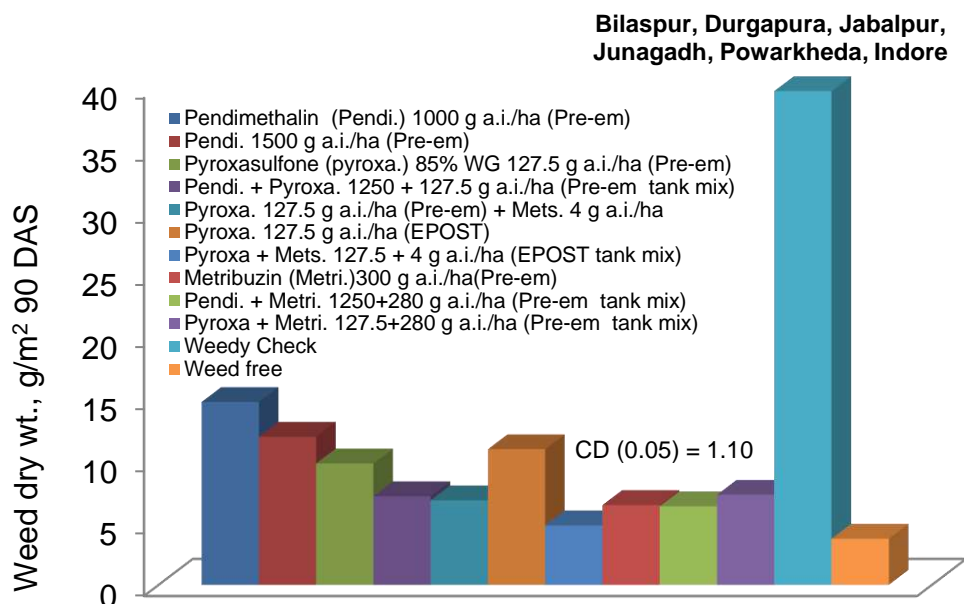


Fig. 16(b). Efficacy of herbicides against diverse weed flora of wheat in CZ

In PZ, this trial was conducted at Dharwad and Pune centres. The results of pooled data are presented in Fig. 17(a) and (b). It was observed that herbicide application produced effect on

grain yield which was found maximum (52.20 q/ha) under weed free conditions. In terms of herbicide performance, pre-emergence application of pendimethalin @1500 g a.i./ha resulted into minimum weed count (7.03) and weed dry weight (5.25 g/sq.m.) at 90 DAS over weed count (22.08) and weed dry weight (21.55 g/sq.m.) at 90 DAS, respectively, under weedy check condition.

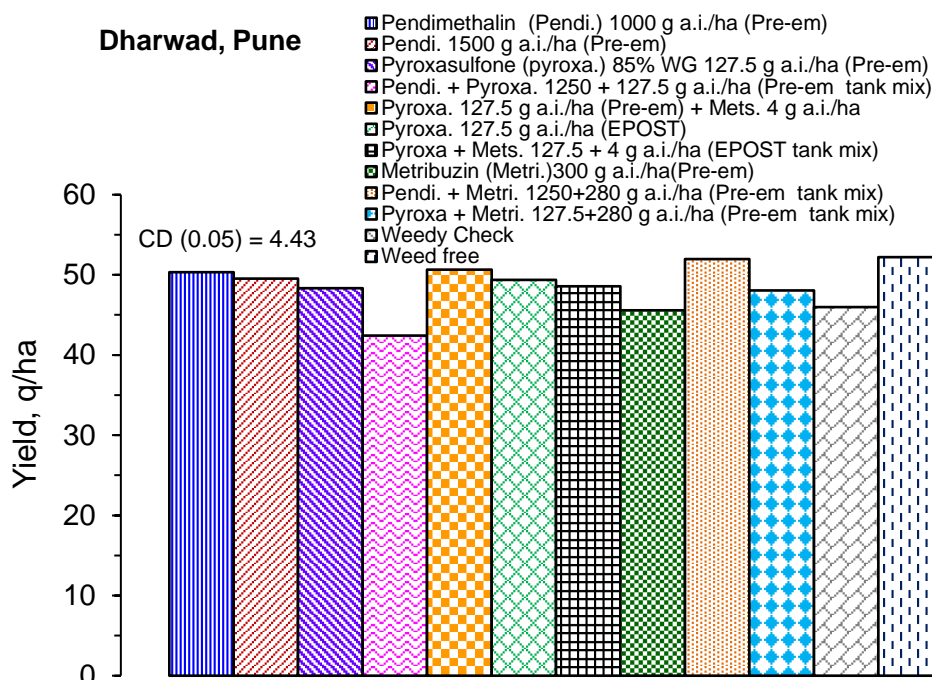


Fig. 17(a). Grain yield of wheat under different herbicides application in PZ

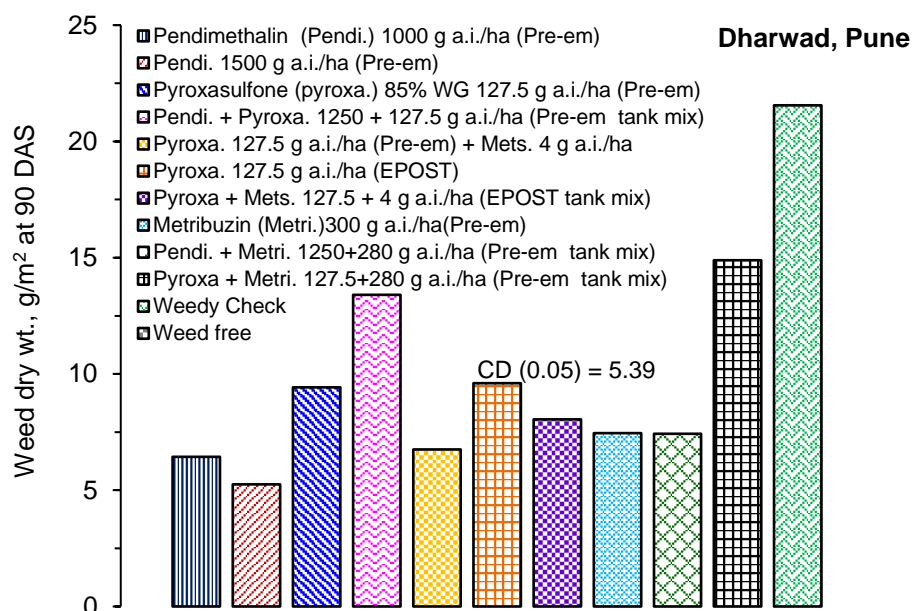


Fig. 17(b). Efficacy of herbicides against diverse weed flora of wheat in PZ



## SPL-2: Sea weed extract usage in wheat

In NHZ, this experiment was conducted at two locations (Bajaura and Malan). The perusal of pooled data presented in Fig. 18 revealed that maximum wheat grain yield (47.56 q/ha) was obtained in treatment where wheat seeds were treated with sea weed extract followed by two foliar spray of sea weed extract 4ml/litre of water at tillering and heading. This treatment resulted in higher yield due to better earhead density (422/sq.m.), heavier grains weight (43.55 g/1000 grains weight), more number of grains per earhead (26.22) and the highest biomass production (107.48 q/ha). Seed treatment with sea weed extract at the rate of 3.0 ml per kg of weed seed before sowing of the crop also resulted in significantly higher grain and biomass yield (Table 6.2) as compared to control (without seed treatment).

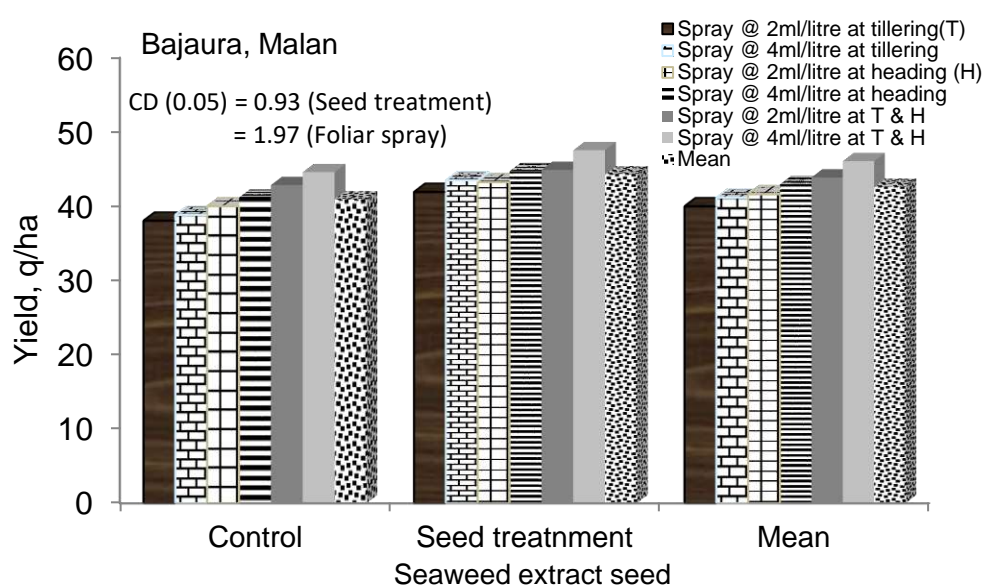


Fig. 18. Effect of seaweed extract on wheat productivity in NHZ

In NWPZ, the experiment on seaweed extract was conducted at three locations (Delhi, Gurdaspur and Jammu). The perusal of pooled analysis data presented in Fig. 19 showed that seed treatment with seaweed extract made significant increase in grain yield (51.65 q/ha) over untreated control (50.92 q/ha). The maximum mean grain yield (53.18 q/ha) was observed with two foliar spray of seaweed extract using 4 ml/lit dose at tillering and heading stages followed by two foliar spray of seaweed extract using 2 ml/lit dose at tillering and heading stages (52.13 q/ha).

In NEPZ, this experiment was conducted at four locations (Coochbehar, Ranchi, Sabour, and Varanasi). There was non-significant effect of seed treatment and foliar application on the grain yield (Fig. 20). The maximum grain yield (48.66 q/ha) was obtained by foliar application of seaweed extract @ 4ml/litre water at tillering stage.

**Delhi, Gurdaspur, Jammu**

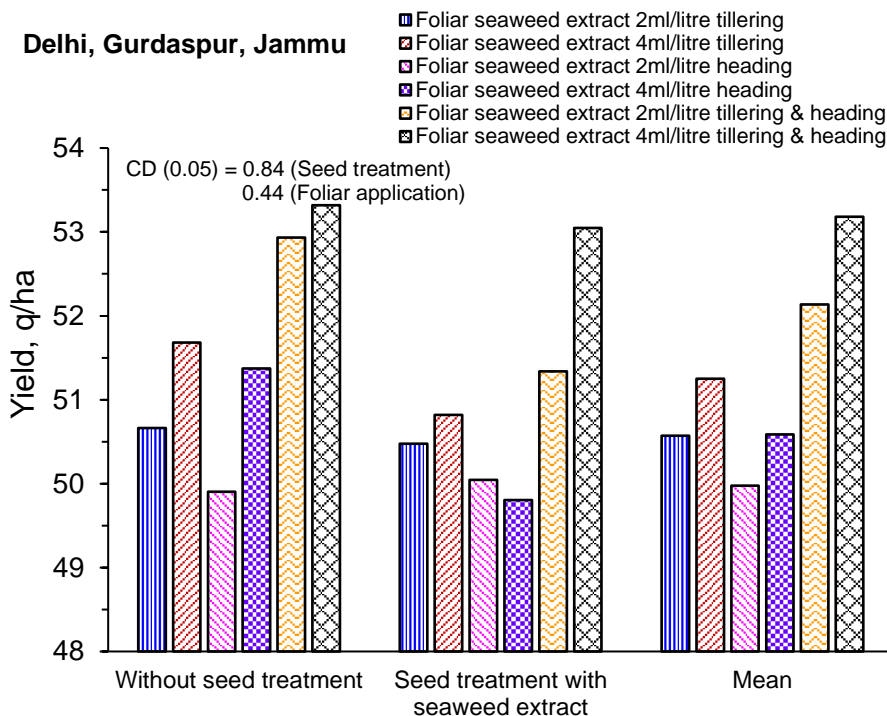


Fig. 19. Effect of seaweed extract on wheat productivity in NWPZ

**Coochbehar, Ranchi, Sabour, Varanasi**

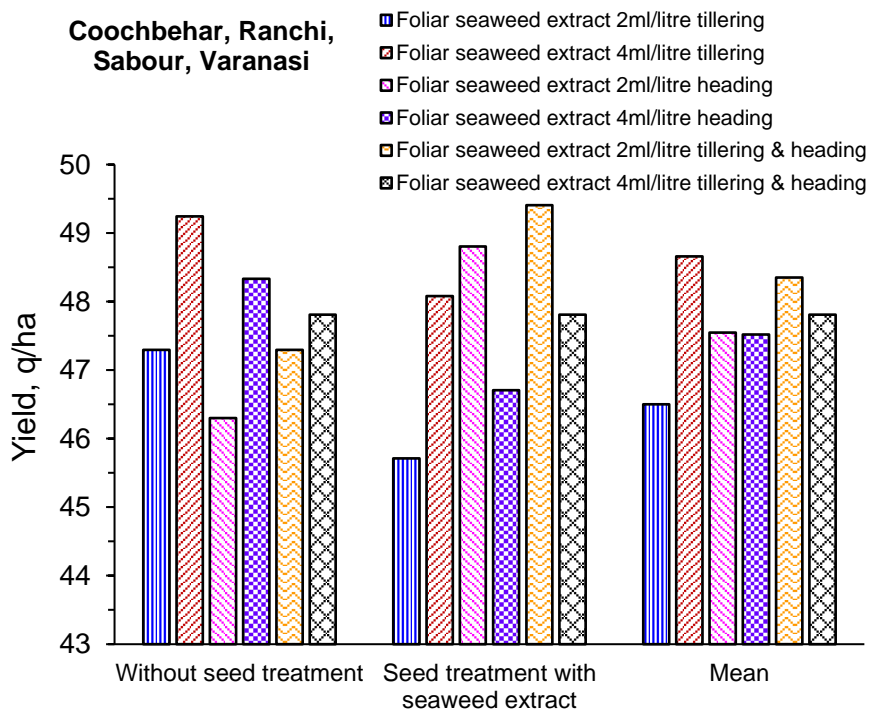


Fig. 20. Effect of seaweed extract on wheat productivity in NEPZ

In CZ, this trial was conducted at three locations (Dhanduka, Durgapura and Udaipur) and perusal of pooled data (Fig. 21) revealed that maximum grain yield (52.42 q/ha) was recorded in treatment foliar application of seaweed extract @ 4ml/litre water at tillering & heading treatment which was significantly higher than all other treatments followed by foliar application of seaweed extract @ 2ml/litre water at tillering & heading stage (49.91 q/ha).

Seed treated with seaweed extract also produce significantly higher grain yield (45.91 q/ha) than untreated seed (42.13 q/ha).

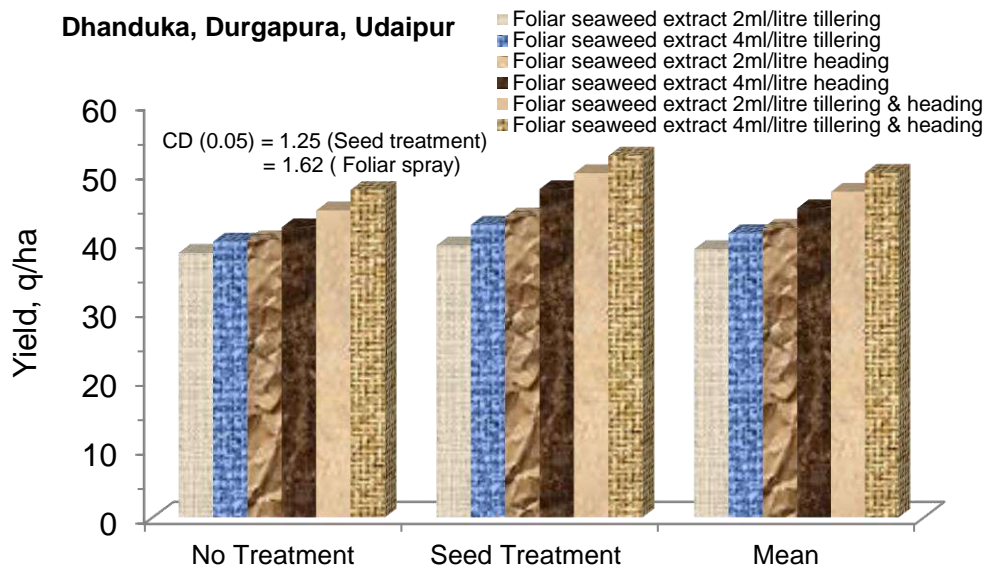


Fig. 21. Effect of seaweed extract on wheat productivity in CZ

In PZ, this experiment was conducted at Akola, Dharwad and Niphad centres. The results of pooled data revealed that seed treatment and foliar application of seaweed extract had significant effects on wheat yield (Fig. 22). The maximum wheat yield of 44.68 q/ha was observed with seed treatment and foliar application of seaweed extract @4ml/litre water at tillering stage.

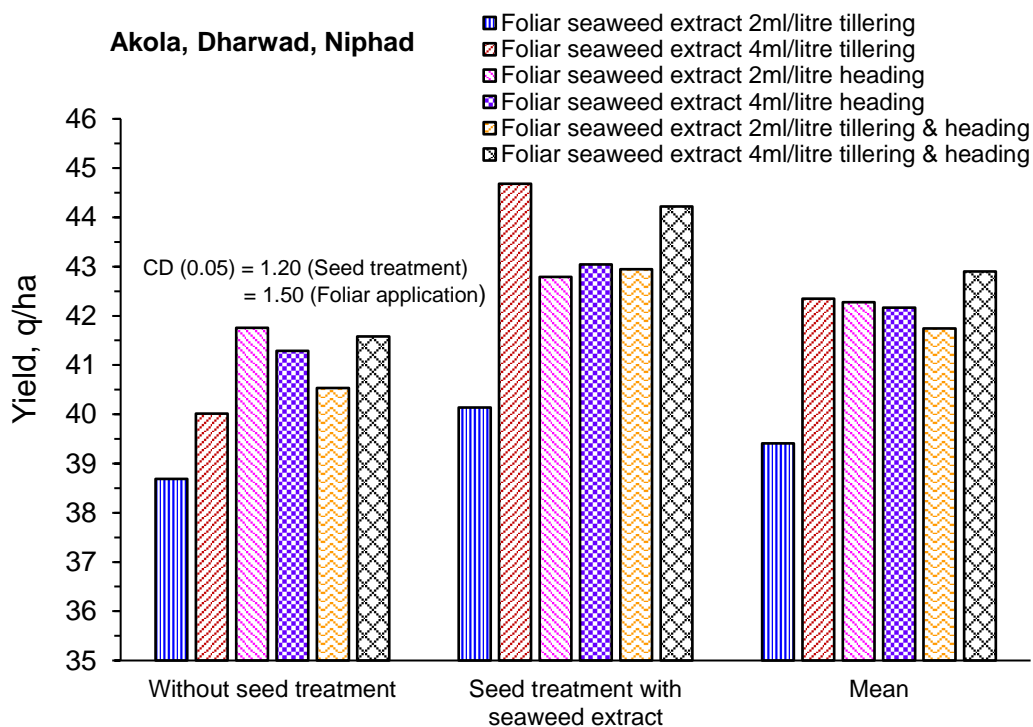


Fig. 22. Effect of seaweed extract on wheat productivity in PZ

### SPL- 3: Effect of nano urea under irrigated conditions

This experiment was conducted to explore the possibility of maximizing wheat productivity by integrated use of nano urea. The experiment was laid out in randomised complete block design with thirteen treatments viz. control (No N) and 50, 75 and 100% of Rec N rates along with either one or two spray of nano urea or two spray of simple urea (5%). One third nitrogen as per treatment, full phosphorus and potash as basal dose and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation were applied. Irrigation and weed control measures were followed as per recommended package of practices for the concerned zone.

In NHZ, this experiment was conducted at Almora centre only. The data are presented in Fig. 23 showed that the lowest grain yield (24.52 q/ha) was recorded in no N application control treatment. In comparison to control, all the treatments caused significant yield improvement. No specific trend with regards to nano urea applications was observed.

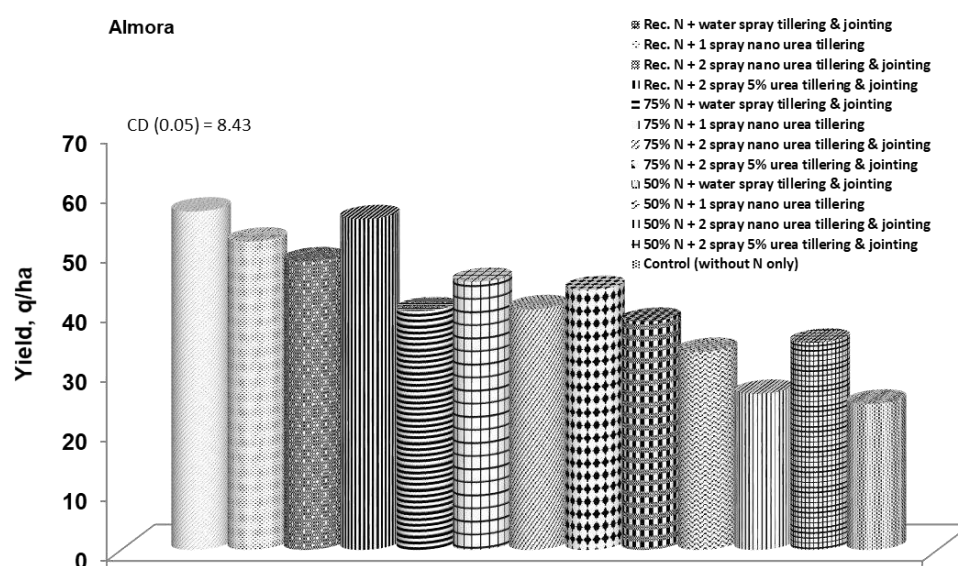


Fig. 23. Effect of nano urea on productivity of wheat in NHZ

In NWPZ, this experiment was conducted at eight locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana and Pantnagar). The perusal of pooled analysis data presented in Fig. 24 showed that application of recommended N and two spray of nano urea at tillering and jointing stage produced the maximum grain yield of 50.52 q/ha. However, the grain yield with rec. N + two spray of simple urea (5%) at tillering and jointing stage (49.45 q/ha) and with rec. N + one spray of nano urea at tillering (49.26 q/ha) were at par with rec. N + two sprays of nano urea. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization brought about an increase of 6.38% in grain yield over rec. N treatment. The yield gain might be due to

the bolder grains with thousand grains weight of 38.16 g in nano urea spray against 36.93 g for recommended dose of N fertilizer without any spray.

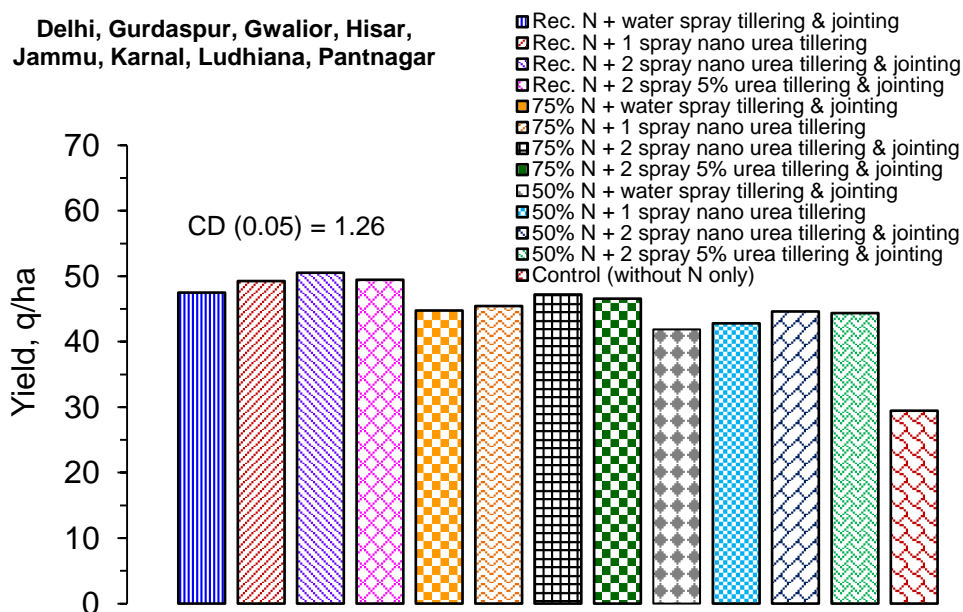


Fig. 24. Effect of nano urea on productivity of wheat in NWPZ

In NEPZ, this experiment was conducted at five locations (Burdwan, Coochbehar, Ranchi, Sabour and Varanasi). The maximum grain yield (48.23 q/ha) was obtained under recommended N Dose+ two spray of nano urea at tillering & jointing stage treatment, which was at par to recommended N Dose + water spray at 45 & 65 Days after sowing, recommended N Dose+ one spray of nano urea at tillering and recommended N Dose+ two spray of urea (5%) at tillering & jointing and was significantly superior to all other treatments (Fig. 25).

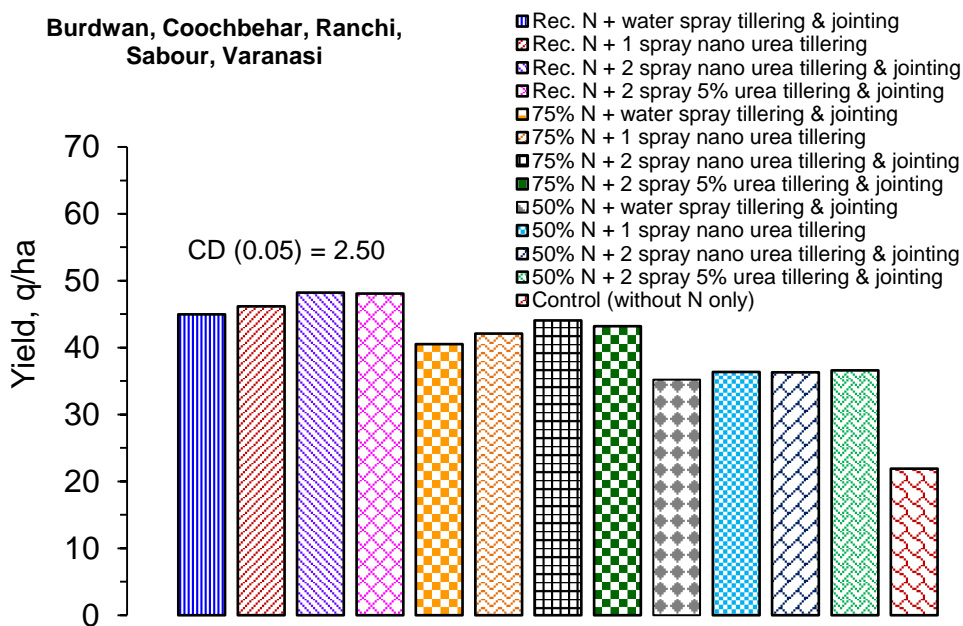


Fig. 25. Effect of nano urea on productivity of wheat in NEPZ

In CZ, this trial was conducted at seven locations (Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore, Vijapur). The experiment was conducted with thirteen N treatment combinations in three replications. The pooled analysis of data (Fig. 26) revealed that maximum grain yield (54.02 q/ha) was produced in the treatment of rec. N+ two spray of nano urea at tillering and jointing, followed by rec. N+ two spray of urea (5%) at tillering and jointing (53.13 q/ha) and rec. N+ one spray of nano urea at tillering (52.34 q/ha) and all the three treatments were found statistically at par.

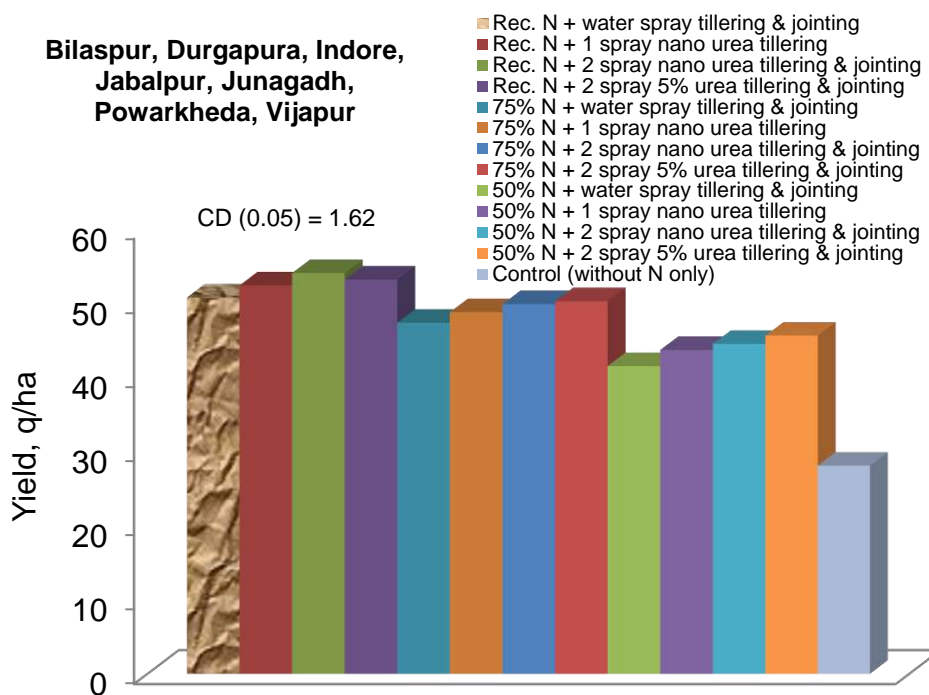


Fig. 26. Effect of nano urea on productivity of wheat in CZ

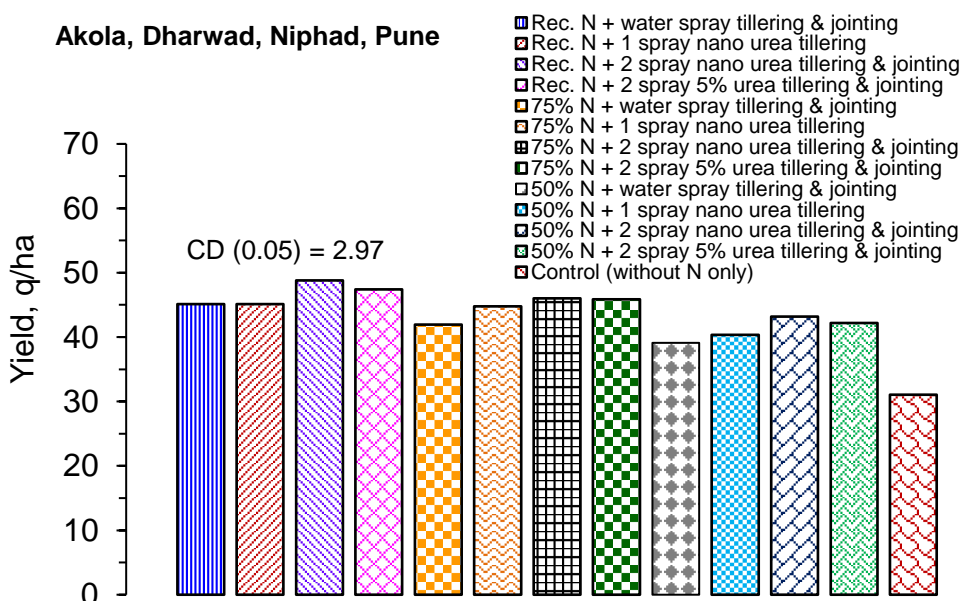


Fig. 27. Effect of nano urea on productivity of wheat in PZ

In PZ, this experiment was conducted at Akola, Dharwad, Niphad and Pune centres. The results of pooled data presented in Fig. 27 shows that the maximum grain yield of 48.78 q/ha was found with the application of recommended N and two spray of nano urea at tillering and jointing stage. However, the treatment of two spray of urea (5%) at tillering and jointing stage also produced the statistically similar yield. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization increased the grain yield by 8.14% as compared to base treatment (rec. N only).

#### SPL- 4: Effect of nano urea under restricted irrigation conditions

In NHZ, this trial was conducted at one location namely Bajaura The data presented in Fig. 28 clearly revealed that significantly highest wheat grain yield (54.24 q/ha) was obtained by applying recommended dose of N along with spray of urea (5%) + nano urea at tillering stage. The minimum grain yield (20.45 q/ha) was recorded in absolute control (No nitrogen). Compared to control treatment, application of two spray of nano urea alone at tillering and jointing significantly increased the grain yield (26.18 q/ha). Also, compared to recommended N, one or two spray of either nano urea or urea significantly improved the grain yield.

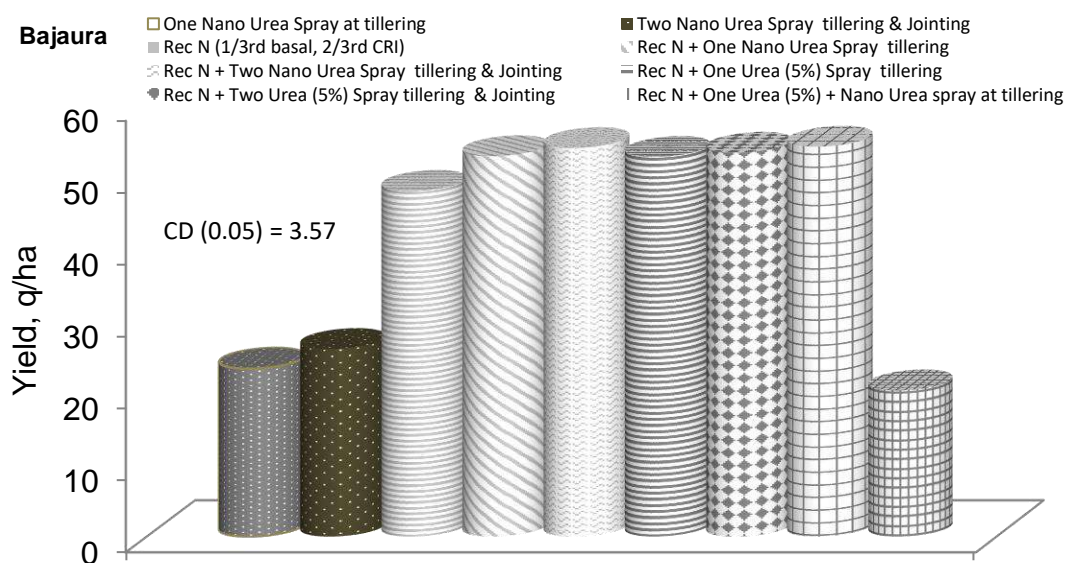


Fig. 28. Effect of nano urea on wheat productivity under restricted irrigation in NHZ

In NWPZ, this experiment was conducted at four locations (Gwalior, Hisar, Karnal and Pantnagar). The perusal of pooled analysis data presented in Fig. 29 showed that application of recommended N and two spray of nano urea at tillering and jointing stage produced the maximum grain yield of 47.70 q/ha followed by recommended N and one spray of 5% urea + one spray of nano urea at tillering stage (47.11 q/ha) which was at par with former. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization recorded an increase of 4.88% in grain yield over rec. N treatment.

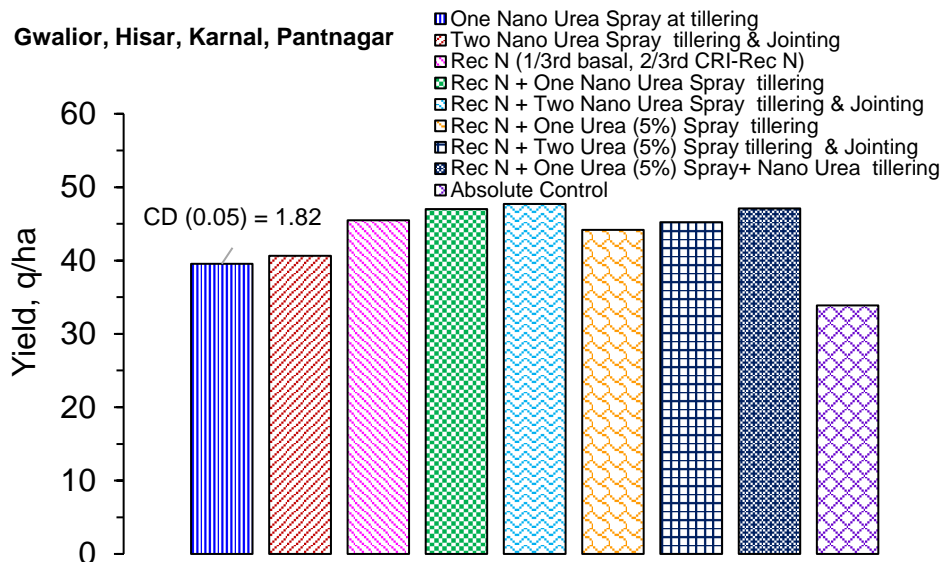


Fig. 29. Effect of nano urea on wheat productivity under restricted irrigation in NWPZ

In NEPZ, this experiment was conducted at five locations (Ayodhya, Burdwan, Kanpur, RPCAU PUSA and Shillongani). Burdwan centre was excluded due to very low yield. The maximum grain yield (45.8 q/ha) was obtained under recommended N + one spray of urea (5%) + nano urea at tillering (40-45 DAS), which was at par to recommended N + two sprays of urea (5%) at tillering (40-45) and jointing (60-65 DAS) and was significantly superior to all other treatments (Fig. 30).

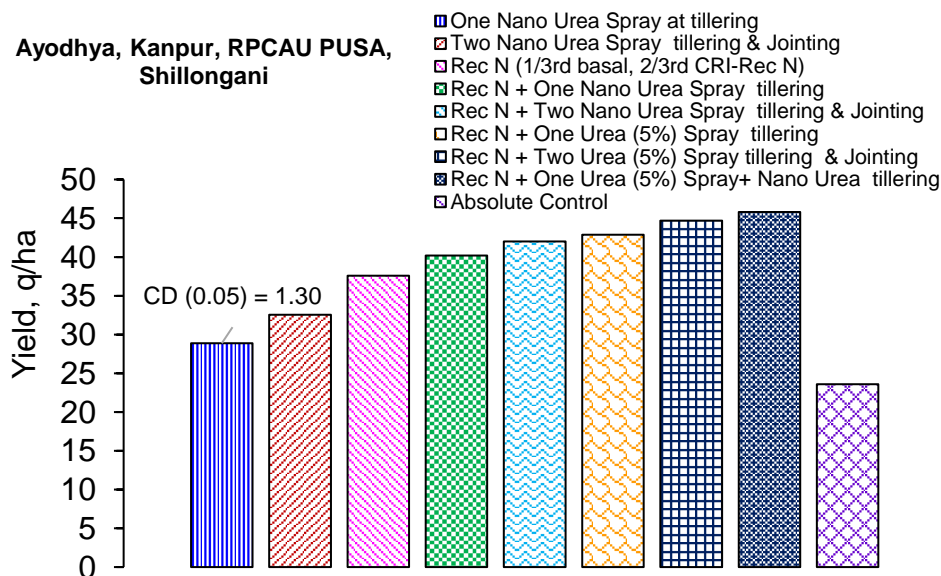


Fig. 30. Effect of nano urea on wheat productivity under restricted irrigation in NEPZ

In CZ, this trial was conducted at three locations (Indore, Udaipur, Vijapur) with nine N treatment combinations and two irrigation levels. The pooled analysis of data of three centres (Fig. 31) revealed that maximum grain yield (46.08.02 q/ha) was produced in treatment rec. N + two spray of nano urea at tillering and jointing followed by rec N + two



spray of urea (5%) at tillering and jointing (44.40 q/ha) and both treatment remained statistically at par.

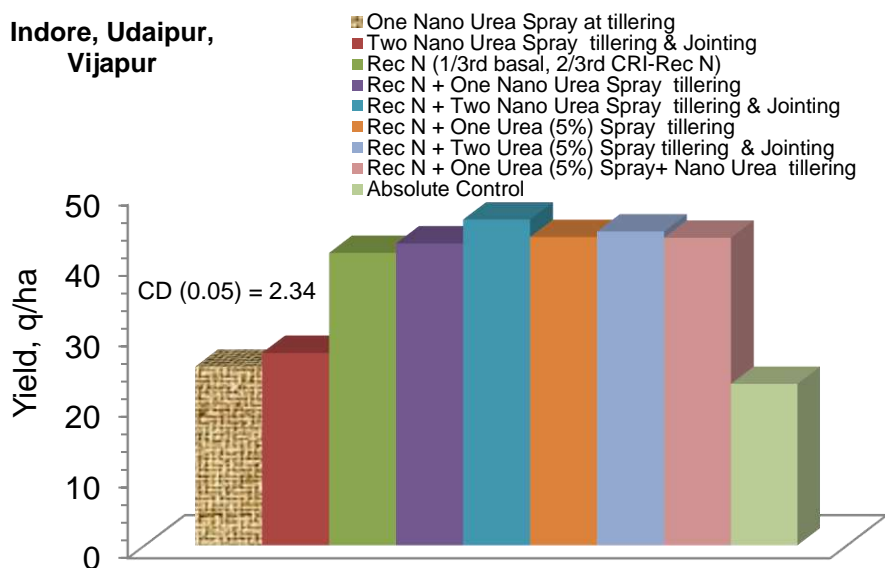


Fig. 31. Effect of nano urea on wheat productivity under restricted irrigation in CZ

#### SPL-5: Lodging management of *dicoccum* wheat using PGR

The experiment was laid out in split plot design with three varieties (MACS 2971, DDK 1029 and HW 1098) in main plot treatments and five growth regulator treatments {G1: Control; G2: CCC (2 chloroethyl- trimethyl ammonium chloride) @ 1000 ppm; G3: CCC @ 1500 ppm; G4: Ethephon @ 10 ppm and G5: Ethephon @ 30 ppm} in sub plots. Nutrient application consisted of 120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation.

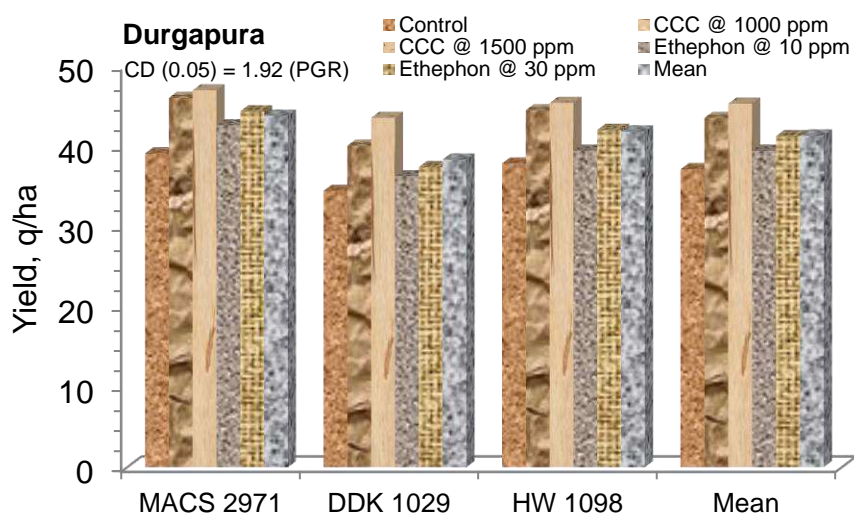


Fig. 32. Enhancing productivity of *dicoccum* wheat by using PGR in CZ

In CZ, this trial was conducted only at Durgapura centre with three genotypes and five growth regulator combinations. The data (Fig. 32) revealed that all three genotypes produce statistically at par yield and plant growth regulator treatment CCC (2 chloroethyl- trimethyl ammonium chloride) @1500 ppm was significantly superior and ranked first with 45.27 q/ha yield.

In PZ, this experiment was conducted at Dharwad, Niphad and Pune centres to explore the possibility of reducing lodging for yield enhancement of *dicoccum* wheat using plant growth regulators. The results of pooled data presented in Fig. 33 revealed that the effect of variety and growth regulator on grain yield was significant. Among all treatments, the maximum yield of 49.56 q/ha was observed for MACS 2971 variety with application of Ethephon @10 ppm. On mean basis, that application of CCC (2 chloroethyl- trimethyl ammonium chloride) @1500 ppm produced the maximum mean grain yield of 47.03 q/ha.

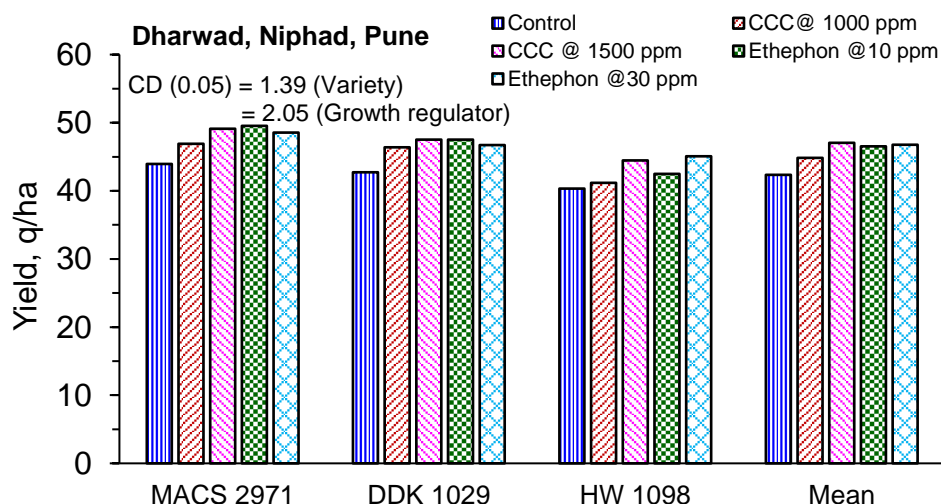


Fig. 33. Enhancing the yield potential of improved *dicoccum* wheat by using growth regulators in PZ

**SPL-6: Resource conservation techniques for enhancing the productivity and resource-use efficiency of soybean-wheat cropping system**

In PZ, this experiment was conducted at Dharwad, Niphad and Pune centres to evaluate the effect of resource conservation technologies on performance of soybean-wheat cropping system. The results of pooled data presented in Fig. 34 suggest that the highest grain yield of 58.99 q/ha was found under conventionally tilled broad bed method; however, effect of tillage method on grain yield was not significant. The combined use of soybean and wheat residue @3 t/ha each produced 10.53% higher grain yield than control treatment (no residue).

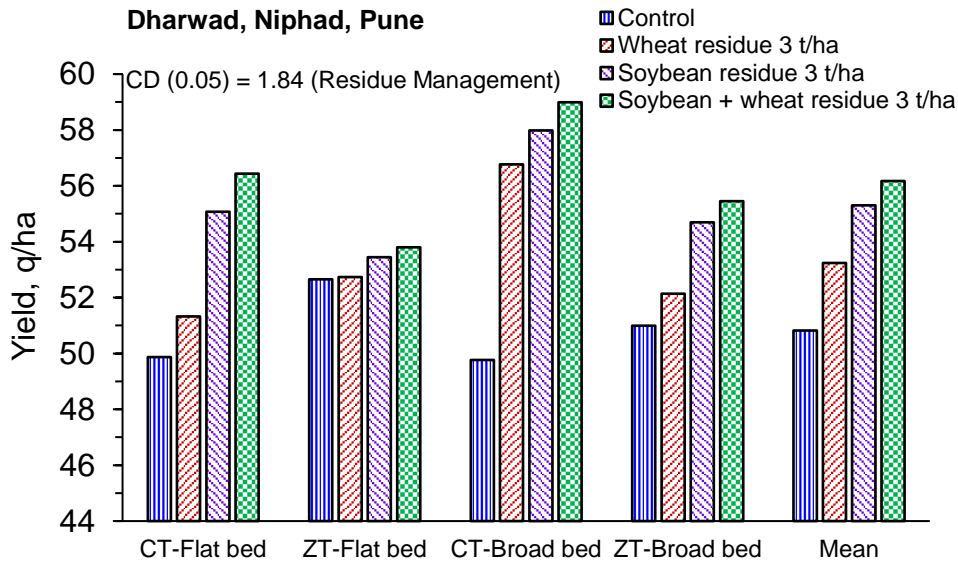


Fig. 34. Wheat productivity under RCTs in soybean-wheat cropping system in PZ

### SPL-7: Precision nutrient management for higher yield in wheat through fertigation

In PZ, this experiment was conducted at Dharwad centre with an objective of increasing wheat yield through fertigation under surface and subsurface irrigation methods. The results presented in Fig. 35 revealed that drip irrigation could not produce significant effect on grain yield. The treatment of nutrient management made significant effect on grain yield which was the maximum (43.64 q/ha) with 100% NPK through water soluble fertilizer at fortnight interval under subsurface drip irrigation. The mean yield (42.69 q/ha) under this treatment was 17.83% higher than control treatment (surface irrigation with 100% RDF).

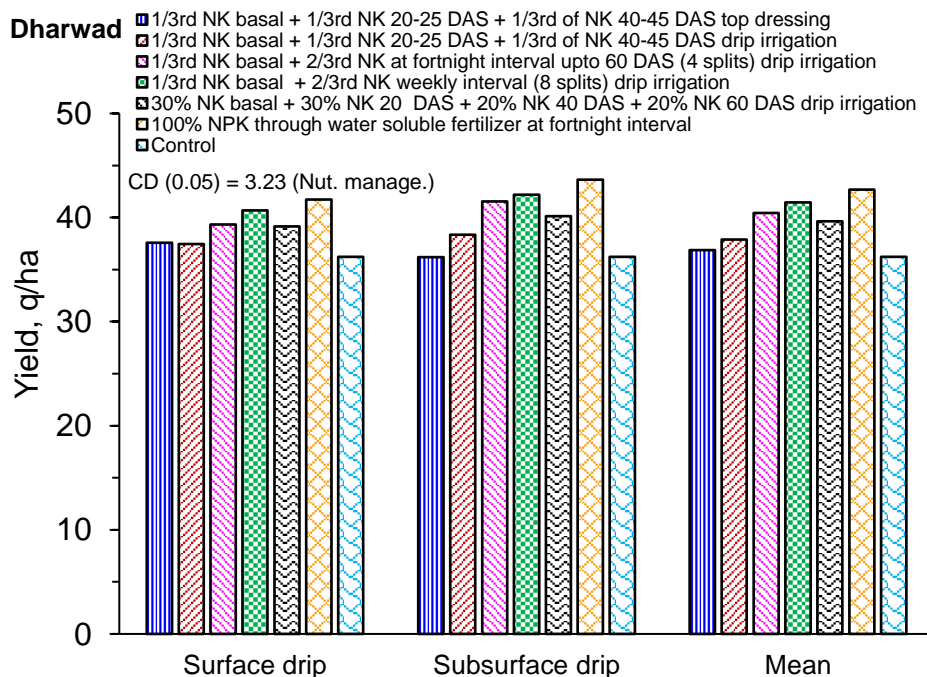


Fig. 35. Wheat yield under precise nutrient management through fertigation in PZ

### SPL-8: Improving wheat yield through foliar K application

In NWPZ, the experiment on foliar K application was conducted at one location at Jammu only. The perusal of data presented in Fig. 36 showed that number of irrigations brought significant effect on grain yield, earheads, grains/earhead and biomass. The maximum mean grain yield of 38.53 q/ha was observed with three irrigations, which was 40.26 and 6.82% higher than mean grain yield under one and two irrigation condition, respectively. Among treatments in sub-plots, the mean grain yield (34.78 q/ha) was the maximum with 4% K application and numerically better than 34.14 and 33.14 q/ha under 2% K application and control, respectively.

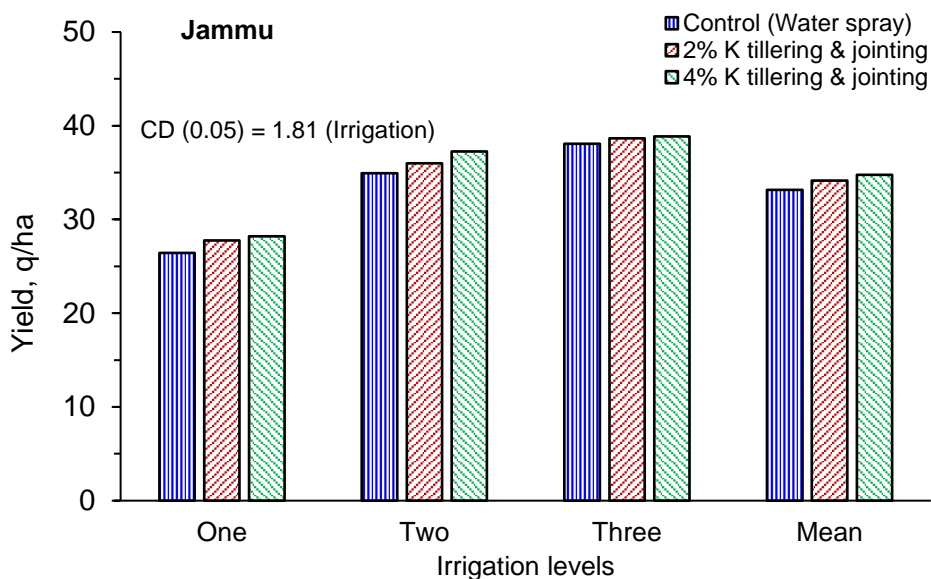


Fig. 36. Wheat productivity under irrigation levels and foliar K application in NWPZ

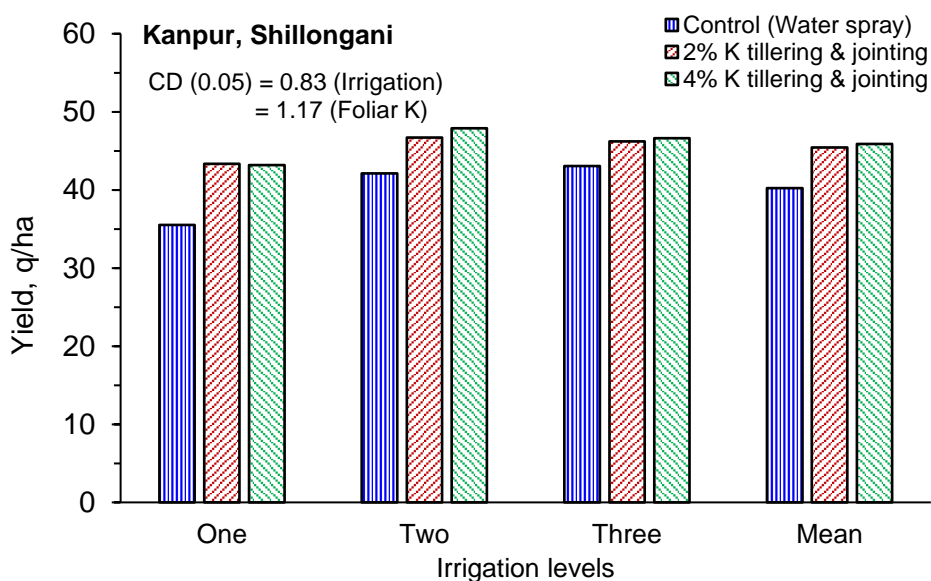


Fig. 37. Wheat productivity under irrigation levels and foliar K application in NEPZ

In NEPZ, this experiment was conducted at two locations (Kanpur and Shillongani). There was significant effects of irrigation levels and foliar application of K on the grain yield (Fig. 37). Significantly higher grain yield (45.58 q/ha) was achieved by application of irrigation at crown root initiation and flowering stage over single irrigation at CRI stage. Foliar application of 4% K resulted in significantly higher yield (45.90 q/ha) over spraying of water only although it was at par to foliar application of 2% K.

In CZ, this trial was conducted at four locations (Dhanduka, Durgapura, Jabalpur, Vijapur) and pooled analysis of data (Fig. 38) revealed that maximum and significantly higher grain yield (38.37 q/ha) was produced in three number of irrigations (at CRI, late jointing and milking stage) and foliar application of K treatment 4 % K application at tillering and jointing produce significantly higher yield (35.30 q/ha) than 2 % K application at tillering (40-45) and jointing (60-65 DAS) (33.98 q/ha) and control (31.30 q/ha).

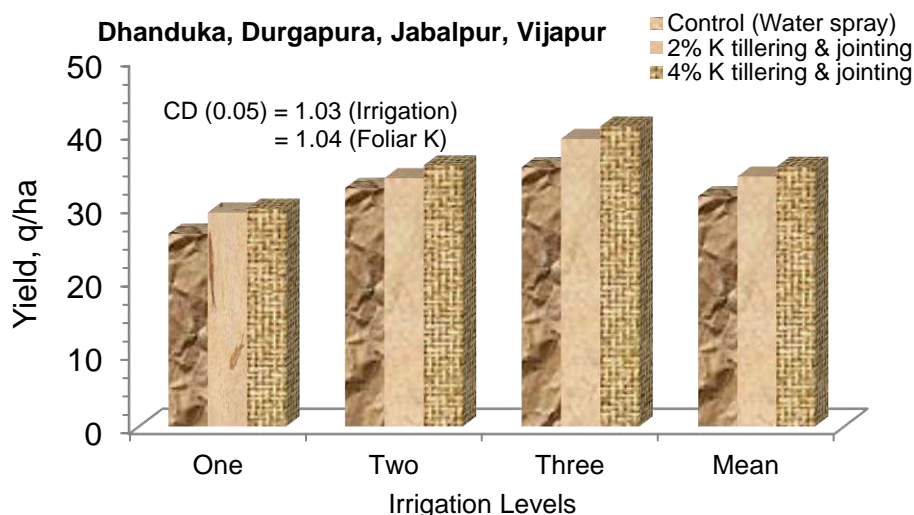


Fig. 38. Wheat productivity under irrigation levels and foliar K application in CZ

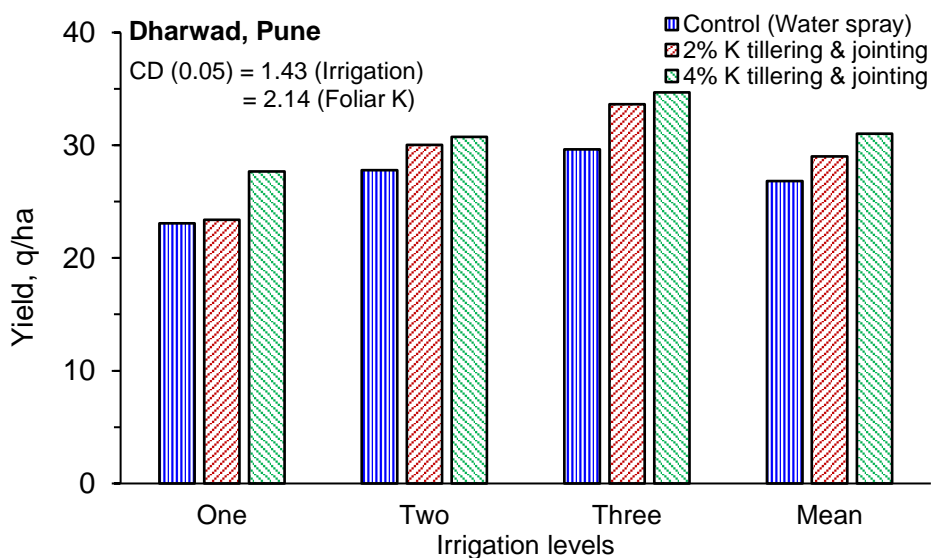


Fig. 39. Wheat productivity under irrigation levels and foliar K application in PZ

In PZ, this experiment was conducted at Dharwad and Pune centres. The results of pooled data given in Fig. 39 indicated that irrigation levels made significant effect on grain yield and it was maximum as 34.70 q/ha under three irrigation with 4% K foliar application. The foliar application of 4% K gave the maximum mean grain yield of 31.04 q/ha which was 15.69% higher than control treatment.

### SPL-9: Agronomic interventions for quality enhancement in wheat varieties across different wheat growing zones

In NWPZ, this trial was conducted with an objective to enhance quality of wheat varieties by foliar spray of sulphur (S), nitrogen (N), zinc (Zn), potash (K) and their combinations at four centres (Gurdaspur, Hisar, Ludhiana and Pantnagar). The pooled analysis of data presented in Fig. 40 revealed that the maximum mean grain yield (49.59 q/ha) was produced under the treatment of S+N+Zn+K (all nutrients spray) which remained statistically at par with all treatments except no foliar application of nutrients (control). Among varieties, DBW187 produced the maximum and significantly higher grain yield (53.41 q/ha) than all the other varieties. Maximum and significantly higher iron (Fe) content (37.26 ppm) was recorded in PBW 1 Zn genotype; however, there was no significant difference among foliar fertilization treatments. The maximum and significantly higher zinc content (39.68 ppm) was found in HD 3226 genotype followed by in PBW 1 Zn genotype (38.28 ppm) and in treatment of Zn foliar fertilization (41.76 ppm) followed by the treatment of S+N+Zn+K (40.86 ppm). Maximum and significantly higher protein content (14.3%) and maximum hectolitre weight (74.81 kg) was recorded in genotype HD 3226 indicating better quality and density (heaviness) of grains.

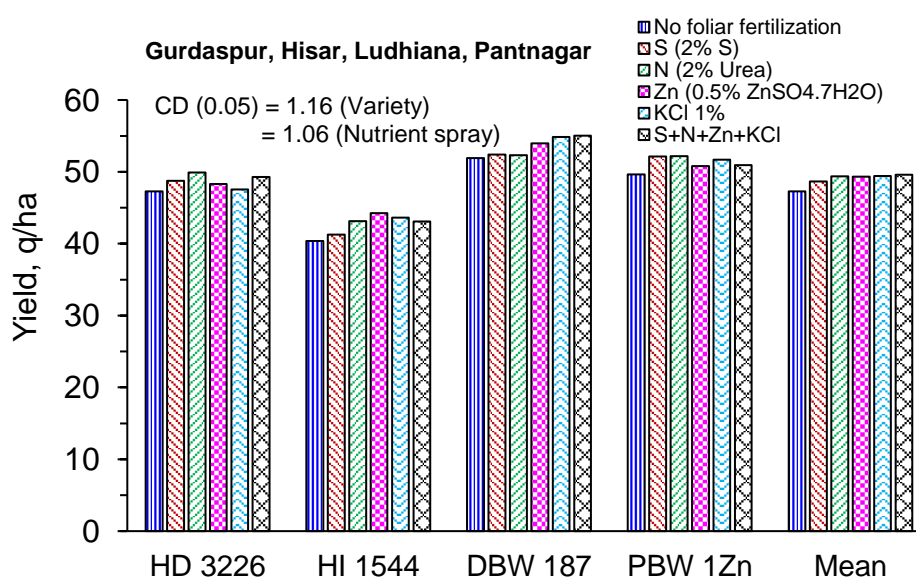


Fig. 40. Effect of foliar spray of nutrients on wheat quality in NWPZ

In NEPZ, this experiment was conducted at Kanpur center only. There was significant effects of foliar spray of S, N, Zn, K and their combinations on the grain yield, whereas different

genotypes were found at par (Fig. 41). The highest grain yield (38.88 q/ha) and grains per earhead were observed in HI 1544 genotype when Zn (0.5% ZnSO<sub>4</sub>.7H<sub>2</sub>O) was sprayed. Significantly higher Fe content was observed through foliar spray of S+N+Zn+KCl, whereas foliar spray of Zn (0.5% ZnSO<sub>4</sub>.7H<sub>2</sub>O) resulted in significantly higher Zn content.

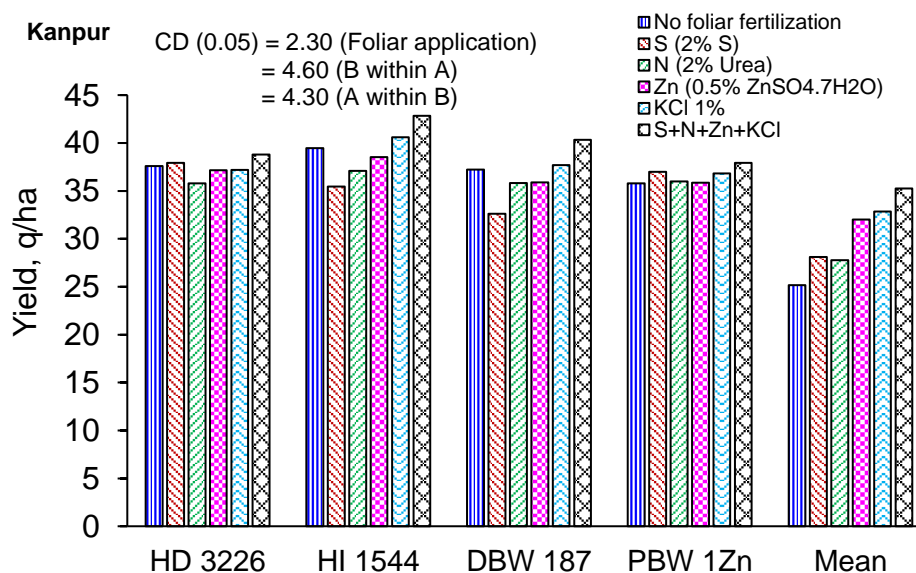


Fig. 41. Effect of foliar spray of nutrients on wheat quality in NEPZ

In CZ, this trial was conducted only at Vijapur centre with four genotypes (HD 3226, HI 1544, DBW 187, and PBW 1 Zn) and six combinations of foliar fertilization. The data (Fig. 42) revealed that maximum grain yield (45.21 q/ha) was produced under the treatment of N (2% urea spray) though statistically all treatments remained at par.

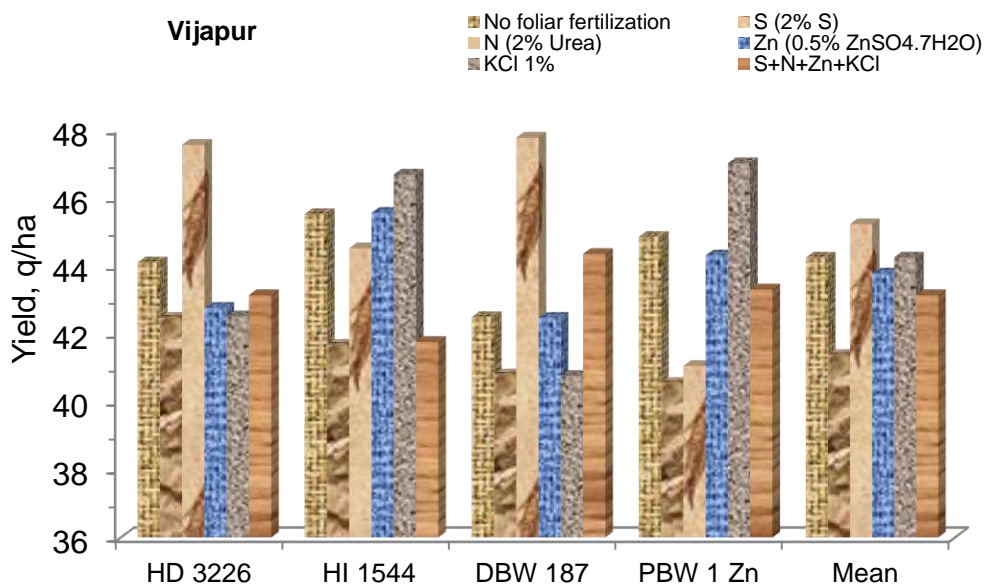


Fig. 42. Effect of foliar spray of nutrients on wheat quality in CZ

**SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat**

In NHZ, this experiment was conducted at Shimla centre only. Application of recommended dose of NPK with and without seed treatment recorded significantly higher grain yield compared to all the lower doses of NPK applied with and without seed treatment (Fig. 43). The lowest grain yield (17.85 q/ha) was recorded in control plots (no fertilizer and no seed treatment). The seed treatment did not cause any significant yield improvement except at 75% Rec NPK rates.

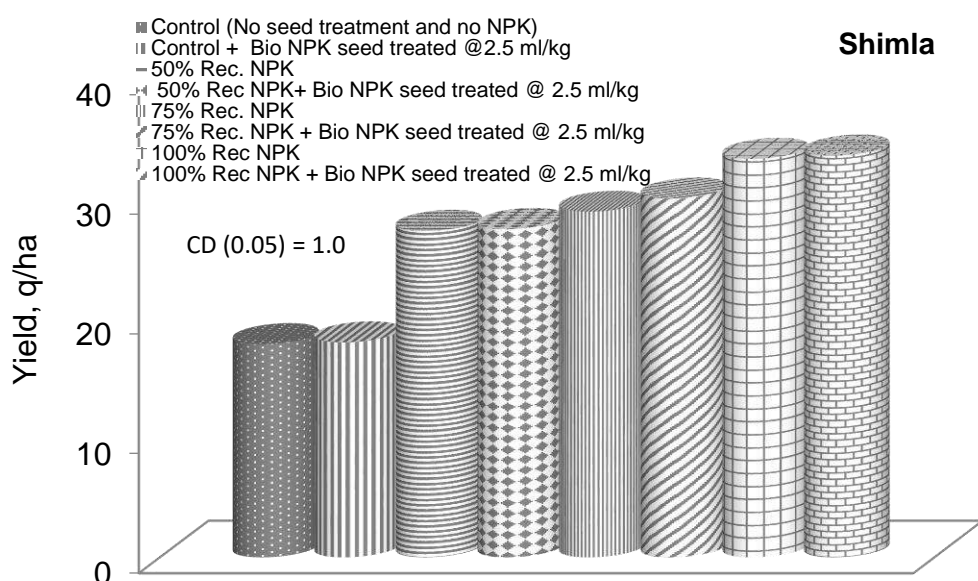


Fig. 43. Wheat productivity under NPK solubilizing microbial consortium in NHZ

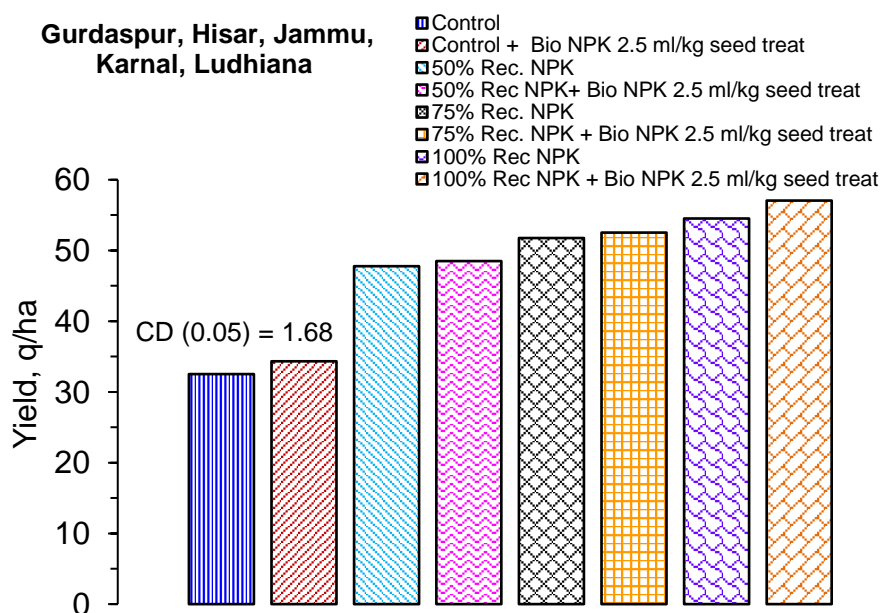


Fig. 44. Wheat productivity under NPK solubilizing microbial consortium in NWPZ



In NWPZ, this experiment was conducted at five centres viz., Gurdaspur, Hisar, Jammu, Karnal and Ludhiana. The pooled data of all the five centres presented in Fig. 44 showed that the maximum grain yield of 57.05 q/ha was recorded with 100% NPK + seed treatment with Bio NPK @2.5 ml/kg followed by 54.50 q/ha with 100% NPK. The seed treatment with Bio NPK @2.5 ml/kg brought about significant improvement in grain yield only under control and with 100% NPK treatments.

In NEPZ, this experiment was conducted at three locations (IARI PUSA, RPCAU PUSA and Varanasi). The maximum grain yield (42.6 q/ha) was obtained under 100% recommended NPK + seed treatment with Bio NPK @ 2.5 ml/kg and was significantly superior to all other treatments except 100% recommended NPK (Fig. 45). The yield gain in 100% recommended NPK + seed treatment with Bio NPK @ 2.5 ml/kg treatment over control was 91.9%.

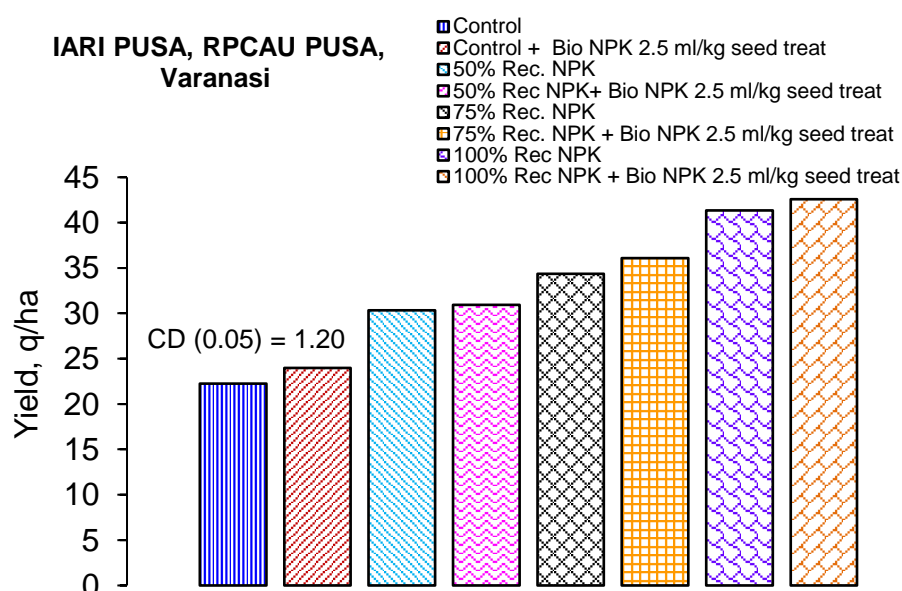


Fig. 45. Wheat productivity under NPK solubilizing microbial consortium in NEPZ

In CZ, this trial was conducted at three locations (Indore, Junagadh, Vijapur) and the perusal of pooled data (Fig. 46) revealed that maximum and significantly higher grain yield (54.87 q/ha) was produced by the treatment 100% Rec. NPK + seed treatment with Bio NPK @2.5ml/kg followed by 100% Rec. NPK (54.25 q/ha) which remained statistically at par among themselves.

In PZ, this experiment was conducted at Pune centre. The results presented in Fig. 47 revealed that the maximum grain yield was found as 55.77 q/ha when 100% NPK + seed treatment with Bio NPK @2.5 ml/kg was used. The application of 100% NPK resulted into a grain yield of 53.78 q/ha. Based on the entire results, it can be stated that effect of seed treatment on grain yield was significant under control and 100% NPK treatments only.

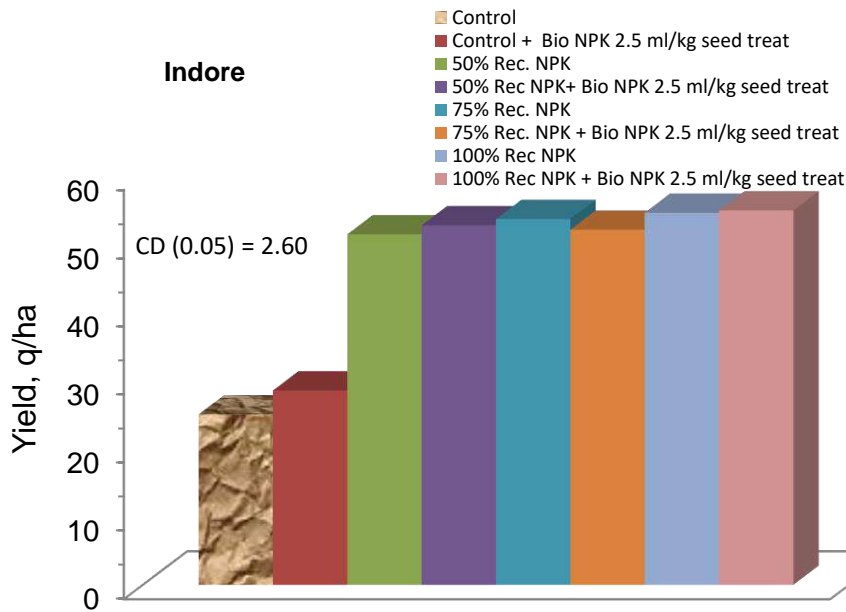


Fig. 46. Wheat productivity under NPK solubilizing microbial consortium in CZ

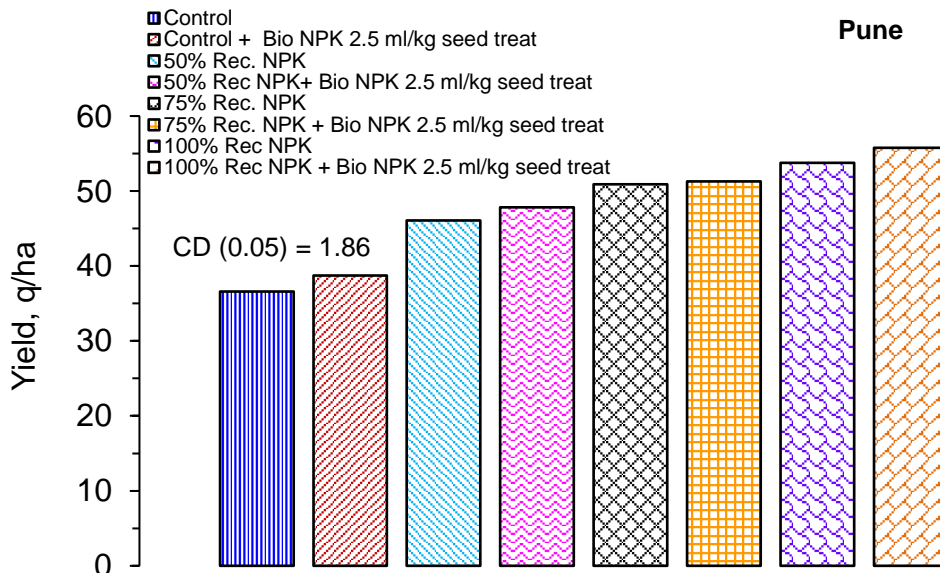


Fig. 47. Wheat productivity under NPK solubilizing microbial consortium in PZ

### SPL-11: Improving wheat productivity through silica foliar application

In PZ, this experiment was conducted at Dharwad centre with an objective of reducing moisture stress and to enhance the yield potential of wheat by using silica sprays. The results given in Fig. 48 suggested that either irrigation levels or foliar silica application could not improve the grain yield significantly. The maximum grain yield of 32.68 q/ha was observed under three irrigation with foliar application of 2 ml KSi/litre of water. The mean grain yield across irrigation levels and foliar silica application was found in the range of 27.66-30.28 and 27.39-31.09 q/ha, respectively.

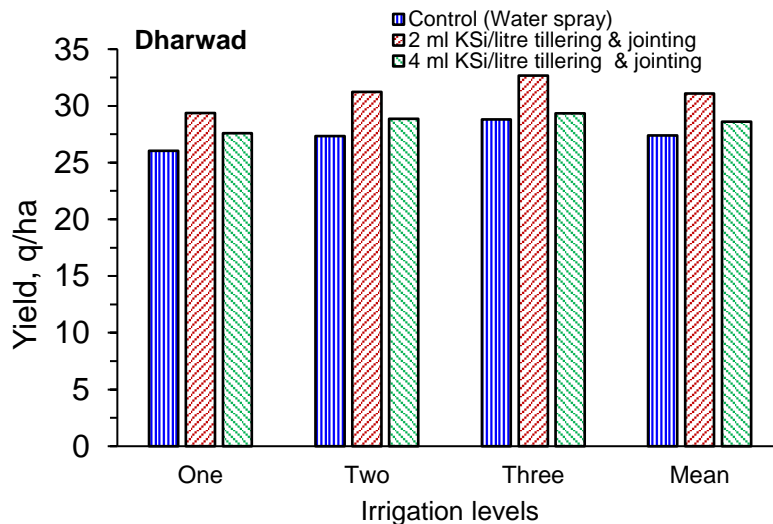


Fig. 48. Effect of Silica foliar (KSi) application on wheat productivity in PZ

### SPL-12: Improving wheat productivity through nutrients solubilizing microbial (Rhizosphere) consortium

In PZ, this experiment was conducted at Dharwad centre with the aim of maximizing wheat productivity by nutrients solubilizing microbial (rhizosphere) consortium. The results shown in Fig. 49 revealed that application of 75% recommended NPK + seed treatment with microbial consortium @4 ml/kg seed + 4% microbial consortium spray at 20-25 DAS gave the maximum grain yield of 38.73 q/ha. It was statistically similar to grain yield under the application of seed treatment either @2 ml/kg or 4 ml/kg with 100% NPK. The grain yield was significantly improved when seed treatment @2 ml/kg either with 50% or 75% NPK was changed to seed treatment @4 ml/kg + spray of 4% microbial consortium with 50 or 75% NPK.

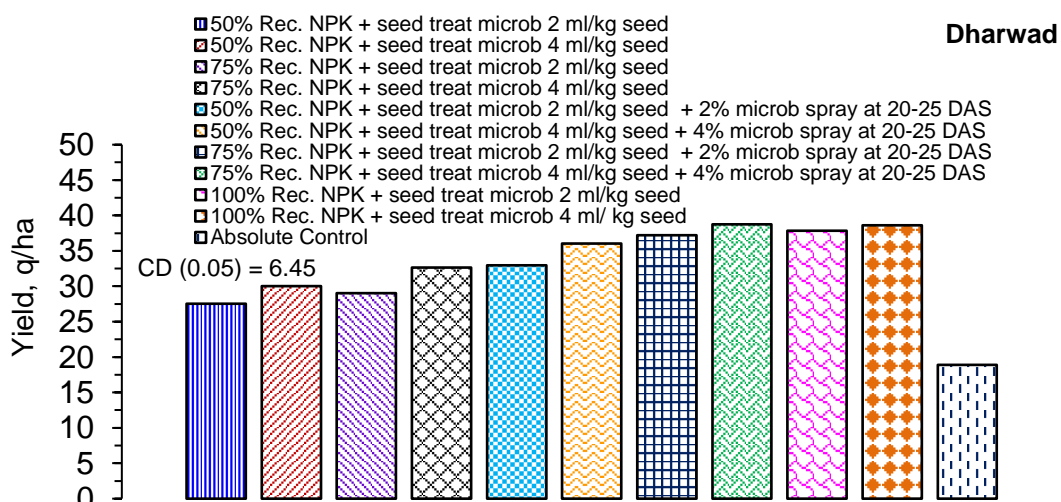


Fig. 49. Wheat productivity under N, P and K solubilizing microbial consortium in PZ

## Northern Hill Zone

The Northern Hills Zone represents Himachal Pradesh, parts of Jammu & Kashmir, and Uttarakhand. The five centres namely Almora, Bajaura, Khudwani, Malan and Shimla are actively engaged in wheat research under All India Coordinated Wheat and Barley Improvement Project. The data on meteorological parameters received from centres have been reported in Annexure II. The rainfall was well distributed at all the locations; the highest rainfall of 445.7 mm was recorded at Shimla during the crop growing period followed by 346.9 mm at Bajaura, 342.2 mm at Malan, 65.4 mm at Almora and 52.3 mm at Khudwani. The minimum and maximum temperatures were -2.9 °C and 34.0 °C at Almora, -2.3 °C and 31.7 °C at Bajaura, -4.2 °C and 23.5 °C at Khudwani, 5.5 °C and 33.9 °C at Malan, and -0.6 °C and 26.9 °C at Shimla, respectively. The soil data received from three centres (Almora, Bajaura and Malan) are presented in Annexure III. The texture of soil at Bajaura was silty loam. The organic carbon content of Almora, Bajaura and Malan centres was 0.8, 0.57 and 0.79 per cent, respectively, with low to medium in nitrogen, medium to high in phosphorus and potash contents.

The performance of test genotypes was evaluated under restricted irrigation conditions at different locations and the results are presented here under;

### Restricted Irrigation

The restricted irrigation trial was conducted with the objective to evaluate the *aestivum* test entry namely VL 2041 against four checks varieties HPW 349, VL 907, HS 562, HF 507 at five locations (Almora, Bajaura, Khudwani, Malan and Shimla). For pooled analysis, Khudwani centre data were not included due to incomplete data and rest four centre data were taken into account. The trial was laid out in a split plot design with number of irrigations in main and genotypes in sub plots with three replications. The sowing was done using the normalized (adjusted considering 1000 grains weight as 38 g) seed rate of 100 kg/ha at a row-to-row spacing of 20 cm. Nitrogen, phosphorus and potash (90:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) were applied as full basal in I1 treatment *i.e.* no irrigation, whereas 1/3<sup>rd</sup> N and full phosphorus and potash were applied as basal at sowing and remaining 2/3<sup>rd</sup> nitrogen at first irrigation *i.e.* at 20-25 days after sowing in I2 and I3 treatments.

The centrewise yield and zonal mean yield are presented in Table 1.1. The pooled analysis is presented in Table 1.2 and the centre wise data are in Annexure-I in Tables 1.2.1 to 1.2.5. The perusal of data in Table 1.2 indicates that increasing the irrigation level significantly increased the grain yield and earhead/m<sup>2</sup>. Maximum and significantly higher grain yield (41.16 q/ha) was obtained with two irrigations as compared with zero and one irrigations levels. Increasing

irrigation level enhanced the grain yield mainly due to significant increase in earhead/m<sup>2</sup>. All the check varieties were significantly superior to test entry VL 2041. Among check varieties, HS 562 (C) produced significantly higher yield (40.48 q/ha) on mean basis. Irrigation level and genotypes interaction was non-significant for grain yield and yield attributes. Check variety HS 562 ranked first at all irrigation levels for grain yield. The centre wise data are presented in Tables 1.2.1 to 1.2.5 in Annexure-I.

<b>Table 1.1. Northern Hill Zone</b>		<b>RIR-TS-TAS Centrewise</b>			<b>Yield, q/ha</b>	<b>2021-22</b>
<b>Irrigation</b>	<b>Genotype</b>	<b>Almora</b>	<b>Bajaura</b>	<b>Malan</b>	<b>Shimla</b>	<b>Zonal mean</b>
Zero	HPW 349 (C)	41.11	44.13	31.51	25.33	35.52
	VL 2041	44.72	42.63	26.10	22.25	33.92
	VL 907 (C)	42.69	41.79	24.38	29.07	34.48
	HS 562 (C)	46.67	47.29	27.09	29.37	37.61
	HS 507 (C)	45.74	45.17	30.97	24.59	36.62
	Mean	44.19	44.20	28.01	26.12	35.63
One	HPW 349 (C)	41.94	45.42	32.06	27.44	36.72
	VL 2041	47.31	49.25	23.91	23.89	36.09
	VL 907 (C)	46.48	46.38	27.17	30.37	37.60
	HS 562 (C)	48.15	46.63	32.13	36.34	40.81
	HS 507 (C)	48.24	47.54	36.40	25.09	39.32
	Mean	46.43	47.04	30.33	28.63	38.11
Two	HPW 349 (C)	43.24	48.31	36.62	35.54	40.93
	VL 2041	47.13	51.67	32.71	24.56	39.02
	VL 907 (C)	46.67	52.71	34.81	31.32	41.38
	HS 562 (C)	50.46	46.21	34.85	40.62	43.04
	HS 507 (C)	50.09	48.54	39.85	27.38	41.47
	Mean	47.52	49.49	35.77	31.88	41.16
Mean	HPW 349 (C)	42.10	45.95	33.40	29.44	37.72
	VL 2041	46.39	47.85	27.57	23.56	36.34
	VL 907 (C)	45.28	46.96	28.78	30.25	37.82
	HS 562 (C)	48.43	46.71	31.36	35.44	40.48
	HS 507 (C)	48.02	47.08	35.74	25.69	39.13
	Mean	46.04	46.91	31.37	28.88	38.30
CD (0.05)	Irrigation (A)	0.99	1.66	4.04	2.02	1.01
	Genotype (B)	2.19	NS	2.29	1.81	0.94
	B within A	NS	2.23	NS	3.13	NS
	A within B	NS	2.40	NS	3.23	NS
Date of Sowing:	01.11.2021	26.10.2021	11.11.2021	25.10.2021		
Date of Harvesting:	29.04.2022		30.04.2022	10.05.2022		

**Table 1.2 Northern Hill Zone RIR-TS-TAS Pooled 2021-22**

Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	35.52	3	36.72	4	40.93	4	37.72	4
VL 2041	33.92	5	36.09	5	39.02	5	36.34	5
VL 907 (C)	34.48	4	37.60	3	41.38	3	37.82	3
HS 562 (C)	37.61	1	40.81	1	43.04	1	40.48	1
HS 507 (C)	36.62	2	39.32	2	41.47	2	39.13	2
Mean	35.63		38.11		41.16		38.30	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	1.01		0.94		NS		NS	
<b>Earhead/sqm</b>								
HPW 349 (C)	297	3	332	2	353	3	327	3
VL 2041	286	5	310	5	326	4	307	4
VL 907 (C)	292	4	313	4	314	5	306	5
HS 562 (C)	305	1	337	1	356	1	332	1
HS 507 (C)	303	2	330	3	355	2	329	2
Mean	296		324		341		320	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	11.47		10.05		NS		NS	
<b>Grains/Earhead</b>								
HPW 349 (C)	28.83	3	27.22	5	28.32	5	28.12	5
VL 2041	29.29	2	27.64	4	28.38	4	28.44	4
VL 907 (C)	28.66	5	27.85	3	31.48	1	29.33	3
HS 562 (C)	30.11	1	29.72	2	29.96	2	29.93	1
HS 507 (C)	28.78	4	30.20	1	29.19	3	29.39	2
Mean	29.14		28.53		29.47		29.04	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	42.18	4	42.57	4	42.92	3	42.56	3
VL 2041	41.53	5	42.74	3	43.29	2	42.52	4
VL 907 (C)	42.42	2	44.13	1	43.46	1	43.34	1
HS 562 (C)	42.38	3	44.03	2	42.32	4	42.91	2
HS 507 (C)	42.86	1	41.59	5	41.89	5	42.11	5
Mean	42.27		43.01		42.78		42.69	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	

**Centers:** Almora, Bajaura, Malan, Shimla

## **North Western Plains Zone**

The North Western Plains Zone (NWPZ) is the most important wheat growing zone of the country. In this zone, the areas covered are the states of Haryana, Punjab, Delhi, western UP, part of Rajasthan and Jammu area of J&K. Ten centres in this zone namely Bikaner, Ludhiana, Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana, Pantnagar and Sriganaganagar are actively engaged in wheat research activities under All India Coordinated Wheat and Barley Improvement Project (AICW&BIP). The data on soil and various meteorological parameters for various centres are given in Annexure-II and Annexure-III, respectively. Soils of this zone are sandy loam to clay loam. The soil organic carbon at various locations varied from 0.21% at Sriganaganagar to 0.72% at Pantnagar. Soils of this zone are low in available nitrogen, medium to high in available phosphorus and available potash. The maximum rainfall was received at Pantnagar (584.4 mm), followed by Delhi (377.4 mm), Jammu (354.0 mm), Gurdaspur (323.9 mm), Karnal (209.2 mm), Ludhiana (194.5 mm), Gwalior (127.4 mm), Sriganaganagar (79.6 mm) and the lowest amount of rain (78.0 mm) during the wheat crop season 2021-22 was received at Hisar. The maximum and minimum temperatures at different locations were 43.3 and 4.4 °C at Delhi, 39.3 and 3.9 °C at Gurdaspur, 43.9 and 4.7 °C at Gwalior, 41.5 and 3.3 °C at Hisar, 39.6 and 2.9 °C at Jammu, 40.6 and 4.9 °C at Karnal, 39.9 and 4.9 °C at Ludhiana, 38.2 and 4.2 °C at Pantnagar, 44.1 and 4.7 °C at Sriganaganagar, respectively. In this zone, three coordinated trials were conducted to evaluate second year AVT genotypes for different growing conditions at various locations.

### **EVALUATION UNDER DIFFERENT GROWING CONDITIONS**

The performance of test genotypes was evaluated under different sowing conditions, restricted irrigation conditions and at high fertility condition at different locations and the results are summarized here under;

#### **Irrigated Timely Sown**

Two test entry, HD3406 and PBW826 were evaluated against four checks viz. HD2967(c), HD3086(c), DBW187(c) and DBW222(c) at nine locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana, Pantnagar and Sriganaganagar) under timely (5<sup>th</sup> November to 11<sup>th</sup> November) and late (10<sup>th</sup> December to 16<sup>th</sup> December) sown conditions. Karnal and Pantnagar centre's data were not considered in pooled analysis due to low mean yield (<50 q/ha under timely sown conditions). The trial was conducted in split plot design with dates of sowing in main plots and genotypes in sub plots. The sowing was done using the normalized (adjusted considering 1000 grains weight of 38 g) seed rate of 100 kg/ha at a row-to-row spacing of 20 cm. Nitrogen was applied in three splits (1/3<sup>rd</sup> at sowing, 1/3<sup>rd</sup> at first irrigation i.e. at 20-25 days

after sowing and 1/3<sup>rd</sup> at second irrigation i.e. 40-45 days after sowing), whereas full phosphorus and potash was applied as basal.

The centrewise yield and zonal mean yield are given in Table 2.1. The pooled data are presented in Table 2.2 and the centre wise data are in Annexure-I as Tables 2.2.1 to 2.2.9. The significant effect of sowing time and genotypes was observed on yield and yield attributes. The interaction effect was significant for 1000 grains weight only. Timely sowing gave higher productivity of all genotypes compared to late sowing and on an average, yield declined by 21.5% when sowing was delayed from timely to late sowing circumstances. The yield decline was due to significant reduction in effective tillering, grains/earhead and thousand grains weight under late sown conditions over timely sown conditions. On an average basis, the test genotype PBW 826 was top yielder (53.94 q/ha) and recorded significantly higher grain yield compared to other test entry HD3406 and checks. The second test entry HD3406 remained on fourth rank based on pooled average yield basis. The second highest yielder was the check entry DBW 222 with an average yield of 52.12 q/ha. Test genotype PBW 826 recorded 3.4, 6.9, 8.8, 9.3 and 11.6% higher grain yield than DBW 222(c), DBW 187(c), HD 3406, HD 2967(c) and HD 3086(c), respectively. Test entry PBW 826 had the highest effective tillering (370 earheads/sq.m) and the boldest grains (38.99 g thousand grains weight). The highest grains/earhead were observed in check variety DBW 222 (40.94 grains/earhead) followed by HD 2967 (40.18 grains/earhead). The perusal of centre wise results indicated that the yield decline was the highest at Sriganaganagar (40.2.7%) followed by Hisar (27.7%) and the lowest at Gurdaspur (1.0%) when sowing was delayed from second week of November to third week of December.

### **Restricted Irrigation**

The restricted irrigation trial was conducted with the objective to evaluate the three *aestivum* test entries namely HI1653, HI1654 and HD3369 against six checks varieties HD 3043, NIAW 3170, DBW 296, PBW 644, HI 1628 and HUW 838 at nine locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana, Pantnagar and Sriganaganagar). For pooled analysis, Karnal centre data were not included due to low mean yield and rest eight centre data were pooled for statistical analysis. The trial was laid out in a split plot design with number of irrigations in main and genotypes in sub plots with three replications. The sowing was done using the normalized (adjusted considering 1000 grains weight as 38 g) seed rate of 100 kg/ha at a row-to-row spacing of 20 cm. Nitrogen, phosphorus and potash (90:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) were applied as full basal in I<sub>1</sub> treatment i.e. no irrigation, whereas 1/3<sup>rd</sup> N and full phosphorus and potash were applied as basal at sowing and remaining 2/3<sup>rd</sup> nitrogen at first irrigation i. e. at 20-25 days after sowing in I<sub>2</sub> and I<sub>3</sub> treatments.



Table 2.1. North Western Plain Zone		IR-DOS-TAS			Centrewise		Yield, q/ha		2021-22	
Sowing Time	Genotype	Delhi	Gurdaspur	Gwalior	Hisar	Jammu	Ludhiana	Sriganganagar	Zonal mean	
Timely	HD 3406	48.55	56.06	43.25	61.35	58.02	50.63	68.25	55.16	
	PBW 826	50.57	64.30	54.76	59.37	57.83	60.35	74.95	60.30	
	HD 2967 (c)	49.08	54.13	46.43	50.08	51.87	54.66	74.61	54.41	
	DBW 187 (c)	51.45	57.34	52.38	59.01	53.20	53.65	65.47	56.07	
	HD 3086 (c)	53.32	57.68	49.21	46.90	50.54	52.68	64.35	53.53	
	DBW 222 (c)	50.45	63.88	54.09	60.00	55.00	56.61	73.65	59.10	
	Mean	50.57	58.90	50.02	56.12	54.41	54.76	70.22	56.43	
Late	HD 3406	34.62	59.99	38.86	43.89	40.62	46.07	38.75	43.26	
	PBW 826	38.80	62.33	51.53	46.31	44.22	48.23	41.62	47.58	
	HD 2967 (c)	31.98	56.44	40.33	39.52	45.41	48.55	41.81	43.43	
	DBW 187 (c)	35.72	57.92	41.71	46.94	43.14	42.84	42.38	44.38	
	HD 3086 (c)	32.18	51.77	41.17	39.09	40.64	42.06	45.93	41.83	
	DBW 222 (c)	37.17	61.36	48.23	45.44	41.39	41.02	41.41	45.14	
	Mean	35.08	58.30	43.64	43.53	42.57	44.79	41.98	44.27	
Mean	HD 3406	41.58	58.03	41.06	52.62	49.32	48.35	53.50	49.21	
	PBW 826	44.68	63.32	53.15	52.84	51.03	54.29	58.29	53.94	
	HD 2967 (c)	40.53	55.28	43.38	44.80	48.64	51.61	58.21	48.92	
	DBW 187 (c)	43.58	57.63	47.04	52.98	48.17	48.24	53.93	50.22	
	HD 3086 (c)	42.75	54.72	45.19	43.00	45.59	47.37	55.14	47.68	
	DBW 222 (c)	43.81	62.62	51.16	52.72	48.20	48.81	57.53	52.12	
	Mean	42.82	58.60	46.83	49.82	48.49	49.78	56.10	50.35	
CD (0.05)	Sowing (A)	1.34	NS	2.83	2.94	1.21	1.00	0.57	0.40	
	Variety (B)	0.81	3.67	2.63	2.28	3.01	2.29	2.75	1.00	
	B within A	1.14	NS	NS	3.22	NS	3.24	3.89	NS	
	A within B	1.31	NS	NS	3.42	NS	3.01	3.57	NS	
Date of Sowing:	Timely	11.11.2021	06.11.2021	10.11.2021	10.11.2021	11.11.2021	06.11.2021	05.11.2021		
	Late	13.12.2021	10.12.2021	14.12.2021	13.12.2021	11.12.2021	09.12.2021	10.12.2021		
Date of Harvesting:	Timely	08.04.2022	20.04.2022	10.04.2022	14.04.2022	24.04.2022	21.04.2022	11.04.2022		
	Late	15.04.2022	02.05.2022	12.04.2022	19.04.2022	30.04.2022	21.04.2022	15.04.2022		

<b>Table 2.2. North Western Plain Zone IR-DOS-TAS</b>					<b>Pooled</b>	<b>2021-22</b>
Genotype	Date of Sowing				Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HD 3406	55.16	4	43.26	5	49.21	4
PBW 826	60.30	1	47.58	1	53.94	1
HD 2967 (c )	54.41	5	43.43	4	48.92	5
DBW 187 (c )	56.07	3	44.38	3	50.22	3
HD 3086 (c )	53.53	6	41.83	6	47.68	6
DBW 222 (c )	59.10	2	45.14	2	52.12	2
Mean	56.43		44.27		50.35	
CD (0.05)	Sowing (A) 0.40	Variety (B) 1.00		B within A NS		A within B NS
<b>Earhead/sq.m.</b>						
HD 3406	392	2	362	2	377	2
PBW 826	396	1	363	1	379	1
HD 2967 (c )	384	4	355	5	370	4
DBW 187 (c )	379	5	343	6	361	6
HD 3086 (c )	374	6	357	3	365	5
DBW 222 (c )	385	3	356	4	370	3
Mean	385		356		370	
CD (0.05)	Sowing (A) 5.25	Variety (B) 8.11		B within A NS		A within B NS
<b>1000 grains weight, g</b>						
HD 3406	37.83	4	32.03	6	34.93	5
PBW 826	41.15	1	36.84	1	38.99	1
HD 2967 (c )	35.92	6	33.07	4	34.50	6
DBW 187 (c )	40.05	2	35.42	2	37.74	2
HD 3086 (c )	38.25	3	32.94	5	35.60	3
DBW 222 (c )	37.05	5	33.74	3	35.39	4
Mean	38.38		34.01		36.19	
CD (0.05)	Sowing (A) 0.35	Variety (B) 0.72		B within A 1.02		A within B 0.99
<b>Grains/earhead</b>						
HD 3406	38.40	5	38.92	3	38.66	3
PBW 826	38.58	4	37.17	6	37.88	6
HD 2967 (c )	40.94	2	39.41	1	40.18	2
DBW 187 (c )	38.17	6	37.72	4	37.95	5
HD 3086 (c )	39.15	3	37.27	5	38.21	4
DBW 222 (c )	42.49	1	39.39	2	40.94	1
Mean	39.62		38.31		38.97	
CD (0.05)	Sowing (A) 0.58	Variety (B) 1.18		B within A NS		A within B NS

Centres: Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Ludhiana and Sriganaganagar

The centrewise yield and zonal mean yield are presented in Table 2.3. The perusal of pooled data in Table 2.4 indicates that increasing the irrigation level significantly increased the grain yield, earhead/m<sup>2</sup> and thousand grain weight. The maximum and significantly higher grain yield (47.74 q/ha) was obtained with two irrigations as compared with zero and one irrigations levels. Increasing irrigation level enhanced the grain yield mainly due to significant increase in earhead/m<sup>2</sup> and thousand grain weight. The check variety HUW 838(c) produced significantly higher mean grain yield (45.27 q/ha) as compared to all test entries and other checks except test entry HI1654 (44.65q/ha) which was at par.

Table 2.3. North Western Plain Zone		RIR-TS-TAS			Centrewise		Yield, q/ha			2021-22
Irrigation	Genotype	Delhi	Gurdaspur	Gwalior	Hisar	Jammu	Ludhiana	Pantnagar	Sriganganagar	Zonal mean
Zero	HI1654	37.65	56.59	41.37	36.26	41.78	34.76	43.68	23.40	39.44
	HI1653	36.60	51.73	36.05	37.07	40.18	48.57	41.60	26.22	39.75
	HD3043 (c)	32.72	51.60	34.83	35.48	38.54	33.68	37.65	23.20	35.96
	NIAW3170 (c)	31.93	52.32	35.10	42.86	37.30	37.73	39.00	29.49	38.22
	HD3369	31.00	54.26	38.78	39.42	37.21	40.46	47.55	23.03	38.96
	DBW296 (c)	34.08	55.50	33.98	38.71	37.13	42.70	41.66	15.10	37.36
	PBW644 (c)	32.74	55.70	32.99	36.22	38.98	36.77	42.72	22.55	37.33
	HI1628 (c)	33.57	49.84	31.29	42.28	39.54	40.35	43.75	19.35	37.50
	HUW838 (c)	34.93	51.55	38.27	41.50	38.68	45.34	45.65	22.55	39.81
	Mean	33.91	53.23	35.85	38.87	38.82	40.04	42.58	22.77	38.26
One	HI1654	40.37	57.53	42.82	40.20	41.39	47.33	50.77	43.81	45.53
	HI1653	39.34	55.74	37.09	43.61	38.96	55.71	51.51	43.27	45.65
	HD3043 (c)	36.87	54.62	36.26	41.50	38.41	46.70	41.24	28.67	40.53
	NIAW3170 (c)	35.05	53.61	38.21	47.48	38.66	50.53	46.54	47.59	44.71
	HD3369	35.27	59.34	41.13	47.69	39.05	46.75	51.85	39.86	45.12
	DBW296 (c)	36.43	56.06	38.10	42.11	37.47	50.06	50.18	44.63	44.38
	PBW644 (c)	35.72	61.57	38.10	40.71	37.17	41.88	45.87	39.56	42.57
	HI1628 (c)	37.07	59.61	34.35	45.17	40.22	49.31	45.18	34.42	43.17
	HUW838 (c)	38.02	63.33	43.82	51.02	38.21	49.55	51.36	40.78	47.01
	Mean	37.12	57.94	38.88	44.39	38.84	48.65	48.28	40.29	44.30
Two	HI1654	41.93	61.56	47.96	46.29	40.93	46.32	51.82	55.07	48.99
	HI1653	40.28	58.86	38.74	50.41	38.73	54.53	54.33	50.17	48.26
	HD3043 (c)	38.28	61.47	43.59	42.89	40.96	46.89	42.84	53.91	46.35
	NIAW3170 (c)	37.28	57.87	39.73	54.69	39.93	50.34	49.22	58.10	48.40
	HD3369	36.83	58.23	45.51	48.44	37.50	47.75	51.88	61.70	48.48
	DBW296 (c)	37.92	57.95	40.14	47.01	40.18	51.61	50.96	59.25	48.13
	PBW644 (c)	37.45	53.54	42.64	43.13	37.25	43.38	44.09	61.80	45.41
	HI1628 (c)	38.70	55.84	41.18	46.60	37.54	49.63	43.95	59.59	46.63
	HUW838 (c)	39.25	62.79	44.75	52.89	39.22	49.39	51.33	52.24	48.98
	Mean	38.66	58.68	42.69	48.04	39.14	48.87	48.94	56.87	47.74
Mean	HI1654	39.98	58.56	44.05	40.92	41.37	42.80	48.76	40.76	44.65
	HI1653	38.74	55.44	37.29	43.70	39.29	52.94	49.15	39.89	44.55
	HD3043 (c)	35.96	55.90	38.23	39.95	39.30	42.42	40.57	35.26	40.95
	NIAW3170 (c)	34.76	54.60	37.68	48.34	38.63	46.20	44.92	45.06	43.77
	HD3369	34.37	57.28	41.80	45.18	37.92	44.99	50.42	41.53	44.19
	DBW296 (c)	36.14	56.50	37.40	42.61	38.26	48.12	47.60	39.66	43.29
	PBW644 (c)	35.30	56.94	37.91	40.02	37.80	40.68	44.22	41.30	41.77
	HI1628 (c)	36.44	55.09	35.61	44.68	39.10	46.43	44.29	37.79	42.43
	HUW838 (c)	37.40	59.22	42.28	48.47	38.70	48.09	49.45	38.53	45.27
	Mean	36.57	56.62	39.14	43.76	38.93	45.85	46.60	39.97	43.43
CD (0.05)		1.07	2.46	1.66	2.30	NS	2.65	3.26	3.08	0.66
		0.79	2.21	1.77	1.94	1.24	1.85	1.92	3.42	0.70
		NS	3.82	NS	NS	NS	3.21	3.33	5.93	NS
		NS	4.09	NS	NS	NS	3.67	4.06	6.09	NS
Date of Sowing:		30.11.2021	02.11.2021	10.11.2021	26.10.2021	10.11.2021	25.10.2021	02.11.2021	05.11.2021	
Date of Harvesting:		22.03.2022	25.04.2022	10.04.2022	14.04.2022	28.04.2022	15.04.2022	07.04.2022	25.03.2022	

Genotype	RIR-TS-TAS						Pooled	2021-22	
	Level of Irrigation							Mean	Rk
	Zero	Rk	One	Rk	Two	Rk			
<b>Yield, q/ha</b>									
HI1654	39.44	3	45.53	3	48.99	1	44.65	2	
HI1653	39.75	2	45.65	2	48.26	5	44.55	3	
HD3043 (c)	35.96	9	40.53	9	46.35	8	40.95	9	
NIAW3170 (c)	38.22	5	44.71	5	48.40	4	43.77	5	
HD3369	38.96	4	45.12	4	48.48	3	44.19	4	
DBW296 (c)	37.36	7	44.38	6	48.13	6	43.29	6	
PBW644 (c)	37.33	8	42.57	8	45.41	9	41.77	8	
HI1628 (c)	37.50	6	43.17	7	46.63	7	42.43	7	
HUW838 (c)	39.81	1	47.01	1	48.98	2	45.27	1	
Mean	38.26		44.30		47.74		43.43		
CD (0.05)	Irrigation (A) 0.66		Genotype (B) 0.70		B within A NS		A within B NS		
<b>Earhead/sq.m.</b>									
HI1654	333	2	357	6	379	4	356	3	
HI1653	302	9	337	9	350	9	329	9	
HD3043 (c)	320	6	359	4	387	2	356	4	
NIAW3170 (c)	331	3	377	1	393	1	367	1	
HD3369	321	5	360	3	368	6	350	6	
DBW296 (c)	325	4	363	2	372	5	353	5	
PBW644 (c)	315	7	349	7	351	8	338	7	
HI1628 (c)	313	8	343	8	351	7	336	8	
HUW838 (c)	333	1	359	5	381	3	357	2	
Mean	321		356		370		349		
CD (0.05)	Irrigation (A) 5.76		Genotype (B) 6.56		B within A NS		A within B NS		
<b>1000 grains weight, g</b>									
HI1654	35.37	5	37.05	7	38.36	8	36.93	6	
HI1653	38.99	1	41.65	1	43.01	1	41.22	1	
HD3043 (c)	31.55	9	33.61	9	35.08	9	33.41	9	
NIAW3170 (c)	37.20	2	39.23	2	40.24	4	38.89	2	
HD3369	36.59	3	38.34	3	40.76	3	38.56	3	
DBW296 (c)	35.10	6	38.24	4	39.30	5	37.55	5	
PBW644 (c)	34.49	8	36.25	8	38.45	7	36.40	8	
HI1628 (c)	35.77	4	38.15	5	40.92	2	38.28	4	
HUW838 (c)	34.70	7	37.38	6	38.61	6	36.90	7	
Mean	35.53		37.77		39.41		37.57		
CD (0.05)	Irrigation (A) 0.46		Genotype (B) 0.61		B within A NS		A within B NS		
<b>Grains/earhead</b>									
HI1654	34.97	5	36.66	1	36.19	1	35.94	1	
HI1653	34.93	6	33.95	7	33.70	7	34.20	6	
HD3043 (c)	36.66	1	35.02	3	36.06	2	35.91	2	
NIAW3170 (c)	32.90	9	32.11	9	32.80	9	32.61	9	
HD3369	33.99	7	33.96	6	33.51	8	33.82	8	
DBW296 (c)	33.96	8	33.37	8	34.51	5	33.95	7	
PBW644 (c)	35.27	3	34.41	5	34.76	4	34.81	4	
HI1628 (c)	35.03	4	34.66	4	34.39	6	34.69	5	
HUW838 (c)	35.86	2	36.38	2	35.06	3	35.77	3	
Mean	34.84		34.50		34.55		34.63		
CD (0.05)	Irrigation (A) NS		Genotype (B) 1.09		B within A NS		A within B NS		

Centres: Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Ludhiana, Pantnagar and Sriganaganagar

Among test entries, HI1654 (44.65q/ha), HI1653 (44.55 q/ha) and HD3369 (44.19 q/ha) ranked second, third and fifth, respectively, in yield on mean basis. Irrigation level and genotypes interaction was significant for grain yield. Test entry HI1653 ranked first in producing the boldest grains (41.22 g thousand grains weight) and test entry HI1654 produced the highest number of grains per earhead (35.94); however, the maximum earhead density (367/sqm) was reported in

check genotype NIAW 3170(c). The centre wise data are presented in Tables 2.4.1 to 2.4.9 in Annexure-I.

### **High Yield Potential Trial**

This experiment was conducted to maximise the wheat yield with target yield of 8 t/ha by using higher level of inorganic and organic fertilisers combined with spraying of growth retardant to control lodging. Experiment consists of two nutrient management treatments viz. recommended doses of fertilizers (RDF) and 150% RDF + 15 t FYM/ha + two sprays as tank mix-Chlormequat chloride (Lihocin) @ 0.2% + tebuconazole (Folicur 430 SC) @ 0.1% of commercial product dose at first node and flag leaf stage, in main plots and nine high yielding wheat genotypes {DBW370, PBW872, DBW371, DBW372, DBW187(c), DBW303(c), DBW327(c), DBW332(c) and HD3086(c)} in sub plots having three replications. The experiment was conducted at six centres namely Gurdaspur, Hisar, Karnal, Ludhiana, BISA Ladowal and Pantnagar. The sowing was done using normalized seed rate of 100 kg/ha (adjusted considering 1000 grains weight as 38 g). Irrigation and weed control measures were applied as per recommended package of practices for the concerned zone.

The centrewise yield and zonal mean yield are shown in Table 2.5. For pooled analysis, the data of Hisar and Karnal centres only were considered and rest four centre (Gurdaspur, Ludhiana, BISA Ladowal and Pantnagar) were not considered for pooled analysis due to low mean yield (<65 q/ha) at highest fertility level. The pooled analysed data of two centres presented in Table 2.6 showed significant effect of fertiliser application on grain yield and yield attributes. The grain yield enhanced significantly with increased fertiliser doses. Addition of 150% RDF and two sprays of growth retardants increased the grain yield (66.17 q/ha) significantly as compared to RDF (58.63 q/ha). This increase was to the tune of 12.9% over RDF. This showed that growth retardant in combination with fungicide tebuconazole was more effective for control of lodging and enhancing the grain yield. The application of growth retardant significantly increased the earheads/sqm and grains/earhead; however, it reduced the plant height as compared to recommended fertiliser application. This confirms the hypothesis that growth retardant reduced the height and at the same time produced more tillers and biomass that resulted in increased grain yield. Test entry PBW872 ranked first on mean yield basis with yield of 67.73 q/ha, which was significantly higher than other genotypes. This genotype also yielded 70.85 q/ha under 150% RDF + 15 t FYM/ha + two sprays of growth regulators at first node and flag leaf stage which was higher than other varieties. High yield in PBW872 was due to its bolder grains (49.45 g thousand grains weight). The second and third ranked high yielding genotypes were DBW371 (65.28 q/ha) and DBW327(c) (65.06 q/ha), respectively on mean yield basis. Centre wise data are presented in Annexure-I in Tables 2.6.1 to 2.6.6.

<b>Table 2.5. North Western Plain Zone</b>		<b>SPL-IR-ES-HYPT Centrewise Yield, q/ha</b>		<b>2021-22</b>
<b>Nutrient Management</b>	<b>Genotype</b>	<b>Hisar</b>	<b>Karnal</b>	<b>Zonal mean</b>
Rec NPK	DBW370	59.08	63.52	61.30
	DBW187 (c )	59.93	56.14	58.04
	HD3086 (c )	58.88	46.86	52.87
	DBW327 (c )	61.77	61.57	61.67
	DBW332 (c )	56.02	58.98	57.50
	DBW303 (c )	50.54	52.15	51.34
	DBW371	63.16	62.74	62.95
	PBW872	66.05	63.16	64.61
	DBW372	56.77	58.01	57.39
	Mean	59.13	58.13	58.63
150% Rec NPK+FYM+GR	DBW370	65.61	69.73	67.67
	DBW187 (c )	67.76	67.16	67.46
	HD3086 (c )	62.79	63.95	63.37
	DBW327 (c )	64.76	72.12	68.44
	DBW332 (c )	62.31	65.93	64.12
	DBW303 (c )	58.54	62.85	60.70
	DBW371	66.60	68.60	67.60
	PBW872	68.47	73.23	70.85
	DBW372	63.10	67.58	65.34
	Mean	64.44	67.91	66.17
Mean	DBW370	62.35	66.63	64.49
	DBW187 (c )	63.84	61.65	62.75
	HD3086 (c )	60.83	55.40	58.12
	DBW327 (c )	63.27	66.85	65.06
	DBW332 (c )	59.17	62.45	60.81
	DBW303 (c )	54.54	57.50	56.02
	DBW371	64.88	65.67	65.28
	PBW872	67.26	68.19	67.73
	DBW372	59.93	62.80	61.36
	Mean	61.79	63.02	62.40
CD (0.05)	NM (A)	2.16	3.22	1.08
	Genotype(B)	2.76	3.21	2.08
	B within A	NS	NS	NS
	A within B	NS	NS	NS
Date of Sowing:		25.10.2021	31.10.2021	
Date of Harvesting:		10.04.2022	14.04.2022	

Table 2.6. North Western Plain Zone		SPL-IR-ES-HYPT			Pooled	2021-22
Genotype	Nutrient Management (NM)				Mean	Rk
	Rec NPK	Rk	150% Rec NPK+FYM + GR	Rk		
<b>Yield, q/ha</b>						
DBW370	61.30	4	67.67	3	64.49	4
DBW187 (c)	58.04	5	67.46	5	62.75	5
HD3086 (c)	52.87	8	63.37	8	58.12	8
DBW327 (c)	61.67	3	68.44	2	65.06	3
DBW332 (c)	57.50	6	64.12	7	60.81	7
DBW303 (c)	51.34	9	60.70	9	56.02	9
DBW371	62.95	2	67.60	4	65.28	2
PBW872	64.61	1	70.85	1	67.73	1
DBW372	57.39	7	65.34	6	61.36	6
Mean	58.63		66.17		62.40	
CD (0.05)	NM (A) 1.08		Genotype (B) 2.08	B within A NS	A within B NS	
<b>Earhead/sq.m.</b>						
DBW370	399	8	431	7	415	7
DBW187 (c)	455	1	476	1	465	1
HD3086 (c)	435	3	451	4	443	3
DBW327 (c)	412	5	433	5	422	5
DBW332 (c)	383	9	409	9	396	9
DBW303 (c)	403	7	426	8	415	8
DBW371	405	6	431	6	418	6
PBW872	430	4	451	3	440	4
DBW372	437	2	459	2	448	2
Mean	418		441		429	
CD (0.05)	NM (A) 5.93		Genotype (B) 21.03	B within A NS	A within B NS	
<b>1000 grains weight, g</b>						
DBW370	42.18	7	39.74	8	40.96	7
DBW187 (c)	47.79	3	46.16	3	46.97	3
HD3086 (c)	45.40	5	41.58	6	43.49	5
DBW327 (c)	47.51	4	45.55	4	46.53	4
DBW332 (c)	44.38	6	42.30	5	43.34	6
DBW303 (c)	41.76	9	39.84	7	40.80	8
DBW371	49.84	2	47.27	2	48.55	2
PBW872	50.34	1	48.57	1	49.45	1
DBW372	41.82	8	37.23	9	39.52	9
Mean	45.67		43.14		44.40	
CD (0.05)	NM (A) 0.52		Genotype (B) 0.81	B within A 1.15	A within B 1.18	
<b>Grains/earhead</b>						
DBW370	36.57	1	39.73	1	38.15	1
DBW187 (c)	27.16	9	31.39	9	29.28	9
HD3086 (c)	28.10	8	34.61	6	31.36	7
DBW327 (c)	31.81	4	35.15	5	33.48	5
DBW332 (c)	33.92	2	37.23	3	35.58	3
DBW303 (c)	31.39	5	36.33	4	33.86	4
DBW371	31.37	6	33.37	7	32.37	6
PBW872	30.11	7	32.45	8	31.28	8
DBW372	32.44	3	38.85	2	35.65	2
Mean	31.43		35.46		33.44	
CD (0.05)	NM (A) 0.91		Genotype (B) 2.36	B within A NS	A within B NS	

<b>Plant Height, cm</b>							
DBW370	101.95	8	94.48	5	98.21	7	
DBW187 (c)	106.31	1	95.20	3	100.75	2	
HD3086 (c)	102.11	7	91.75	9	96.93	9	
DBW327 (c)	100.88	9	94.93	4	97.90	8	
DBW332 (c)	102.99	6	93.67	8	98.33	6	
DBW303 (c)	104.00	3	96.41	2	100.21	3	
DBW371	106.14	2	98.14	1	102.14	1	
PBW872	103.25	5	94.17	6	98.71	5	
DBW372	103.71	4	93.72	7	98.71	4	
Mean	103.48		94.72		99.10		
	NM (A)		Genotype (B)	B within A	A within B		
CD (0.05)	1.42		1.29	1.82	2.14		
Centers: Hisar and Karnal							



## **North Eastern Plains Zone**

The North Eastern Plains Zone (NEPZ) is the second most important wheat growing zone of the country consisting of Assam, Bihar, Jharkhand, Orissa, eastern parts of UP and West Bengal. In all eleven centres namely *Ayodhya*, Burdwan, Coochbehar, IARI Pusa Bihar, Kalyani, Kanpur, Ranchi, RPCAU Pusa, RAU Sabour, Shillongani and Varanasi are actively involved in coordinated research activities. Soils of this zone are sandy to clay loam having organic carbon contents varying from 0.39 per cent at Kanpur to 1.2 per cent at Shillongani. The soils of this zone are low in available nitrogen, medium in available phosphorus and potash. Wheat production and productivity in this zone are more dependent on weather conditions during the crop season. The temperature is an important factor affecting the wheat productivity. Rainfall received varied from 56.3 mm at Varanasi to 371.7 mm at IARI Pusa Bihar during the wheat season starting from November 2021 to April, 2022. The rainfall (November to April) received in decreasing order was Shillongani (370.4 mm) followed by Sabour (266.1 mm), Burdwan (229 mm), Kanpur (208.7 mm), Ranchi (189.8 mm), Kalyani (128.04 mm), Coochbehar (73.2 mm), Ayodhya (67.8) and Varanasi (56.3 mm). The maximum and minimum temperatures at different locations from November to April were 40.7°C and 5.7 °C at Ayodhya, 39.9 °C and 11.3 °C at Burdwan, 34.3 °C and 9.2 °C at Coochbehar, 37.9°C and 7.6 °C at IARI Pusa Bihar, 39.1°C and 9.9°C at Kalyani, 42.2°C and 7.1°C at Kanpur, 39.2°C and 3.6°C at Ranchi, 40.0°C and 8.7°C at Sabour, 34.2°C and 7.6°C at Shillongani and 40.9 °C and 6.7 °C at Varanasi, respectively.

### **EVALUATION UNDER DIFFERENT GROWING CONDITIONS**

The performance of test genotypes was evaluated under irrigated timely sown conditions at different locations and the results are summarized here under;

#### **Irrigated Timely Sown**

Three test entries HD 3411, PBW 826 and HD 3406 were evaluated against five checks *viz.* HD 2967(c), HD 3086 (c), HD 3249 (c), HD 2733 (c) and DBW 187(c) at nine locations (Ayodhya, Coochbehar, Kalyani, Kanpur, Ranchi, RPCAU Pusa, Sabour, Shillongani and Varanasi) under timely (5<sup>th</sup> November to 11<sup>th</sup> November) and late (10<sup>th</sup> December to 16<sup>th</sup> December) sown conditions. The data of Ayodhya, Kalyani, Kanpur, RPCAU Pusa and Sabour, were not considered in pooled analysis due to low mean yield (<45 q/ha under timely sown conditions). The trial was conducted in split plot design with dates of sowing in main plots and genotypes in sub plots. The sowing was done using the normalized (adjusted considering 1000 grains weight of 38 g) seed rate of 100 kg/ha at a row-to-row spacing of 20 cm. Nitrogen was applied in three splits (1/3<sup>rd</sup> at sowing, 1/3<sup>rd</sup> at first irrigation i.e. at 20-25

days after sowing and 1/3<sup>rd</sup> at second irrigation i.e. 40-45 days after sowing), whereas full phosphorus and potash was applied as basal.

The centrewise yield and zonal mean yield are shown in Table 3.1. The pooled data are presented in Table 3.2 and the centre wise data are in Annexure-I as Tables 3.2.1 to 3.2.9. Timely sowing registered higher yield of all genotypes compared to late sowing and on mean basis, yield declined by 10.03% when sowing was delayed from timely to late sowing condition. The yield decline was due to significant reduction in 1000 grains weight under late sown condition as compared to timely sown condition. On mean basis, the check variety HD 2733 was the highest yielder (50.45 q ha<sup>-1</sup>) and recorded significantly higher grain yield compared to all checks except DBW 187 and one test entry PBW 826. The check variety HD 2733 also recorded maximum effective tillers (331 earheads/sq.m). The maximum grains/earhead were observed in test entry HD 3406 (40.57 grains/earhead) followed by PBW 826 (39.37 grains/earhead). The check variety DBW 187 produced the boldest grains having mean 1000 grains weight of 45.73 g.

<b>Table 3.1. North Eastern Plains Zone</b>		<b>IR-TS-DOS-TAS Centrewise Yield, q/ha</b>				<b>2021-22</b>
<b>Date of Sowing</b>	<b>Genotypes</b>	<b>Coochbehar</b>	<b>Ranchi</b>	<b>Shillongani</b>	<b>Varanasi</b>	<b>Zonal mean</b>
Timely	HD 3411	43.67	54.16	42.66	47.08	46.89
	HD 2967 (C)	52.60	62.61	38.00	45.49	49.68
	HD 3086 (C)	51.07	49.22	41.61	44.41	46.58
	PBW 826	52.03	60.85	40.58	51.86	51.33
	HD 3406	40.60	61.00	39.89	49.72	47.80
	HD 3249(C)	40.47	48.40	42.97	52.49	46.08
	HD 2733 (C)	54.60	62.47	44.87	53.31	53.81
	DBW 187 (C)	51.97	56.77	46.98	47.96	50.92
	Mean	48.38	56.94	42.20	49.04	49.14
Late	HD 3411	41.47	47.76	40.52	41.09	42.71
	HD 2967 (C)	47.13	53.66	36.77	32.44	42.50
	HD 3086 (C)	50.77	39.57	41.09	46.91	44.58
	PBW 826	49.90	48.46	40.91	49.72	47.25
	HD 3406	41.80	53.87	38.23	34.25	42.04
	HD 3249(C)	40.23	40.04	41.90	48.57	42.69
	HD 2733 (C)	52.13	49.17	42.53	44.49	47.08
	DBW 187 (C)	44.47	42.33	45.24	47.33	44.84
	Mean	45.99	46.86	40.90	43.10	44.21
Mean	HD 3411	42.57	50.96	41.59	44.08	44.80
	HD 2967 (C)	49.87	58.14	37.39	38.97	46.09
	HD 3086 (C)	50.92	44.39	41.35	45.66	45.58
	PBW 826	50.97	54.66	40.75	50.79	49.29
	HD 3406	41.20	57.43	39.06	41.98	44.92
	HD 3249(C)	40.35	44.22	42.44	50.53	44.38
	HD 2733 (C)	53.37	55.82	43.70	48.90	50.45
	DBW 187 (C)	48.22	49.55	46.11	47.65	47.88
	Mean	47.18	51.90	41.55	46.07	46.67
CD (0.05)	Sowing (A)	1.59	5.20	0.57	2.56	
	Genotype (B)	3.73	4.77	1.64	1.96	
	B within A	NS	NS	NS	2.78	
	A within B	NS	NS	NS	3.00	
Date of Sowing	Timely	15.11.2021	08.11.2021	05.11.2021	10.11.2021	
	Late	10.12.2021	06.12.2021	10.12.2021	10.12.2021	
Date of Harvesting:		31.03.2022	15.03.2022	31.03.2022	05.04.2022	
		16.04.2022	15.04.2022	16.04.2022	09.04.2022	

Table 3.2. North Eastern Plains Zone		IR-TS-DOS-TAS		Pooled	2021-22	
Genotype	Date of Sowing				Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HD 3411	46.89	6	42.71	5	44.80	7
HD 2967 (C)	49.68	4	42.50	7	46.09	4
HD 3086 (C)	46.58	7	44.58	4	45.58	5
PBW 826	51.33	2	47.25	1	49.29	2
HD 3406	47.80	5	42.04	8	44.92	6
HD 3249(C)	46.08	8	42.69	6	44.38	8
HD 2733 (C)	53.81	1	47.08	2	50.45	1
DBW 187 (C)	50.92	3	44.84	3	47.88	3
Mean	49.14		44.21		46.67	
CD (0.05)	Sowing (A) 0.96		Genotype (B) 3.20		B within A NS	A within B NS
<b>Earhead/sqm</b>						
HD 3411	308	5	339	1	324	3
HD 2967 (C)	340	1	312	3	326	2
HD 3086 (C)	316	3	304	4	310	4
PBW 826	309	4	292	7	300	5
HD 3406	284	7	293	6	288	7
HD 3249(C)	276	8	277	8	276	8
HD 2733 (C)	330	2	332	2	331	1
DBW 187 (C)	290	6	294	5	292	6
Mean	306		305		306	
CD (0.05)	Sowing (A) NS		Genotype (B) 21		B within A NS	A within B NS
<b>Grains/Earhead</b>						
HD 3411	37.83	5	32.67	8	35.25	8
HD 2967 (C)	37.42	8	38.21	3	37.82	3
HD 3086 (C)	37.55	7	37.31	4	37.43	5
PBW 826	39.43	2	39.31	2	39.37	2
HD 3406	41.74	1	39.40	1	40.57	1
HD 3249(C)	38.59	3	36.35	5	37.47	4
HD 2733 (C)	37.69	6	35.23	7	36.46	7
DBW 187 (C)	38.39	4	35.43	6	36.91	6
Mean	38.58		36.74		37.66	
CD (0.05)	Sowing (A) NS		Genotype (B) NS		B within A NS	A within B NS
<b>1000 Grains Weight, g</b>						
HD 3411	43.19	6	40.15	5	41.67	6
HD 2967 (C)	40.19	8	36.51	8	38.35	8
HD 3086 (C)	43.26	5	40.10	6	41.68	5
PBW 826	44.46	4	42.03	3	43.25	4
HD 3406	41.87	7	38.19	7	40.03	7
HD 3249(C)	45.84	2	43.84	2	44.84	2
HD 2733 (C)	45.61	3	41.93	4	43.77	3
DBW 187 (C)	47.43	1	44.04	1	45.73	1
Mean	43.98		40.85		42.41	
CD (0.05)	Sowing (A) 0.61		Genotype (B) 1.88		B within A NS	A within B NS

### **Irrigated Late Sown**

Three test entries DBW 316, PBW 833 and PBW 835 were evaluated against four checks viz. HI1563(c), HI1621(c), HD3118(c) and DBW 107(c) at nine locations (Ayodhya, Coochbehar, Kalyani, Kanpur, Ranchi, RPCAU Pusa, Sabour, Shillongani and Varanasi) under late (10<sup>th</sup> December to 16<sup>th</sup> December) and very late (1<sup>st</sup> Jan. to 7<sup>th</sup> Jan.) sown conditions. The data of Kanpur and RPCAU Pusa were not considered in pooled analysis due to low mean yield (<35 q/ha under late sown conditions). The trial was conducted in split plot design with dates of sowing in main plots and genotypes in sub plots. The sowing was done using the normalized (adjusted considering 1000 grains weight of 38 g) seed rate of 125 kg/ha at a row-to-row spacing of 20 cm. Nitrogen was applied in three splits (1/3<sup>rd</sup> at sowing, 1/3<sup>rd</sup> at first irrigation i.e. at 20-25 days after sowing and 1/3<sup>rd</sup> at second irrigation i.e. 40-45 days after sowing), whereas full phosphorus and potash was applied as basal.

The centrewise yield and zonal mean yield are shown in Table 3.3. The pooled data are presented in Table 3.4 and the centre wise data are in Annexure-I as Tables 3.4.1 to 3.4.9. Late sowing registered higher yield of all genotypes compared to very late sowing and on mean basis, yield declined by 25.37% when sowing was delayed from late to very late sowing condition. The yield decline was due to significant reduction in earheads/sq.m, grains/earhead and 1000 grains weight under very late sown condition as compared to late sown condition. On mean basis, the test entry PBW 835 was the highest yielder (36.07 q ha<sup>-1</sup>) and was at par with all other test entries and checks. The check variety HI 1563 recorded the maximum effective tillers (332 earheads/sq.m). The maximum grains/earhead were observed in check variety DBW 107(30.88 grains/earhead) followed by PBW 833 (30.45 grains/earhead). The test entry DBW 316 produced the boldest grains having mean 1000 grains weight of 38.10 g.

<b>Table 3.3. North Eastern Plains Zone</b>		<b>IR-LS-DOS-TAS</b>				<b>Centrewise Yield, q/ha</b>			<b>2021-22</b>
<b>Date of Sowing</b>	<b>Genotypes</b>	<b>Ayodhya</b>	<b>Coochbehar</b>	<b>Kalyani</b>	<b>Ranchi</b>	<b>Sabour</b>	<b>Shillongani</b>	<b>Varanasi</b>	<b>Zonal mean</b>
Late	DBW316	40.31	36.57	27.66	45.95	36.26	42.19	41.69	38.66
	HI1563(c)	42.69	40.57	34.02	47.97	32.33	45.41	44.97	41.14
	PBW833	39.92	40.53	33.03	46.85	31.41	36.03	46.51	39.18
	HI1621(c)	44.86	35.20	26.70	51.80	35.33	38.47	45.00	39.62
	HD3118 (c)	44.28	46.00	24.83	46.85	32.48	41.94	48.71	40.73
	PBW835	45.47	44.70	30.48	44.14	39.23	43.66	45.47	41.88
	DBW107 (c)	42.10	43.20	28.11	47.97	35.58	46.09	48.26	41.62
	Mean	42.80	40.97	29.26	47.36	34.66	41.97	45.80	40.40
Very Late	DBW316	32.54	19.73	24.74	37.86	23.89	41.71	31.68	30.31
	HI1563(c)	33.73	22.33	27.16	37.19	20.52	43.72	31.47	30.88
	PBW833	33.15	18.50	23.58	36.53	23.06	40.07	33.01	29.70
	HI1621(c)	35.71	18.93	20.40	41.69	19.34	40.28	30.24	29.51
	HD3118 (c)	34.92	19.23	21.17	36.73	23.97	41.24	33.07	30.05
	PBW835	35.90	21.77	24.32	36.18	19.24	42.51	31.97	30.27
	DBW107 (c)	33.21	19.33	22.00	36.77	20.78	45.41	34.69	30.31
	Mean	34.17	19.98	23.34	37.56	21.54	42.13	32.31	30.15
Mean	DBW316	36.43	28.15	26.20	41.90	30.07	41.95	36.69	34.48
	HI1563(c)	38.21	31.45	30.59	42.58	26.42	44.56	38.22	36.01
	PBW833	36.54	29.52	28.30	41.69	27.24	38.05	39.76	34.44
	HI1621(c)	40.29	27.07	23.55	46.74	27.33	39.37	37.62	34.57
	HD3118 (c)	39.60	32.62	23.00	41.79	28.22	41.59	40.89	35.39
	PBW835	40.69	33.23	27.40	40.16	29.24	43.09	38.72	36.07
	DBW107 (c)	37.65	31.27	25.06	42.37	28.18	45.75	41.47	35.96
	Mean	38.49	30.47	26.30	42.46	28.10	42.05	39.05	35.27
CD (0.05)	Date of Sowing (A)	0.56	1.36	1.57	5.00	3.84	NS	0.62	
	Genotype (B)	0.99	2.54	1.92	NS	NS	1.55	0.82	
	B within A	NS	3.60	NS	NS	NS	NS	1.16	
	A within B	NS	3.43	NS	NS	NS	NS	1.14	
Date of Sowing	Late	16.12.2021	15.11.2021	15.12.2021	01.12.2021	16.12.2021	11.12.2021	10.12.2021	
	Very Late	03.01.2022	10.12.2021	06.01.2022	02.01.2022	07.01.2022	03.01.2022	01.01.2022	
Date of Harvesting:		04.03. 2022	31.03.2022	02.05.2022	10.04.2022	25.04.2022	08.04.2022	11.04.2022	
		18.04. 2022	16.04.2022	11.05.2022	02.05.2022	30.04.2022	18.04.2022	14.04.2022	

<b>Table 3.4. North Eastern Plains Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Pooled</b>	<b>2021-22</b>	
Genotype	Date of Sowing		Very Late	Rk	Mean	Rk
	Late	Rk				
<b>Yield, q/ha</b>						
DBW316	38.66	7	30.31	3	34.48	6
HI1563(c)	41.14	3	30.88	1	36.01	2
PBW833	39.18	6	29.70	6	34.44	7
HI1621(c)	39.62	5	29.51	7	34.57	5
HD3118 (c)	40.73	4	30.05	5	35.39	4
PBW835	41.88	1	30.27	4	36.07	1
DBW107 (c)	41.62	2	30.31	2	35.96	3
Mean	40.40		30.15		35.27	
	Date of Sowing (A)		Genotype (B)		B within A	A within B
CD (0.05)	0.59		NS		NS	NS
<b>Earhead/sqm</b>						
DBW316	319	7	302	7	310	7
HI1563(c)	350	1	314	4	332	1
PBW833	319	6	310	5	314	6
HI1621(c)	329	4	323	1	326	3
HD3118 (c)	330	3	319	3	324	4
PBW835	340	2	321	2	330	2
DBW107 (c)	325	5	304	6	315	5
Mean	330		313		322	
	Date of Sowing (A)		Genotype (B)		B within A	A within B
CD (0.05)	8		NS		NS	NS
<b>Grains/Earhead</b>						
DBW316	32.16	5	28.40	1	30.28	3
HI1563(c)	30.90	7	27.91	4	29.40	6
PBW833	32.94	2	27.96	2	30.45	2
HI1621(c)	31.90	6	26.03	7	28.97	7
HD3118 (c)	32.82	3	27.29	5	30.06	4
PBW835	32.57	4	26.48	6	29.53	5
DBW107 (c)	33.82	1	27.93	3	30.88	1
Mean	32.44		27.43		29.94	
	Date of Sowing (A)		Genotype (B)		B within A	A within B
CD (0.05)	0.59		NS		NS	NS
<b>1000 Grains Weight, g</b>						
DBW316	39.67	3	36.53	2	38.10	1
HI1563(c)	39.89	1	36.24	4	38.07	2
PBW833	39.17	7	35.87	7	37.52	7
HI1621(c)	39.72	2	35.98	5	37.85	4
HD3118 (c)	39.23	6	35.97	6	37.60	6
PBW835	39.48	4	36.62	1	38.05	3
DBW107 (c)	39.35	5	36.33	3	37.84	5
Mean	39.50		36.22		37.86	
	Date of Sowing (A)		Genotype (B)		B within A	A within B
CD (0.05)	0.33		NS		NS	NS

## **Central Zone**

In central zone, ten centres namely Bilaspur, Dhanduka, Durgapura, Gwalior, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur and Vijapur are actively involved in the coordinated wheat programme of Resource Management during the year 2021-22. The data on soil and various meteorological parameters have been reported under Annexure II and Annexure III, respectively. The soils in this zone vary from sandy loam (Vijapur) to black cotton soils (Dhanduka). Soil was sandy clay loam at Bilaspur, loamy sand at Durgapura, Vertisols at Indore and Jabalpur, medium black at Junagadh and clay loam at Udaipur. Soils were neutral to slightly alkaline in reaction (pH: 7.2 to 8.2). Soils of all the centres were low to medium in organic carbon (0.24-0.93 per cent), low to medium available N (157-301 kg/ha), low to high phosphorus (5.46-42.89 kg/ha) and high in potassium (232-432 kg/ha) at different locations. The rainfall in this zone during the wheat growing season 2021-22 was recorded as 13.29 mm at Bilaspur, 24.9 mm at Dhanduka, 83.1 mm at Durgapura, 115.8 mm at Indore, 120.8 mm at Jabalpur, 77.6 mm at Junagadh, 52.2 mm at Powarkheda, 20.5 mm at Bilaspur, 220.8 mm at Udaipur and 31.6 mm at Vijapur. The average maximum and minimum temperatures were 29.3 and 12.8 °C at Bilaspur, 32.3 and 17.0 °C at Dhanduka, 28.7 and 14.4 °C at Durgapura, 30.2 and 14.7 °C at Indore, 29.6 and 13.1 °C at Jabalpur, 33.1 and 17.5 °C at Junagadh, 32.6 and 11.7 °C at Powarkheda, 30.5 and 11.3 °C at Udaipur and 31.8 and 13.1 °C at Vijapur.

In this zone, four coordinated trials were conducted viz. performance of new wheat genotypes at different dates of sowing under irrigated (timely & late, late & very late), restricted irrigation conditions and high yield potential trial.

### **EVALUATION OF GENOTYPES UNDER DIFFERENT GROWING CONDITIONS**

#### **Irrigated Timely Sown**

Three test entries (HI 1650, MACS 6768 and MP 3535) were evaluated against four check varieties (HI 1544, GW 322, GW 513 and HI 1636) under timely and late sown conditions. The trial was conducted at eight centres (Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur) in split plot design with date of sowing in main plots and genotypes in sub plots. The sowing was done using the normalized (adjusted considering 1000 grains weight as 38 g) seed rate of 100 kg/ha with row to row spacing of 20 cm. Recommended rate of nitrogen, phosphorus and potash (120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) were applied. Full dose of phosphorus and potash and 1/3<sup>rd</sup> N were applied as basal dose and remaining 2/3<sup>rd</sup> N was applied in two equal splits during first and second irrigations.

The centrewise yield and zonal mean are shown in Table 4.1. The pooled analysis of eight centres (Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur and Vijapur) is presented in Table 4.2. The centre wise data are presented in Tables 4.2.1 to 4.2.8 of Annexure-I. The perusal of data in Table 4.2 revealed that the test entry MACS 6768 (48.08 q/ha) ranked 3<sup>rd</sup> which was significantly inferior than check variety HI 1544, which ranked 1<sup>st</sup> with significantly higher yield (50.43 q/ha). Test entry HI 1650 ranked fourth (47.77 q/ha) and MP 3535 ranked seventh (41.36 q/ha). On an average basis, there was significant increase in grain yield (11.2%) when crop was sown under timely sown conditions compared to late sown conditions. Higher number of grains per ear head was main reason for maximum yield of check variety HI 1544 as compared to other entry and check genotypes. Interactions between sowing time and genotypes were found significant for yield, earheads/m<sup>2</sup> and grains/earhead.

### **Irrigated Late Sown**

Test entry HD 3407 was evaluated against five check varieties (HD2932, HI1634, MP3336, HD2864, CG1029) under late and very late sown conditions. The trial was conducted at eight centres (Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur) in split plot design with date of sowing in main plots and genotypes in sub plots. The sowing was done using the higher (adjusted considering 1000 grains weight as 38 g) seed rate of 125 kg/ha with a row to row spacing of 20 cm. Recommended rate of nitrogen, phosphorus and potash for late sown conditions (90:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) were applied. Full dose of phosphorus and potash and 1/3<sup>rd</sup> N was applied as basal dose and remaining 2/3<sup>rd</sup> N was applied in two equal splits during first and second irrigations.

The centrewise yield and zonal mean are presented in Table 4.3. The pooled analysis of eight centres (Bilaspur, Gwalior, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur and Vijapur) is presented in Table 4.4. The centre wise data are presented in Tables 4.4.1 to 4.4.8 of Annexure-I. The perusal of data in Table 4.4 revealed that the test entry HD 3407 (41.61 q/ha) ranked 3<sup>rd</sup> which is statistically at par with check varieties CG 1029 (42.09 q/ha) and HD 2864 (41.86 q/ha) which ranked first and second, respectively. On an average basis, there was significantly higher yield (33.31%) when crop sown under late sown conditions compared to very late sown conditions. The significantly higher thousand grain weight was the reason for maximum yield of check variety CG 1029 as compared to other entry and check varieties. Interaction between sowing time and genotypes was found significant for yield, earheads/m<sup>2</sup> and thousand grains weight.



Table 4.1. Central Zone		IR-TS-DOS-TAD				Centrewise			Yield, q/ha		2021-22
Sowing Time	Genotypes	Bilaspur	Durgapura	Indore	Jabalpur	Jungagadh	Powarkheda	Udaipur	Vijapur	Zonal Mean	
Timely	HI1650	43.21	45.23	55.37	48.78	55.25	51.71	55.89	46.83	50.28	
	MACS6768	46.64	46.55	52.77	46.20	52.14	46.84	55.49	53.71	50.04	
	MP3535	41.42	49.23	45.20	39.29	42.18	31.25	48.67	44.00	42.65	
	GW513 (I)	48.08	44.23	52.53	53.16	53.12	53.78	52.36	54.54	51.48	
	HI1544 (C)	46.77	53.69	54.33	57.03	53.65	57.67	53.67	52.13	53.62	
	GW322 (C)	44.73	52.37	46.33	41.31	54.73	43.38	54.94	51.21	48.63	
	HI1636 (I)	42.12	52.61	51.57	45.29	47.22	45.79	45.14	52.50	47.78	
	Mean	44.71	49.13	51.16	47.29	51.19	47.20	52.31	50.70	49.21	
Late	HI1650	36.25	43.26	50.27	46.12	52.86	37.22	52.20	43.92	45.26	
	MACS6768	39.16	41.97	48.10	44.21	52.70	45.78	50.06	46.92	46.11	
	MP3535	32.45	31.01	48.50	41.64	50.68	34.37	43.67	38.13	40.06	
	GW513 (I)	41.24	40.81	51.20	50.51	58.38	48.43	47.56	43.42	47.69	
	HI1544 (C)	40.37	32.99	49.27	53.30	56.99	55.51	43.04	46.50	47.24	
	GW322 (C)	38.86	33.65	46.10	37.02	56.35	30.79	50.93	43.33	42.13	
	HI1636 (I)	34.82	32.64	50.43	41.64	51.39	41.11	37.33	41.54	41.36	
	Mean	37.59	36.62	49.12	44.92	54.19	41.89	46.40	43.39	44.27	
Mean	HI1650	39.73	44.24	52.82	47.45	54.05	44.47	54.05	45.38	47.77	
	MACS6768	42.90	44.26	50.43	45.20	52.42	46.31	52.78	50.31	48.08	
	MP3535	36.94	40.12	46.85	40.46	46.43	32.81	46.17	41.06	41.36	
	GW513 (I)	44.66	42.52	51.87	51.84	55.75	51.11	49.96	48.98	49.58	
	HI1544 (C)	43.57	43.34	51.80	55.16	55.32	56.59	48.35	49.31	50.43	
	GW322 (C)	41.80	43.01	46.22	39.17	55.54	37.09	52.94	47.27	45.38	
	HI1636 (I)	38.47	42.63	51.00	43.47	49.31	43.45	41.23	47.02	44.57	
	Mean	41.15	42.87	50.14	46.11	52.69	44.55	49.35	47.05	46.74	
CD (0.05)	Sowing (A)	4.77	1.32	3.24	4.53	9.31	1.48	0.94	3.62	0.94	
	Genotypes (B)	1.95	2.65	1.89	3.05	2.84	3.25	4.89	2.89	1.05	
	B within A	2.75	3.74	2.67	4.32	4.02	4.59	6.92	4.09	1.47	
	A within B	3.80	3.55	3.12	4.81	6.63	4.34	6.43	4.35	1.64	
Date of sowing	Timely	12.11.2021	18.11.2021	12.11.2021	14.11.2021	16.11.2021	12.11.2021	16.11.2021	13.11.2021		
	Late	03.12.2021	08.12.2021	7.12.2021	06.12.2021	07.12.2021	04.12.2021	06.12.2021	04.12.2021		
Date of Harvesting		04.04.2022	21.3.2022	19.3.2022	26.03.2022	10.03.2022	21.03.2022	26.03.2022	03.03.2022		
		18.04.2022	02.4.2022	29.3.2022	12.04.2022	17.03.2022	31.03.2022	01.04.2022	22.03.2022		

Table 4.2. Central Zone		IR-TS-DOS-TAD		Pooled		2021-22	
Genotype	Sowing Time						
	Timely	Rk	Late	Rk	Mean	Rk	
<b>Yield, q/ha</b>							
HI1650	50.28	3	45.26	4	47.77	4	
MACS6768	50.04	4	46.11	3	48.08	3	
MP3535	42.65	7	40.06	7	41.36	7	
GW513 (I)	51.48	2	47.69	1	49.58	2	
HI1544 (C)	53.62	1	47.24	2	50.43	1	
GW322 (C)	48.63	5	42.13	5	45.38	5	
HI1636 (I)	47.78	6	41.36	6	44.57	6	
Mean	49.21		44.27		46.74		
Sowing Time (A)		Genotype (B)		B within A		A within B	
CD (0.05)	0.95	1.04		1.47		1.64	
<b>Earhead/sq.m.</b>							
HI1650	372	5	345	6	359	6	
MACS6768	370	6	352	4	361	4	
MP3535	414	1	373	2	393	1	
GW513 (I)	374	4	347	5	360	5	
HI1544 (C)	384	3	379	1	382	2	
GW322 (C)	390	2	363	3	377	3	
HI1636 (I)	344	7	326	7	335	7	
Mean	378		355		367		
Sowing Time (A)		Genotype (B)		B within A		A within B	
CD (0.05)	4.93	7.7		10.88		11.16	
<b>Grains/earhead</b>							
HI1650	28.6	4	30.4	4	29.5	4	
MACS6768	29.4	3	32.3	1	30.8	2	
MP3535	24.1	7	27.0	7	25.6	7	
GW513 (I)	28.2	6	29.9	5	29.0	5	
HI1544 (C)	32.1	1	30.5	3	31.3	1	
GW322 (C)	29.9	2	31.6	2	30.7	3	
HI1636 (I)	28.2	5	27.8	6	28.0	6	
Mean	28.6		29.9		29.3		
Sowing Time (A)		Genotype (B)		B within A		A within B	
CD (0.05)	0.73	0.99		1.41		1.48	
<b>1000 Grains Weight, g</b>							
HI1650	48.73	3	44.19	3	46.46	3	
MACS6768	47.12	4	42.09	5	44.61	4	
MP3535	45.19	5	41.01	6	43.10	6	
GW513 (I)	50.24	2	47.01	2	48.63	2	
HI1544 (C)	44.87	6	42.23	4	43.55	5	
GW322 (C)	42.74	7	38.80	7	40.77	7	
HI1636 (I)	50.61	1	47.29	1	48.95	1	
Mean	47.07		43.23		45.15		
Sowing Time (A)		Genotype (B)		B within A		A within B	
CD (0.05)	0.45	0.86		NS		NS	
Centres: Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur							

Table 4.3. Central Zone		IR-LS-DOS-TAS				Centrewise		Yield, q/ha		2021-22
Sowing Time	Genotype	Bilaspur	Durgapura	Indore	Jabalpur	Jungagadh	Powarkheda	Udaipur	Vijapur	Zonal Mean
Late	HD2932 (C)	37.69	39.31	55.17	49.53	57.30	46.18	48.00	49.79	47.87
	HI1634 (C)	35.54	30.14	53.70	51.07	55.52	47.49	50.18	46.75	46.30
	MP3336 (C)	34.08	34.28	53.73	43.15	54.01	38.76	45.97	47.63	43.95
	HD2864 (C)	38.08	41.83	48.93	51.22	55.16	45.90	45.78	42.33	46.15
	CG1029 (C)	39.90	37.28	56.53	53.36	58.85	43.31	46.93	52.13	48.53
	HD3407	38.41	40.82	57.13	57.33	56.15	53.44	41.49	47.71	49.06
	Mean	37.28	37.28	54.20	50.94	56.17	45.85	46.39	47.72	46.98
Very Late	HD2932 (C)	32.82	27.27	44.27	32.40	37.42	32.33	39.07	31.08	34.58
	HI1634 (C)	31.55	29.36	39.47	32.51	38.41	36.90	45.70	31.92	35.73
	MP3336 (C)	28.98	34.94	43.03	28.74	38.77	29.97	37.18	28.46	33.76
	HD2864 (C)	34.62	32.99	42.67	39.25	42.90	41.21	36.57	30.33	37.57
	CG1029 (C)	29.74	31.89	45.57	35.57	37.94	38.89	35.14	30.50	35.65
	HD3407	29.67	23.99	45.87	33.76	39.56	36.90	35.78	27.79	34.17
	Mean	31.23	30.07	43.48	33.71	39.17	36.03	38.24	30.01	35.24
Mean	HD2932 (C)	35.25	33.29	49.72	40.97	47.36	39.26	43.53	40.44	41.23
	HI1634 (C)	33.55	29.75	46.58	41.79	46.97	42.20	47.94	39.33	41.01
	MP3336 (C)	31.53	34.61	48.38	35.94	46.39	34.37	41.58	38.04	38.85
	HD2864 (C)	36.35	37.41	45.80	45.24	49.03	43.56	41.17	36.33	41.86
	CG1029 (C)	34.82	34.59	51.05	44.46	48.39	41.10	41.04	41.31	42.09
	HD3407	34.04	32.40	51.50	45.55	47.86	45.17	38.64	37.75	41.61
	Mean	34.25	33.68	48.84	42.32	47.67	40.94	42.32	38.87	41.11
CD (0.05)	Sowing (A)	2.60	1.98	2.60	0.92	6.64	2.80	3.83	5.36	0.80
	Genotype(B)	3.28	2.07	1.93	2.98	2.50	3.53	3.32	2.10	0.94
	B within A	4.64	2.92	2.73	4.22	3.54	4.99	4.70	2.97	1.32
	A within B	4.50	2.91	2.93	3.89	5.08	4.84	4.85	4.17	1.44
Date of Sowing	Late	03.12.2021	08.12.2021	04.12.2021	05.12.2021	07.12.2021	06.12.2021	04.12.2021	13.11.2021	
	V. Late	24.12.2021	30.12.2021	28.12.2021	12.26.2021	27.12.2021	27.12.2021	25.12.2021	04.12.2021	
Date of Harvesting	Late	10.04.2022	02.04.2022	02.04.2022	12.04.2022	17.03.2022	10.04.2022	24.03.2022	03.03.2022	
	V. Late	17.04.2022	10.04.2022	09.04.2022	24.04.2022	28.03.2022	19.04.2022	06.04.2022	22.03.2022	

<b>Table 4.4. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Pooled</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	47.87	3	34.58	4	41.23	4	
HI1634 (C)	46.30	4	35.73	2	41.01	5	
MP3336 (C)	43.95	6	33.76	6	38.85	6	
HD2864 (C)	46.15	5	37.57	1	41.86	2	
CG1029 (C)	48.53	2	35.65	3	42.09	1	
HD3407	49.06	1	34.17	5	41.61	3	
Mean	46.98		35.24		41.11		
	Sowing Time (A)	Genotype (B)		B within A		A within B	
CD (0.05)	0.80	0.94		1.32		1.44	
<b>Earhead/sq.m.</b>							
HD2932 (C)	361	3	318	4	340	4	
HI1634 (C)	338	6	312	6	325	6	
MP3336 (C)	357	4	326	3	342	3	
HD2864 (C)	365	2	344	1	355	1	
CG1029 (C)	356	5	315	5	335	5	
HD3407	370	1	333	2	352	2	
Mean	358		325		341		
	Sowing Time (A)	Genotype (B)		B within A		A within B	
CD (0.05)	4.75	6.84		9.67		9.97	
<b>Grains/earhead</b>							
HD2932 (C)	30.4	4	31.8	2	31.1	3	
HI1634 (C)	32.2	2	32.0	1	32.1	1	
MP3336 (C)	29.3	5	28.5	5	28.9	5	
HD2864 (C)	30.6	3	30.3	4	30.5	4	
CG1029 (C)	29.1	6	27.6	6	28.4	6	
HD3407	32.9	1	30.6	3	31.8	2	
Mean	30.7		30.1		30.4		
	Sowing Time (A)	Genotype (B)		B within A		A within B	
CD (0.05)	0.94	1.33		NS		NS	
<b>1000 Grains Weight, g</b>							
HD2932 (C)	44.81	2	36.05	5	40.43	2	
HI1634 (C)	43.37	3	36.62	4	40.00	4	
MP3336 (C)	42.54	4	38.02	2	40.28	3	
HD2864 (C)	42.31	5	37.47	3	39.89	5	
CG1029 (C)	47.39	1	42.61	1	45.00	1	
HD3407	41.01	6	35.08	6	38.04	6	
Mean	43.57		37.64		40.61		
	Sowing Time (A)	Genotype (B)		B within A		A within B	
CD (0.05)	0.53	0.58		0.82		0.91	

Centres: Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Udaipur, Vijapur

### **Restricted Irrigation**

Four test entries [HI 1655, CG 1036, HI 8830 (d) and DDW 55 (d)] were evaluated against five check varieties (MP 3288, DBW 110, HI 8627 (d), DDW 47 (d), HI 8823) with no, one (CRI stage) and two (CRI and boot leaf stage) irrigations in split plot design with three replications. Irrigation levels were kept in main plots and the genotypes in the sub-plots. The trial was conducted at six locations (Bilaspur, Durgapura, Indore, Jabalpur, Powarkheda and Udaipur). The data of Durgapura centre were not included in pooled analysis due to low mean trial yield and the data of Udaipur centre were not included in pooled analysis due to improper data reporting. Full dose of recommended NPK (90:60:40) was applied as basal in no irrigation treatment and 1/3<sup>rd</sup> nitrogen, full phosphorus (60 kg P<sub>2</sub>O<sub>5</sub>/ha) and potash (40 kg K<sub>2</sub>O/ha) were applied at the time of sowing and remaining N was top dressed at 1<sup>st</sup> irrigation stage in other two main plots. Weed control measures were followed as per the recommended practice. The normalized seed rate used was 100 kg/ha (considering the 1000 grains weight of 38 g).

The centrewise yield and zonal mean are presented in Table 4.5. The pooled analysis presented in Table 4.6 showed that increasing number of irrigations successively produced significantly higher grain yield. One and two irrigation application yielded 17.0% and 25.9% higher grain yield, respectively over no irrigation. All the yield attributing parameters were significantly improved with increased level of irrigation. So, the yield increase was due to cumulative effect of all yield attributing parameters. The check variety DBW 110 ranked 1<sup>st</sup> (38.43 q/ha) followed by test entry CG 1036 (38.33 q/ha) and HI 8830 (d) (38.11 q/ha) and these three genotypes remained statistically at par but significantly higher as compared to other genotypes. Significantly higher number of grains/earhead was reason for maximum yield of check variety DBW 110. Interaction between irrigation levels and genotypes was not found significant for any parameter. Centre wise data are given in Tables 4.6.1 to 4.6.6 of Annexure I.

### **High Yield Potential Trial**

This experiment was conducted to maximise the wheat yield using higher level of inorganic and organic fertilisers and spraying of growth retardant for control of lodging. Experiment consists of two fertiliser treatments viz. NM1 {recommended doses of fertilizers (RDF)} and NM2 {150% NPK + 15 t FYM/ha + two sprays as tank mix-Chlormequat chloride (Lihocin) @0.2% + tebuconazole (Folicur 430 SC) @0.1%} of commercial product dose at first node and flag leaf (tank mix application) stage in main plots. Sub plots consist of four high yielding wheat genotypes (GW 322, DBW187, DBW 303, DBW 372). The trial was conducted in split

<b>Table 4.5. Central Zone</b>		<b>RIR-TS-TAD Centrewise</b>		<b>Yield, q/ha</b>		<b>2021-22</b>
<b>Irrigation</b>	<b>Genotypes</b>	<b>Bilaspur</b>	<b>Indore</b>	<b>Jabalpur</b>	<b>Powarkheda</b>	<b>Zonal mean</b>
Zero	MP3288 (C)	29.44	32.63	31.30	25.32	29.67
	HI1655	28.57	37.23	29.62	24.45	29.97
	DDW47(d)(C)	27.76	38.93	28.41	23.63	29.68
	HI8823(l)	25.59	33.10	26.93	21.46	26.77
	CG1036	35.30	37.50	34.58	29.92	34.33
	DBW110 (C)	34.04	39.23	35.21	31.18	34.92
	HI8830(d)	30.89	41.87	30.70	26.77	32.56
	DDW55(d)	28.98	39.33	29.03	22.00	29.84
	HI8627(d)(C)	26.12	39.80	27.19	24.86	29.49
	Mean	29.63	37.74	30.33	25.51	30.80
One	MP3288 (C)	35.75	37.43	36.66	31.63	35.37
	HI1655	33.58	41.70	35.00	29.46	34.93
	DDW47(d)(C)	32.74	41.63	32.70	28.62	33.92
	HI8823(l)	30.25	43.73	29.77	26.13	32.47
	CG1036	40.66	42.40	41.04	35.11	39.80
	DBW110 (C)	39.24	38.30	40.66	36.54	38.68
	HI8830(d)	37.37	52.07	38.29	33.25	40.24
	DDW55(d)	34.49	43.43	35.92	27.45	35.32
	HI8627(d)(C)	31.58	40.03	32.09	30.37	33.52
	Mean	35.07	42.30	35.79	30.95	36.03
Two	MP3288 (C)	37.28	43.17	37.66	33.15	37.82
	HI1655	34.86	54.07	37.32	30.73	39.25
	DDW47(d)(C)	34.31	45.30	33.77	30.19	35.89
	HI8823(l)	31.89	50.37	31.53	27.77	35.39
	CG1036	42.10	43.43	41.17	36.78	40.87
	DBW110 (C)	40.91	45.80	42.13	37.98	41.70
	HI8830(d)	38.37	54.43	39.08	34.25	41.53
	DDW55(d)	36.51	49.93	37.65	29.22	38.33
	HI8627(d)(C)	33.34	48.33	38.36	32.39	38.11
	Mean	36.62	48.31	37.63	32.50	38.77
Mean	MP3288 (C)	34.16	37.74	35.21	30.03	34.29
	HI1655	32.34	44.33	33.98	28.21	34.72
	DDW47(d)(C)	31.60	41.96	31.63	27.48	33.17
	HI8823(l)	29.24	42.40	29.41	25.12	31.54
	CG1036	39.35	41.11	38.93	33.94	38.33
	DBW110 (C)	38.06	41.11	39.34	35.23	38.43
	HI8830(d)	35.54	49.46	36.02	31.42	38.11
	DDW55(d)	33.33	44.23	34.20	26.22	34.50
	HI8627(d)(C)	30.35	42.72	32.55	29.21	33.71
	Mean	33.78	42.79	34.58	29.65	35.20
CD (0.05)	Irrigation (A)	2.89	1.54	1.96	2.89	0.98
	Genotype (B)	2.29	1.72	2.56	2.29	1.10
	B within A	3.96	2.98	4.43	3.96	NS
	A within B	4.37	3.06	4.45	4.37	NS
Date of Sowing :		30.10.2021	31.10.2021	06.11.2021	07.11.2021	
Date of Harvesting :		10.03.2022	22.03.2022	20.03.2022	15.03.2022	

Table 4.6. Central Zone

Genotype	RIR-TS-TAD		Pooled		2021-22			
	Zero	Rk	One	Rk	Two	Rk	Mean	Rk
<b>Yield, q/ha</b>								
MP3288 (C)	29.67	7	35.37	4	37.82	7	34.29	6
HI1655	29.97	4	34.93	6	39.25	4	34.72	4
DDW47(d)(C)	29.68	6	33.92	7	35.89	8	33.17	8
HI8823(l)	26.77	9	32.47	9	35.39	9	31.54	9
CG1036	34.33	2	39.80	2	40.87	3	38.33	2
DBW110 (C)	34.92	1	38.68	3	41.70	1	38.43	1
HI8830(d)	32.56	3	40.24	1	41.53	2	38.11	3
DDW55(d)	29.84	5	35.32	5	38.33	5	34.50	5
HI8627(d)(C)	29.49	8	33.52	8	38.11	6	33.71	7
Mean	30.80		36.03		38.77		35.20	
CD (0.05)	Irrigation (A) 0.98	Genotypes (B) 1.1	B within A NS		A within B NS			
<b>Earhead/sq.m.</b>								
MP3288 (C)	266	4	284	4	294	5	282	4
HI1655	264	5	280	6	298	4	281	5
DDW47(d)(C)	255	8	277	7	278	9	270	8
HI8823(l)	255	9	273	8	280	8	269	9
CG1036	290	1	314	1	319	1	307	1
DBW110 (C)	280	2	286	3	300	3	289	2
HI8830(d)	268	3	288	2	308	2	288	3
DDW55(d)	258	7	283	5	293	6	278	6
HI8627(d)(C)	260	6	272	9	286	7	273	7
Mean	266		284		295		282	
CD (0.05)	Irrigation (A) 6.14	Genotypes (B) 6.3	B within A NS		A within B NS			
<b>Grains /earhead</b>								
MP3288 (C)	28.6	5	30.9	4	31.3	4	30.3	5
HI1655	28.5	7	30.5	5	31.7	3	30.2	6
DDW47(d)(C)	30.4	1	29.6	7	31.2	5	30.4	4
HI8823(l)	27.7	9	30.1	6	30.5	8	29.4	7
CG1036	28.5	6	29.2	8	28.8	9	28.9	9
DBW110 (C)	30.0	2	33.4	1	33.4	2	32.3	1
HI8830(d)	28.7	4	32.5	2	30.9	6	30.7	3
DDW55(d)	28.2	8	29.0	9	30.7	7	29.3	8
HI8627(d)(C)	29.2	3	31.1	3	33.4	1	31.2	2
Mean	28.9		30.7		31.3		30.3	
CD (0.05)	Irrigation (A) 1.13	Genotypes (B) 1.03	B within A NS		A within B NS			
<b>1000 Grains Weight, g</b>								
MP3288 (C)	41.19	8	41.78	8	42.70	8	41.89	8
HI1655	42.31	5	42.52	5	42.76	7	42.53	5
DDW47(d)(C)	40.90	9	42.82	4	43.07	5	42.26	6
HI8823(l)	41.37	7	41.58	9	43.18	4	42.04	7
CG1036	43.22	4	44.57	2	45.76	1	44.52	2
DBW110 (C)	43.74	3	42.06	6	42.98	6	42.92	4
HI8830(d)	44.35	1	44.39	3	44.95	2	44.56	1
DDW55(d)	43.79	2	44.91	1	44.60	3	44.43	3
HI8627(d)(C)	41.62	6	42.03	7	41.51	9	41.72	9
Mean	42.50		42.96		43.50		42.99	
CD (0.05)	Irrigation (A) 0.55	Genotypes (B) 0.76	B within A NS		A within B NS			

Centres: Bilaspur, Indore, Jabalpur, Powarkheda

plot design with three replications at five centres namely BISA Jabalpur, Jabalpur, Powarkheda, Udaipur and Vijapur. The sowing was done using normalized seed rate of 100 kg/ha (adjusted considering 1000 grains weight as 38 g). Irrigation and weed control measures were followed as per recommended package of practices for the concerned zone. The data from Powarkheda were not included in pooled analysis due to low mean yield.

The centrewise yield and zonal mean are shown in Table 4.7. The pooled analysis showed significant effect of fertiliser application and growth regulators on grain yield and yield attributes (Table 4.8). The grain yield enhanced significantly with increasing fertiliser doses. Addition of 15 t FYM/ha with 150% RDF significantly increased the grain yield (70.02 q/ha) as compared to RDF (62.26 q/ha). This increase was to the tune of 12.5% as compared with RDF. The dose of 150%NPK + 15 t FYM/ha+GR significantly (12.6%) enhanced number of earhead/m<sup>2</sup>. (437) compared to RDF (388). The application of growth retardant significantly decreased plant height (91.6 cm) over no use (95 cm). This showed that growth retardant in combination with fungicide tebuconazole was effective for control of lodging and enhancing the grain yield owing to more tillering.

<b>Table 4.7. Central Zone</b>		<b>SPL-IR-ES-HYPT</b>		<b>Centrewise</b>	<b>Yield, q/ha</b>	<b>2021-22</b>
<b>Nutrient management (NM)</b>	<b>Genotypes</b>	<b>BISA</b>		<b>Udaipur</b>	<b>Vijapur</b>	<b>Zonal Mean</b>
		<b>Jabalpur</b>	<b>Jabalpur</b>			
NM1	GW322	75.25	74.01	54.57	54.21	64.51
	DBW187	75.01	69.50	53.21	52.31	62.51
	DBW303	69.49	73.40	52.02	52.71	61.90
	DBW372	73.75	62.66	48.28	55.71	60.10
	Mean	73.38	69.89	52.02	53.73	62.26
NM2	GW322	80.00	80.14	65.28	60.83	71.56
	DBW187	82.40	77.11	63.72	59.08	70.58
	DBW303	83.46	82.43	59.84	60.13	71.46
	DBW372	72.15	69.19	58.82	65.79	66.49
	Mean	79.50	77.22	61.91	61.46	70.02
Mean	GW322	77.63	77.07	59.93	57.52	68.04
	DBW187	78.71	73.31	58.46	55.70	66.54
	DBW303	76.47	77.92	55.93	56.42	66.68
	DBW372	72.95	65.92	53.55	60.75	63.29
	Mean	76.44	73.55	56.97	57.60	66.14
CD (0.05)	NM (A)	10.26	6.49	3.93	4.93	2.18
	Genotypes (B)	6.32	3.14	2.53	5.75	2.22
	B within A	8.94	4.44	3.58	8.14	NS
	A within B	9.95	5.52	3.92	7.66	NS
Date of Sowing		10.11.2021	05.11.2021	11.11.2021	04.11.2021	
Date of Harvesting		04.04.2022	12.04.2022	18.03.2022	03.03.2022	



Genotype	SPL-IR-ES-HYPT				Pooled Mean	2021-22 Rk
	Nutrient Management		Rk			
	NM1	Rk	NM2	Rk		
<b>Yield, q/ha</b>						
GW322	64.51	1	71.56	1	68.04	1
DBW187	62.51	2	70.58	3	66.54	3
DBW303	61.90	3	71.46	2	66.68	2
DBW372	60.10	4	66.49	4	63.29	4
Mean	62.26		70.02		66.14	
CD (0.05)	NM (A) 2.18		Genotype (B) 2.22		B within A NS	A within B NS
<b>Earhead/sq.m.</b>						
GW322	400	1	437	2	418	1
DBW187	389	3	445	1	417	2
DBW303	366	4	433	3	399	4
DBW372	399	2	431	4	415	3
Mean	388		437		412	
CD (0.05)	NM (A) 7.69		Genotype (B) 12.53		B within A NS	A within B NS
<b>Grains/earhead</b>						
GW322	35.5	2	34.7	2	35.1	2
DBW187	32.8	4	32.6	4	32.7	4
DBW303	39.3	1	38.2	1	38.8	1
DBW372	33.3	3	34.3	3	33.8	3
Mean	35.2		34.9		35.1	
CD (0.05)	NM (A) 1.79		Genotype (B) NS		B within A NS	A within B NS
<b>1000 grains wt, g</b>						
GW322	46.67	2	47.54	2	47.10	2
DBW187	49.87	1	49.76	1	49.82	1
DBW303	43.41	4	43.55	4	43.48	4
DBW372	45.55	3	45.33	3	45.44	3
Mean	46.38		46.54		46.46	
CD (0.05)	NM (A) 1.0		Genotype (B) NS		B within A NS	A within B NS
<b>Plant Height, cm</b>						
GW322	92.51	4	91.12	4	91.82	4
DBW187	96.98	1	91.19	3	94.09	1
DBW303	94.97	3	91.77	2	93.37	3
DBW372	95.46	2	92.20	1	93.83	2
Mean	94.98		91.57		93.27	
CD (0.05)	NM (A) 0.81		Genotype (B) 1.23		B within A 1.74	A within B 1.69
<b>Biomass, q/ha</b>						
GW322	143.68	3	158.28	3	150.98	2
DBW187	144.57	1	158.59	2	151.58	1
DBW303	139.46	4	159.98	1	149.72	3
DBW372	143.98	2	152.02	4	148.00	4
Mean	142.93		157.22		150.07	
CD (0.05)	NM (A) 4.48		Genotype (B) NS		B within A NS	A within B NS
<b>Physiological maturity, Days</b>						
GW322	119	4	121	4	120	4
DBW187	120	3	122	2	121	3
DBW303	121	2	121	3	121	2
DBW372	125	1	126	1	126	1
Mean	121		122		122	
CD (0.05)	NM (A) 0.76		Genotype (B) 0.68		B within A NS	A within B NS

Centres: BISA Jabalpur, Jabalpur, Udaipur, Vijapur

## **Peninsular Zone**

In Peninsular zone, four centres (Akola, Dharwad, Niphad and Pune) were actively engaged in research activities of coordinated wheat agronomy programme. The data on weather and soil parameters are reported in Annexure II and Annexure III, respectively. The soils of this zone fall under the order vertisols and predominantly are clayey in nature with low to high organic carbon ranging between 0.27-0.94 per cent. The available soil nitrogen is low in content ranging between (113 to 272 kg N/ha); while the content of phosphorus is generally high (up to 43 kg/ha) except in few cases where it falls under medium category. The potash content in soil is very high (up to 939 kg/ha) except in few cases where it falls under low category. The soils of this region are predominantly alkaline in reaction. Majority of rainfall received was in the months of October-November except a few showers which were received during later stages in the crop season. The maximum rainfall received was 441.8 mm at Dharwad followed by 325.3 mm at Pune, 132.0 mm at Niphad and 117 mm at Akola. The average maximum and minimum temperatures were 41.1 °C and 8.4 °C at Akola, 39.3 °C and 6.0 °C at Niphad, 38.9 °C and 10.3 °C at Pune, and 36.2 °C and 11.0 °C at Dharwad.

### **EVALUATION UNDER DIFFERENT GROWING CONDITIONS**

The performance of genotypes was evaluated under timely and late sown conditions at different locations and the results are summarized under the following heads:

#### **Irrigated Timely Sown**

In this trial, two *durum* entries MACS4100(d) and HI8826(d) were evaluated against three check varieties MACS3949(d), DDW48(d) and GW322. The trial was conducted to evaluate the performance of timely sown genotypes under timely and late sown conditions at four locations (Akola, Dharwad, Niphad and Pune) in split plot design with sowing time in main plots and genotypes in sub plots with three replications. The allowed period for timely and late sown conditions was kept as 5<sup>th</sup> to 11<sup>th</sup> Nov and 26<sup>th</sup> Nov to 02<sup>nd</sup> Dec, respectively. Sowing was done using the normalized (adjusted considering 1000 grains weight as 38 g) seed rate of 100 kg/ha. The dose of NPK fertilizers was maintained as 120:60:40 kg/ha with 1/3<sup>rd</sup> N, full P and K as basal application during sowing and application of remaining 2/3<sup>rd</sup> N equally in first and second irrigation.

The centrewise and zonal yield of the trial is given in Table 5.1. The results of pooled analysis and centrewise data of yield and yield attributes are presented in Table 5.2 and Annexure-I (Tables 5.2.1 to 5.2.4), respectively. The data from Dharwad and Pune centre were not considered for pooled analysis due to low mean yield under timely sown condition.

The perusal of pooled data revealed that grain yield slightly reduced on shifting the sowing from timely to late condition; however, difference was not significant. The mean grain yield under timely and late sown conditions was found to be 55.76 and 53.13 q/ha, respectively. In terms of yield, the test entry HI8826(d) showed superiorly on timely sowing (63.01 q/ha) and overall basis (57.87 q/ha). It was followed by check variety MACS3949(d) with a mean yield of 55.37 q/ha. The mean yield of other test entry MACS4100(d) was ranked fifth on over all basis. There was a significant decline in thousand grains weight upon shifting the sowing time from timely to late conditions.

<b>Table 5.1. Peninsular Zone</b>		<b>IR-TS-DOS-TAD</b>	<b>Centrewise Yield, q/ha</b>	<b>2021-22</b>
<b>Sowing time</b>	<b>Genotype</b>	<b>Akola</b>	<b>Niphad</b>	<b>Zonal mean</b>
Timely	MACS4100(d)	38.63	59.12	48.88
	HI8826(d)	56.49	69.52	63.01
	GW322 (C)	50.99	58.89	54.94
	MACS3949(d)(C)	48.23	63.70	55.97
	DDW48(d)(C)	47.16	64.84	56.00
	Mean	48.30	63.21	55.76
Late	MACS4100(d)	56.96	50.89	53.93
	HI8826(d)	46.29	59.19	52.74
	GW322 (C)	58.13	47.26	52.70
	MACS3949(d)(C)	58.89	50.67	54.78
	DDW48(d)(C)	54.92	48.05	51.49
	Mean	55.04	51.21	53.13
Mean	MACS4100(d)	47.80	55.01	51.40
	HI8826(d)	51.39	64.36	57.87
	GW322 (C)	54.56	53.08	53.82
	MACS3949(d)(C)	53.56	57.18	55.37
	DDW48(d)(C)	51.04	56.44	53.74
	Mean	51.67	57.21	54.44
CD (0.05)	Sowing time (A)	NS	3.76	NS
	Genotype (B)	NS	NS	3.43
	B within A	6.98	NS	4.85
	A within B	7.91	NS	4.92
Date of Sowing:	Late	10.11.2021	10.11.2021	
	Very Late	26.11.2021	01.12.2021	
Date of Harvesting:	Late	29.03.2022	09.03.2022	
	Very Late	06.04.2022	30.03.2022	

<b>Table 5.2. Peninsular Zone</b>		<b>IR-TS-DOS-TAD</b>			<b>Pooled</b>	<b>2021-22</b>
Genotype	Sowing time				Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
MACS4100(d)	48.88	5	53.93	2	51.40	5
HI8826(d)	63.01	1	52.74	3	57.87	1
GW322 (C)	54.94	4	52.70	4	53.82	3
MACS3949(d)(C)	55.97	3	54.78	1	55.37	2
DDW48(d)(C)	56.00	2	51.49	5	53.74	4
Mean	55.76		53.13		54.44	
Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	NS	3.43		4.85	4.92	
<b>Earheads/sqm</b>						
MACS4100(d)	382	5	391	5	386	5
HI8826(d)	459	1	435	1	447	1
GW322 (C)	405	4	399	2	402	4
MACS3949(d)(C)	413	3	394	4	403	3
DDW48(d)(C)	445	2	398	3	421	2
Mean	421		403		412	
Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	NS	20.38		NS	NS	
<b>Grains/Earhead</b>						
MACS4100(d)	32.78	1	31.49	2	32.13	1
HI8826(d)	25.60	4	23.84	5	24.72	5
GW322 (C)	31.19	2	31.40	3	31.30	2
MACS3949(d)(C)	29.99	3	31.82	1	30.90	3
DDW48(d)(C)	25.32	5	31.32	4	28.32	4
Mean	28.98		29.97		29.48	
Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	NS	1.46		2.07	2.53	
<b>1000 Grains Weight, g</b>						
MACS4100(d)	40.07	5	44.22	3	42.14	5
HI8826(d)	54.35	1	51.78	1	53.07	1
GW322 (C)	44.85	4	43.13	4	43.99	4
MACS3949(d)(C)	45.63	3	44.28	2	44.96	3
DDW48(d)(C)	50.37	2	42.63	5	46.50	2
Mean	47.05		45.21		46.13	
Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	0.47	1.24		1.75	1.62	
<b>Centres:</b>	Akola, Niphad					

### Irrigated Late Sown

In this trial, one genotype DBW320 was evaluated against four checks (HD3090, HI1633, HD2932 and RAJ4083). The trial was conducted to assess the performance of late sown genotype under different sowing time (late and very late) at four locations (Akola, Dharwad, Niphad and Pune). A split plot design with sowing time in main plots and genotypes in sub plots with three replications was considered for experimentation. The allowed period for late and very late sown conditions was kept as 26<sup>th</sup> Nov to 02<sup>nd</sup> Dec and 17<sup>th</sup> to 23<sup>rd</sup> Dec, respectively. The nominal seed rate was kept as 125 kg/ha (adjust seed rate considering

1000 grains weight as 38 g) for late sown conditions. The dose of NPK fertilizers was kept as 90:60:40 kg/ha with 1/3<sup>rd</sup> N, full P and K as basal application during the sowing and application of remaining 2/3<sup>rd</sup> N equally in two splits at first and second irrigation.

The centrewise and zonal yield of the trial is given in Table 5.3. The results of pooled analysis and centrewise data of yield and yield attributes are presented in Table 5.4 and Annexure-I (Tables 5.4.1 to 5.4.4), respectively. The data from Dharwad centre were not taken into account for pooled analysis due to low mean yield under late sown condition. The results of pooled data showed that grain yield declined drastically on changing the sowing time from late to very late condition due to reduced earheads and thousand grains weight under very late sown condition. The mean grain yield under late and very late sown conditions was observed to be 55.53 and 41.68 q/ha, respectively. The mean yield of test entry DBW320 was found as 48.97 q/ha, which was significantly inferior to the best check variety HD 2932 (52.66 q/ha).

<b>Table 5.3. Peninsular Zone</b>		<b>IR-LS-DOS-TAS</b>	<b>Centrewise</b>	<b>Yield, q/ha</b>	<b>2021-22</b>
<b>Sowing time</b>	<b>Genotype</b>	<b>Akola</b>	<b>Niphad</b>	<b>Pune</b>	<b>Zonal mean</b>
Late	HD3090 (C)	58.52	52.13	48.41	53.02
	DBW320	60.25	54.47	53.30	56.01
	HI1633 (C)	53.85	63.46	49.39	55.57
	HD2932 (C)	60.56	65.71	57.16	61.14
	RAJ4083 (C)	56.47	51.66	47.67	51.93
	Mean	57.93	57.49	51.19	55.53
Very Late	HD3090 (C)	32.71	44.07	33.31	36.69
	DBW320	42.22	50.25	33.32	41.93
	HI1633 (C)	45.10	51.37	34.45	43.64
	HD2932 (C)	40.83	52.10	39.58	44.17
	RAJ4083 (C)	45.48	46.37	34.06	41.97
	Mean	41.27	48.83	34.94	41.68
Mean	HD3090 (C)	45.62	48.10	40.86	44.86
	DBW320	51.24	52.36	43.31	48.97
	HI1633 (C)	49.47	57.42	41.92	49.60
	HD2932 (C)	50.69	58.90	48.37	52.66
	RAJ4083 (C)	50.97	49.01	40.86	46.95
	Mean	49.60	53.16	43.07	48.61
CD (0.05)	Sowing time (A)	3.91	3.38	8.70	1.74
	Genotype (B)	NS	4.59	3.87	2.20
	B within A	5.81	NS	NS	NS
	A within B	6.55	NS	NS	NS
Date of Sowing:	Late	26.11.2021	01.12.2021	26.11.2021	
	Very Late	21.12.2021	17.12.2021	17.12.2021	
Date of Harvesting:	Late	29.03.2022	25.03.2022	25.03.2022	
	Very Late	02.04.2022	08.04.2022	25.03.2022	

<b>Table 5.4. Peninsular Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Pooled</b>		<b>2021-22</b>	
Genotype	Sowing time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD3090 (C)	53.02	4	36.69	5	44.86	5	
DBW320	56.01	2	41.93	4	48.97	3	
HI1633 (C)	55.57	3	43.64	2	49.60	2	
HD2932 (C)	61.14	1	44.17	1	52.66	1	
RAJ4083 (C)	51.93	5	41.97	3	46.95	4	
Mean	55.53		41.68		48.61		
	Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	1.74		2.20		NS	NS	
<b>Earheads/sqm</b>							
HD3090 (C)	381	4	339	4	360	4	
DBW320	376	5	330	5	353	5	
HI1633 (C)	395	3	369	1	382	3	
HD2932 (C)	437	1	353	3	395	1	
RAJ4083 (C)	412	2	357	2	385	2	
Mean	400		350		375		
	Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	15.39		23.97		NS	NS	
<b>Grains/Earhead</b>							
HD3090 (C)	32.96	2	31.94	1	32.45	1	
DBW320	31.35	3	29.18	2	30.27	3	
HI1633 (C)	33.62	1	28.69	4	31.16	2	
HD2932 (C)	30.81	4	28.81	3	29.81	4	
RAJ4083 (C)	30.07	5	28.16	5	29.11	5	
Mean	31.76		29.35		30.56		
	Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	1.91		NS		NS	NS	
<b>1000 Grains Weight, g</b>							
HD3090 (C)	43.02	4	36.12	5	39.57	5	
DBW320	48.00	1	44.00	1	46.00	1	
HI1633 (C)	42.59	5	42.28	4	42.43	4	
HD2932 (C)	45.97	2	43.74	2	44.86	2	
RAJ4083 (C)	43.10	3	43.50	3	43.30	3	
Mean	44.54		41.93		43.23		
	Sowing time (A)		Genotype (B)		A within B	B within A	
CD (0.05)	0.60		0.46		0.65	0.82	
<b>Centres:</b>	Akola, Niphad, Pune						

## **PRODUCTION TECHNOLOGIES**

In this section, the results of various experiments on updating the package of practices of various wheat growing zones are presented. Various special coordinated trials on weed control, nano urea, NPK solubilizing microbial consortium, maximizing production, use of sea-weed extract, use of RCTs in soybean-wheat system, lodging management, biofortification and fertigation in wheat were conducted to address the various issues in different wheat growing zones of the country.

### **SPL -1: Efficacy of herbicides against diverse weed flora of wheat.**

Weeds are major problem in wheat production. Chemical weed control is preferred over other weed control methods in wheat. Moreover, wheat is infested with diverse weed flora and for control of complex weed flora herbicide combinations are required. Therefore, keeping these in view an experiment involving twelve weed control treatments was conducted across zones at 17 locations.

The sowing was done using the normalized (adjusted considering 1000 grains weight of 38 g) seed rate of 100 kg/ha at a row-to-row spacing of 20 cm. One third nitrogen, full phosphorus and potash as basal dose as per treatments and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation. Weed control measures were followed as per treatments. Herbicide spraying was done using Knapsack sprayer. The observations were recorded on weed density and weed dry weight at 30, 60 and 90 DAS.

In NHZ, this trial was conducted at two locations (Bajaura and Malan). The pooled analysed yield and yield attributes data of two centres are presented in Table 6.1. The minimum wheat grain yield (31.83 q/ha) was recorded with untreated weedy control on pooled basis. Among herbicide treatments, the maximum grain yield was recorded with pre em. tank mix combination of pendimethalin + pyroxasulfone at 1250 + 127.5 g/ha. If we examine the centrewise performance then among herbicide treatments, the maximum grain yield at Bajaura centre was recorded with Pre em. application of pendimethalin at 1500 g/ha (52.55 q/ha) followed by pre em. tank mix combination of pendimethalin + pyroxasulfone at 1250 + 127.5 g/ha (52.46 q/ha). Whereas, at Malan, the maximum grain yield was recorded with pre-em. tank mix combination of pendimethalin + pyroxasulfone at 1250 + 127.5 g/ha. Among herbicide treatments, at Malan, EPOST application of Pyroxasulfone + metsulfuron @ 127.5 + 4 g/ha recorded lowest weed density and dry weight. Whereas, at Bajaura, pendimethalin at 1500 g/ha recorded the lowest weed density and dry weight.

Table 6.1. Northern Hill Zone	Treatments	Earheads /m <sup>2</sup>	SPL-1	Pooled	2021-22	
			1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha
	PE Pendimethalin @ 1000 g/ha	395	41.89	26.80	43.47	103.55
	PE Pendimethalin @ 1500 g/ha	399	43.48	22.71	38.77	100.29
	PE Pyroxasulfone @ 127.5 g/ha	436	42.36	22.45	40.57	97.55
	PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	423	45.12	24.84	45.92	103.11
	PE Pyroxa+metsulfuron 127.5+4 g/ha	423	42.73	23.79	41.71	94.96
	EPOST Pyroxasulfone@ 127.5 g/ha	408	42.54	22.71	37.99	88.23
	EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	385	40.58	21.69	33.17	79.77
	PE Metribuzin @300 g/ha	420	43.77	23.90	42.21	98.23
	PE Pendi + metribuzin@1250+280 g/ha	415	44.23	25.39	45.30	102.30
	PE Pyroxa + metribuzin@127.5+280 g/ha	409	43.78	25.20	44.31	100.75
	Weedy Check	403	41.02	19.97	31.83	91.52
	Weed free	426	43.85	25.21	45.57	101.47
	CD (0.05)	13.70	0.86	1.93	2.88	4.81

Centres: Bajaura, Malan

Table 6.2(a). North Hill Zone	Treatments	SPL-1		Bajaura		2021-22	
		Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>			
		60	90	60	90		
	PE Pendimethalin @ 1000 g/ha	12.86(166.7)	11.34(128)	4.32(17.9)	6.04(35.8)		
	PE Pendimethalin @ 1500 g/ha	1.00(0)	1.00(0)	1.00(0)	1.00(0)		
	PE Pyroxasulfone @ 127.5 g/ha	12.78(165.3)	11.56(134.7)	6.18(37.4)	7.19(51.5)		
	PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	2.08(4.0)	2.87(8.0)	1.65(2.6)	3.90(14.4)		
	PE Pyroxa+metsulfuron 127.5+4 g/ha	8.71(86.7)	6.61(45.3)	2.61(5.9)	5.11(25.4)		
	EPOST Pyroxasulfone@ 127.5 g/ha	13.8(192.0)	10.39(108.0)	6.48(41.6)	6.67(43.7)		
	EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	12.38(153.3)	9.62(92.0)	6.32(40.3)	6.09(36.6)		
	PE Metribuzin @300 g/ha	8.61(74.7)	8.24(69.3)	3.87(14.4)	4.94(24.2)		
	PE Pendi + metribuzin@1250+280 g/ha	1.00(0)	3.00(16.0)	1.00(0)	1.00(0)		
	PE Pyroxa + metribuzin@127.5+280 g/ha	1.00(0)	1.00(0)	1.00(0)	1.00(0)		
	Weedy Check	22.95(533.3)	16.02(257.3)	9.55(90.9)	11.40(129.5)		
	Weed free	1.00(0)	1.00(0)	1.00(0)	1.00(0)		
	CD(0.05)	1.15	0.91	0.43	0.40		



Table 6.2(b). North Hill Zone	SPL-1	Malan	2021-22	
	Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>	
	60	90	60	90
PE Pendimethalin @ 1000 g/ha	7.64(57.3)	7.19(50.7)	3.92(14.4)	3.92(14.4)
PE Pendimethalin @ 1500 g/ha	6.49(41.2)	6.05(35.7)	2.84(7.1)	2.84(7.1)
PE Pyroxasulfone @ 127.5 g/ha	7.27(51.8)	6.6(42.7)	3.05(8.3)	3.05(8.3)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	7.10(49.5)	6.65(43.3)	3.13(8.8)	3.13(8.8)
PE Pyroxa+metsulfuron 127.5+4 g/ha	7.76(59.3)	7.22(51.2)	3.84(13.8)	3.84(13.8)
EPOST Pyroxasulfone@ 127.5 g/ha	6.81(45.5)	5.86(33.3)	2.96(7.8)	2.96(7.8)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	2.70(6.3)	1.50(1.3)	1.45(1.1)	1.51(1.3)
PE Metribuzin @300 g/ha	7.54(55.8)	5.53(29.7)	2.70(7)	2.70(7.0)
PE Pendi + metribuzin@1250+280 g/ha	6.67(43.5)	6.54(41.8)	2.88(7.3)	2.88(7.3)
PE Pyroxa + metribuzin@127.5+280 g/ha	7.44(54.3)	6.32(39)	3.68(12.6)	3.68(12.6)
Weedy Check	7.44(54.3)	6.63(43)	3.45(10.9)	3.45(10.9)
Weed free	1.00(0)	1.00(0)	1.00(0)	1.00(0)
CD(0.05)	0.38	0.51	0.57	0.57

In NWPZ, this trial was conducted at three centres namely Gurdaspur, Hisar and Jammu. The analysis of pooled data as shown in Table 6.3 and 6.4 revealed that herbicide application produced significant effect on grain yield and yield attributes. The highest yield was obtained under weed free situation (51.93 q/ha) which might be attributed to higher and better use of moisture, light, nutrients and space by the crop plants. Among herbicides, pre-emergence application of pyroxasulfone + metribuzin 127.5+280 g a. i./ha showed the least number of weed count of 16.9 and weed dry weight of 15.4 g/ sq. m. at 90 DAS as compared to values of these traits as 112.6 and 161.5, respectively, under weedy check condition followed by pre-emergence tank mix application of pendimethalin + metribuzin at 1280 + 280 g a.i./ha resulted into less weed count of 16.9 and reduced weed dry weight of 15.4 g/sq. m. at 90 DAS. The centre-wise data of yield and weeds have been given in Table 6.3.1 to 6.3.3 and Table 6.4.1 to 6.4.3 of Annexure-I, respectively.

In NEPZ, this experiment was conducted at four locations (Ayodhya, Ranchi, RPCAU PUSA and Shillongani). The pooled analyzed data of these centres are presented in Table 6.5 and 6.6. The perusal of data revealed that the maximum grain yield (49.2 q/ha) was obtained in weed free condition which was at par to pre-emergence tank mix application of Pendimethalin + metribuzin@1250+280 g a.i./ha, Pre-emergence tank mix application of

Pyroxasulfone + metribuzin@127.5+280 g a.i./ha and early post emergence tank mix application of Pyroxasulfone+ metsulfuron@ 127.5 + 4 g a.i./ha. The weed count and weed dry weight were reduced significantly by pre-emergence tank mix application of Pyroxasulfone + metribuzin@127.5+280 g a.i./ha and pre-emergence tank mix application of Pendimethalin + metribuzin@1250+280 g a.i./ha at all growth stages. The gain in grain yield was due to more earhead density, bold grains, less weed infestation. The yield gain in weed free condition over weedy check was 56.7%. Almost similar trend was observed in plant height and bio-mass yield. The centre-wise data of yield and weeds have been given in Table 6.5.1 to 6.5.4 and Table 6.6.1 to 6.6.4 of Annexure-I, respectively.

**Table 6.3. North Western Plains Zone**

Treatments	Yield, q/ha	SPL-1	Pooled	2021-22		
		Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
PE Pendimethalin @ 1000 g/ha	44.35	363	36.31	33.97	123.01	94.91
PE Pendimethalin @ 1500 g/ha	45.25	374	37.25	32.80	124.57	95.53
PE Pyroxasulfone @ 127.5 g/ha	45.03	372	37.62	32.63	125.54	95.62
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	48.26	375	37.32	34.68	133.00	97.91
PE Pyroxa+metsulfuron 127.5+4 g/ha	46.49	386	37.11	32.99	130.62	96.97
EPOST Pyroxasulfone@ 127.5 g/ha	44.44	367	37.17	32.88	124.30	95.85
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	45.20	363	36.76	34.21	126.84	97.09
PE Metribuzin @300 g/ha	43.63	362	37.56	32.60	120.12	93.84
PE Pendi + metribuzin@1250+280 g/ha	46.37	390	37.21	32.48	126.68	96.62
PE Pyroxa + metribuzin@127.5+280 g/ha	47.04	385	36.94	33.50	126.81	98.27
Weedy Check	34.47	291	34.59	34.56	106.50	88.20
Weed free	51.93	413	38.04	33.73	133.95	100.23
CD (0.05)	2.95	21.09	1.07	2.68	9.57	4.15

**Centres:** Gurdapur, Hisar and Jammu

**Table 6.4. North Western Plains Zone**

Treatments	SPL-1		Pooled		2021-22	
	Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>			
	60	90	60	90		
PE Pendimethalin @ 1000 g/ha	4.79 (22.8)	5.22 (27.2)	4.69 (27.5)	5.80 (39.3)		
PE Pendimethalin @ 1500 g/ha	4.14 (16.5)	4.79 (22.3)	3.88 (17.8)	5.01 (28.0)		
PE Pyroxasulfone @ 127.5 g/ha	4.39 (19.6)	4.78 (23.9)	4.33 (25.1)	5.10 (33.1)		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.79 (14.3)	4.28 (19.1)	3.78 (19.6)	4.61 (26.6)		
PE Pyroxa+metsulfuron 127.5+4 g/ha	4.44 (20.3)	4.85 (24.9)	4.38 (26.1)	5.17 (34.4)		
EPOST Pyroxasulfone@ 127.5 g/ha	4.70 (22.7)	5.16 (27.5)	4.58 (28.3)	5.63 (39.0)		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.37 (19.2)	4.94 (24.9)	4.20 (24.9)	5.53 (36.9)		
PE Metribuzin @300 g/ha	3.88 (15.2)	4.55 (21.4)	3.04 (10.3)	4.76 (23.8)		
PE Pendi + metribuzin@1250+280 g/ha	3.85 (14.1)	4.47 (19.3)	3.34 (12.1)	4.45 (21.1)		
PE Pyroxa + metribuzin@127.5+280 g/ha	3.52 (11.6)	4.19 (16.9)	3.20 (10.8)	3.83 (15.4)		
Weedy Check	9.94 (99.6)	10.50 (112.6)	9.61 (114.7)	11.82 (161.5)		
Weed free	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)		
CD (0.05)	0.39	0.39	0.35	0.46		

**Centres:** Gurdapur, Hisar and Jammu

Table 6.5. North Eastern Plains Zone	Yield, q/ha	SPL-1	Pooled	2021-22	
		Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha
Treatments					
PE Pendimethalin @ 1000 g/ha	43.15	293	40.3	37.6	93.8
PE Pendimethalin @ 1500 g/ha	44.35	303	40.9	33.8	94.6
PE Pyroxasulfone @ 127.5 g/ha	45.08	284	40.9	39.6	92.6
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	45.73	330	41.7	32.7	98.2
PE Pyroxa+metsulfuron 127.5+4 g/ha	47.33	321	41.8	36.1	100.2
EPOST Pyroxasulfone@ 127.5 g/ha	45.13	297	43.0	34.4	94.8
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	47.58	311	42.0	36.2	105.8
PE Metribuzin @300 g/ha	45.40	294	41.2	39.3	96.6
PE Pendi + metribuzin@1250+280 g/ha	48.07	336	41.2	35.4	105.5
PE Pyroxa + metribuzin@127.5+280 g/ha	48.05	338	41.2	34.4	106.4
Weedy Check	31.37	287	39.2	25.6	77.2
Weed free	49.15	347	42.3	31.7	110.2
CD (0.05)	1.56	11.50	1.80	2.90	3.90

**Centres:** Ayodhya, Ranchi, RPCAU PUSA and Shillongani

Table 6.6. North Eastern Plains Zone	Treatments	SPL-1	Pooled	2021-22	
		Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>	
		60	90	60	90
	PE Pendimethalin @ 1000 g/ha	7.8(87.3)	7.0(77.7)	5.1(28.3)	5.1(32.4)
	PE Pendimethalin @ 1500 g/ha	7.1(68.9)	5.7(40.5)	4.2(18.4)	4.0(16.5)
	PE Pyroxasulfone @ 127.5 g/ha	9.2(135.3)	8.1(109.8)	5.7(41.5)	6.0(51.2)
	PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	6.1(45.3)	6.3(62.8)	4.0(15.8)	4.7(28.2)
	PE Pyroxa+metsulfuron 127.5+4 g/ha	9.7(176.7)	9.6(191.9)	5.4(37.2)	6.8(85.1)
	EPOST Pyroxasulfone@ 127.5 g/ha	10.0(162.2)	8.9(135.1)	5.8(39.0)	5.7(42.8)
	EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	10.3(217.5)	9.1(181.8)	6.1(60.8)	6.0(63.8)
	PE Metribuzin @300 g/ha	7.4(81.6)	7.5(95.7)	4.5(22.0)	5.3(39.0)
	PE Pendi + metribuzin@1250+280 g/ha	5.1(31.0)	6.2(61.5)	3.8(15.2)	3.9(16.8)
	PE Pyroxa + metribuzin@127.5+280 g/ha	5.2(32.7)	5.4(43.3)	3.9(15.5)	3.7(14.8)
	Weedy Check	16.2(384.1)	15.9(399.3)	9.6(109.8)	9.8(126.4)
	Weed free	1.0(0.0)	1.0(0.0)	1.0(0.0)	1.0(0.0)
	CD (0.05)	0.7(15.7)	0.7(17.8)	0.4(3.7)	0.4(5.0)

**Centres:** Ayodhya, Ranchi, RPCAU PUSA and Shillongani

In CZ, this trial was conducted at six locations (Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore). The pooled analysis of data of six centres is presented in Table 6.7 and 6.8. The perusal of pooled data revealed that among various herbicide and their combination options, there were significant differences in grain yield and yield attributing characters. Treatment having EPOST tank mix application of Pyroxasulfone + metsulfuron @ 127.5 + 4 g a.i./ha produced significantly higher grain yield (52.30 q/ha), and thousand grains weight (47.33, g) as compared other treatments except weed free. Lesser number of weeds and weed dry weight were recorded at different growth stage of crop under EPOST application of pyroxasulfone + metsulfuron@127.5 g a.i./ha. The centre-wise data of yield

and weeds have been given in Table 6.7.1 to 6.7.6 and Table 6.8.1 to 6.8.6 of Annexure-I, respectively.

Treatments	Yield, g/ha	SPL-1	Pooled	2021-22	
		Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Plant Ht, cm
PE Pendimethalin @ 1000 g/ha	46.2	357.9	42.1	31.7	81.5
PE Pendimethalin @ 1500 g/ha	47.1	365.9	42.6	31.4	82.2
PE Pyroxasulfone @ 127.5 g/ha	49.4	364.4	43.6	32.2	82.4
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	50.5	376.9	44.4	31.9	84.3
PE Pyroxa+metsulfuron 127.5+4 g/ha	49.4	358.7	46.1	31.5	82.2
EPOST Pyroxasulfone@ 127.5 g/ha	48.1	364.3	43.2	31.7	81.4
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	52.3	386.5	47.3	29.6	85.2
PE Metribuzin @300 g/ha	45.1	356.1	43.8	29.7	80.0
PE Pendi + metribuzin@1250+280 g/ha	46.9	358.0	45.6	29.6	80.5
PE Pyroxa + metribuzin@127.5+280 g/ha	48.2	356.6	44.2	31.5	81.1
Weedy Check	35.5	294.7	40.2	30.4	78.0
Weed free	55.6	416.2	47.5	29.4	87.1
CD (0.05)	1.40	10.90	1.20	1.40	2.00

**Centres:** Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore

Treatments	SPL-1	Pooled	2021-22	
	Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>	
	60	90	60	90
PE Pendimethalin @ 1000 g/ha	5.9 (35.6)	5.8 (35.5)	6.6 (52.1)	7.8 (74.6)
PE Pendimethalin @ 1500 g/ha	5.2 (28.5)	5.2 (28.8)	5.7 (40.8)	6.9 (60.1)
PE Pyroxasulfone @ 127.5 g/ha	5.1 (26.8)	5.1 (26.5)	6.2 (49.4)	6.9 (60.3)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	4.6 (20.1)	4.5 (19.6)	5.3 (36.7)	6.1 (51.1)
PE Pyroxa+metsulfuron 127.5+4 g/ha	5.3 (30.1)	5.3 (30.3)	5.9 (45.9)	7.4 (75.3)
EPOST Pyroxasulfone@ 127.5 g/ha	5.7 (34.3)	5.6 (33.6)	6.4 (50.1)	7.6 (73.3)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.4 (19.5)	4.3 (19.2)	5.0 (33.9)	6.0 (54.5)
PE Metribuzin @300 g/ha	5.8 (36.5)	5.9 (38.8)	6.2 (48.4)	7.4 (74.2)
PE Pendi + metribuzin@1250+280 g/ha	5.5 (33.7)	5.6 (40.6)	6.0 (43.6)	8.9 (130.1)
PE Pyroxa + metribuzin@127.5+280 g/ha	5.5 (35.1)	5.7 (40.1)	5.9 (44.5)	8.2 (106.9)
Weedy Check	11.7 (140.4)	12.5 (165.5)	13.3 (246.5)	18.0 (470.2)
Weed free	1.8 (3.2)	1.6 (2.5)	1.9 (3.9)	1.7 (3.1)
CD (0.05)	0.3 (3.6)	0.3 (3.8)	0.4 (11.0)	0.6 (22.4)

**Centres:** Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore

In PZ, this trial was conducted at Dharwad and Pune centres. The analysis of pooled data as shown in Table 6.9 and 6.10 revealed that herbicide application on grain yield and yield attributes produced significant effect. The highest yield was obtained under weed free situation (52.20 q/ha) possibly due to higher uptake of nutrients by the crop and better aeration. Among herbicides, pre-emergence application of pendimethalin @1500 g a.i./ha showed the least number of weed count of 7.03/m<sup>2</sup> and weed dry weight of 5.25 g/m<sup>2</sup> at 90 DAS as compared to values of these traits as 22.08/m<sup>2</sup> and 21.55 g/m<sup>2</sup> at, respectively,

under weedy check condition. Under early post emergence condition, tank mix application of Pyroxasulfone + metsulfuron @127.5 + 4 g a.i./ha resulted into less weed count of 10.98/m<sup>2</sup> and reduced weed dry weight of 8.05 g/m<sup>2</sup> at 90 DAS over data of these traits as 22.08/m<sup>2</sup> and 21.55 g/m<sup>2</sup>, respectively, under weedy check condition. The centre-wise data of yield and weeds have been given in Table 6.9.1 to 6.9.2 and Table 6.10.1 to 6.10.2 of Annexure-I, respectively.

Herbicide	SPL-1		Pooled		2021-22
	Yield, q/ha	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Biomass , q/ha
PE Pendimethalin @ 1000 g/ha	50.33	318	40.13	43.10	101.08
PE Pendimethalin @ 1500 g/ha	49.53	316	43.04	39.41	102.29
PE Pyroxasulfone @ 127.5 g/ha	48.33	341	41.66	39.25	94.89
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	42.41	254	39.59	46.20	86.27
PE Pyroxa+metsulfuron 127.5+4 g/ha	50.66	313	40.72	44.67	101.71
EPOST Pyroxasulfone@ 127.5 g/ha	49.37	324	41.59	38.89	102.47
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	48.59	272	42.67	43.37	96.81
PE Metribuzin @300 g/ha	45.56	325	41.39	36.50	100.08
PE Pendi + metribuzin@1250+280 g/ha	51.97	340	41.94	40.17	103.84
PE Pyroxa + metribuzin@127.5+280 g/ha	48.06	320	40.81	40.81	95.08
Weedy Check	46.00	288	39.15	45.12	95.33
Weed free	52.20	270	41.63	46.69	106.23
CD (0.05)	4.43	35.22	2.61	6.53	7.77

**Centres:** Dharwad, Pune

Treatments	SPL-1		Pooled		2021-22	
	Weed density. No/m <sup>2</sup>		Weed dry weight. g/m <sup>2</sup>			
	60	90	60	90	60	90
PE Pendimethalin @ 1000 g/ha	3.0 (9.17)	2.76 (8.08)	3.16 (318.33)	2.51 (6.43)		
PE Pendimethalin @ 1500 g/ha	2.94 (8.52)	2.64 (7.03)	2.83 (315.67)	2.36 (5.25)		
PE Pyroxasulfone @ 127.5 g/ha	3.15 (9.33)	3.31 (10.78)	3.49 (340.83)	3.16 (9.42)		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.71 (13.78)	3.78 (15.02)	3.81 (253.83)	3.49 (13.40)		
PE Pyroxa+metsulfuron 127.5+4 g/ha	3.08 (8.88)	3.17 (10.03)	3.26 (313.17)	2.68 (6.75)		
EPOST Pyroxasulfone@ 127.5 g/ha	3.93 (15.22)	3.34 (10.85)	3.47 (324.0)	3.25 (9.60)		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.23 (22.22)	3.29 (10.98)	3.85 (272.17)	2.94 (8.05)		
PE Metribuzin @300 g/ha	3.62 (13.03)	3.48 (12.38)	3.57 (325.0)	2.88 (7.45)		
PE Pendi + metribuzin@1250+280 g/ha	2.75 (7.07)	2.89 (7.85)	3.17 (339.83)	2.81 (7.43)		
PE Pyroxa + metribuzin@127.5+280 g/ha	3.20 (9.53)	3.06 (8.48)	3.65 (320.17)	3.79 (14.88)		
Weedy Check	3.75 (16.95)	4.34 (22.08)	4.23 (288.0)	4.55 (21.55)		
Weed free	1.0 (0.0)	1.0 (0.0)	1.0 (270.0)	1.0 (0.0)		
CD (0.05)	0.92 (9.72)	0.73 (5.13)	0.66 (35.22)	0.72 (5.39)		

**Centres:** Dharwad, Pune

### **SPL-2: Sea weed extract usage in wheat**

Sea weed is an important naturally occurring plant nutrients source, and hence its extract is being explored for supplying a variety of naturally available plant nutrients which may play a key role in realizing wheat crop yield potential and thus, making the best out of waste. For exploring the role of sea weed extract in improving nutrients usage in wheat under wheat based cropping systems a field trials were conducted across the wheat growing zones.

In NHZ, this experiment was conducted at two locations (Bajaura and Malan). The perusal of pooled data presented in Table 6.11 revealed that maximum wheat grain yield (47.56 q/ha) was obtained in treatment where wheat crop seed was treated with sea weed extract followed by two foliar spray of sea weed extract 4ml/litre of water at tillering and heading. This treatment resulted in higher yield due to better earhead density (422/sq.m.), heavier grains weight (43.55 g/1000 grains weight), more number of grains per earhead (26.22) and the highest biomass production (107.48 q/ha). Seed treatment with sea weed extract at the rate of 3.0 ml per kg of weed seed before sowing of the crop also resulted in significantly higher grain and biomass yield (Table 6.2) as compared to control (without seed treatment). Mean sea weed extract foliar application response showed significantly higher yield when applied at both tillering and heading stages at 4.0 ml/litre of water as compared to all other stages of crop growth and lower dose (2.0 ml/litre of water) of sea weed extract spray. Except, plant height the interaction effects were non-significant for yield and yield attributes parameters. Centre wise data are given in Annexure- I as Tables 6.11.1 and 6.11.2.

In NWPZ, the experiment on seaweed extract was conducted at three locations (Delhi, Gurdaspur and Jammu). The perusal of pooled analysis data presented in Table 6.12 showed that seed treatment with seaweed extract made significant increase in grain yield (51.65 q/ha) over untreated control (50.92 q/ha). The maximum mean grain yield (53.18 q/ha) was observed with two foliar spray of seaweed extract using 4 ml/lit dose at tillering and heading stages followed by two foliar spray of seaweed extract using 2 ml/lit dose at tillering and heading stages (52.13 q/ha). The mean wheat yield with seed treatment was 1.43% higher than the practice of untreated seed. The centrewise data have been given in Table 6.12.1 to Table 6.12.3 of Annexure-I.

Table 6.11 .Northern Hill Zone

SPL-2

Pooled

2021-22

Foliar spray	Seaweed extract seed treatment				Mean	Rk
	Control	Rk	Seed treatment	Rk		
			Yield, q/ha			
Spray @ 2ml/litre at tillering(T)	38.07	6	41.94	6	40.00	6
Spray @ 4ml/litre at tillering	38.87	5	43.52	4	41.19	5
Spray @ 2ml/litre at heading (H)	40.01	4	43.26	5	41.64	4
Spray @ 4ml/litre at heading	41.19	3	44.73	3	42.96	3
Spray @ 2ml/litre at T & H	42.87	2	44.91	2	43.89	2
Spray @ 4ml/litre at T & H	44.61	1	47.56	1	46.09	1
MEAN	40.94		44.32		42.63	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	0.93		1.97		NS	NS
			Earhead/sqm			
Spray @ 2ml/litre at tillering(T)	380	5	400	3	390	5
Spray @ 4ml/litre at tillering	378	6	392	6	385	6
Spray @ 2ml/litre at heading (H)	400	3	392	5	396	3
Spray @ 4ml/litre at heading	404	2	397	4	401	2
Spray @ 2ml/litre at T & H	380	4	406	2	393	4
Spray @ 4ml/litre at T & H	406	1	422	1	414	1
MEAN	391		401		396	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	NS		13.49		NS	NS
			Grains/earhead			
Spray @ 2ml/litre at tillering(T)	24.05	4	25.18	6	24.61	6
Spray @ 4ml/litre at tillering	25.11	3	26.11	4	25.61	3
Spray @ 2ml/litre at heading (H)	23.75	6	26.16	3	24.95	5
Spray @ 4ml/litre at heading	24.00	5	26.48	1	25.24	4
Spray @ 2ml/litre at T & H	27.07	1	25.85	5	26.46	1
Spray @ 4ml/litre at T & H	25.78	2	26.22	2	26.00	2
MEAN	24.96		26.00		25.48	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	NS		NS		NS	NS
			1000 Grains Weight, g			
Spray @ 2ml/litre at tillering(T)	42.30	4	41.81	6	42.05	6
Spray @ 4ml/litre at tillering	41.79	6	43.01	3	42.40	5
Spray @ 2ml/litre at heading (H)	42.57	3	42.76	5	42.66	4
Spray @ 4ml/litre at heading	42.75	2	42.93	4	42.84	2
Spray @ 2ml/litre at T & H	42.28	5	43.26	2	42.77	3
Spray @ 4ml/litre at T & H	42.85	1	43.55	1	43.20	1
MEAN	42.42		42.89		42.65	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	NS		0.60		NS	NS
			Biomass, q/ha			
Spray @ 2ml/litre at tillering(T)	86.84	6	96.14	6	91.49	6
Spray @ 4ml/litre at tillering	89.48	5	99.61	4	94.55	5
Spray @ 2ml/litre at heading (H)	90.98	4	98.69	5	94.84	4
Spray @ 4ml/litre at heading	93.71	3	101.67	3	97.69	3
Spray @ 2ml/litre at T & H	98.73	2	103.72	2	101.22	2
Spray @ 4ml/litre at T & H	101.32	1	107.48	1	104.40	1
MEAN	93.51		101.22		97.36	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	5.40		3.82		NS	NS
			Plant height, cm			
Spray @ 2ml/litre at tillering(T)	89.8	5	91.8	6	90.8	6
Spray @ 4ml/litre at tillering	90.7	2	92.6	5	91.7	5
Spray @ 2ml/litre at heading (H)	88.8	6	94.7	3	91.8	4
Spray @ 4ml/litre at heading	90.0	4	94.7	2	92.3	2
Spray @ 2ml/litre at T & H	90.1	3	94.2	4	92.2	3
Spray @ 4ml/litre at T & H	92.6	1	96.1	1	94.4	1
MEAN	90.3		94.0		92.2	
	Seed treatment (A)		Spray (B)		B within A	A within B
CD (0.05)	0.58		1.18		1.67	1.61

Centres: Bajaura and Malan

**Table 6.12. North Western Plains Zone**

	SPL-2		Pooled		2021-22	
	Seed treatment with sea weed extract					
Foliar spray	Without	Rk	With	Rk	Mean	Rk
<b>Yield, q/ha</b>						
Foliar @ 2ml/litre water tillering	50.66	5	50.48	4	50.57	5
Foliar @ 4ml/litre water tillering	51.68	3	50.82	3	51.25	3
Foliar @ 2ml/litre water heading	49.91	6	50.04	5	49.97	6
Foliar @ 4ml/litre water heading	51.37	4	49.81	6	50.59	4
Foliar @ 2ml/litre water tillering & heading	52.93	2	51.34	2	52.13	2
Foliar @ 4ml/litre water tillering & heading	53.32	1	53.05	1	53.18	1
Mean	51.65		50.92		51.28	
	Seed Treat (A)		Foliar spray (B)		B within A	A within B
C.D.(0.05)	0.44		0.84		NS	NS
<b>Earheads/sq.m</b>						
Foliar @ 2ml/litre water tillering	409	5	409	5	409	5
Foliar @ 4ml/litre water tillering	419	3	419	3	419	3
Foliar @ 2ml/litre water heading	406	6	397	6	401	6
Foliar @ 4ml/litre water heading	414	4	409	4	411	4
Foliar @ 2ml/litre water tillering & heading	422	2	423	2	422	2
Foliar @ 4ml/litre water tillering & heading	436	1	431	1	434	1
Mean	417		415		416	
	Seed Treat (A)		Foliar spray (B)		B within A	A within B
C.D.(0.05)	N.S.		8.97		NS	NS
<b>1000 grains weight, g</b>						
Foliar @ 2ml/litre water tillering	37.79	4	37.91	5	37.85	5
Foliar @ 4ml/litre water tillering	37.98	3	38.04	4	38.01	4
Foliar @ 2ml/litre water heading	37.41	6	37.59	6	37.50	6
Foliar @ 4ml/litre water heading	37.79	5	38.36	3	38.07	3
Foliar @ 2ml/litre water tillering & heading	38.80	2	38.89	2	38.84	2
Foliar @ 4ml/litre water tillering & heading	39.46	1	39.65	1	39.55	1
Mean	38.20		38.41		38.30	
	Seed Treat (A)		Foliar spray (B)		B within A	A within B
C.D.(0.05)	N.S.		0.87		NS	NS
<b>Grains per ear head</b>						
Foliar @ 2ml/litre water tillering	33.65	1	33.14	2	33.39	2
Foliar @ 4ml/litre water tillering	33.64	2	32.57	3	33.10	3
Foliar @ 2ml/litre water heading	33.22	4	34.21	1	33.71	1
Foliar @ 4ml/litre water heading	33.26	3	32.48	4	32.87	4
Foliar @ 2ml/litre water tillering & heading	33.08	5	32.05	6	32.56	5
Foliar @ 4ml/litre water tillering & heading	31.61	6	32.16	5	31.89	6
Mean	33.08		32.77		32.92	
	Seed Treat (A)		Foliar spray (B)		B within A	A within B
C.D.(0.05)	N.S.		NS		NS	NS
<b>Biomass, q/ha</b>						
Foliar @ 2ml/litre water tillering	118.01	6	116.59	6	117.30	6
Foliar @ 4ml/litre water tillering	122.65	3	119.02	4	120.84	3
Foliar @ 2ml/litre water heading	119.08	5	116.70	5	117.89	5
Foliar @ 4ml/litre water heading	120.00	4	119.63	3	119.81	4
Foliar @ 2ml/litre water tillering & heading	123.62	2	122.88	2	123.25	2
Foliar @ 4ml/litre water tillering & heading	127.22	1	124.36	1	125.79	1
Mean	121.76		119.86		120.81	
	Seed Treat (A)		Foliar spray (B)		B within A	A within B
C.D.(0.05)	1.36		2.00		NS	NS

**Centres:** Delhi, Gurdaspur and Jammu.



In NEPZ, this experiment was conducted at four locations (Coochbehar, Ranchi Sabour , and Varanasi). The pooled analyzed data of these centres are presented in Table 6.13. The perusal of data revealed that there was non-significant effect of seed treatment and foliar application on the grain yield, earhead / m<sup>2</sup>, grains per earhead and 1000 grains weight. The maximum grain yield (48.66 q/ha) was obtained by foliar application of seaweed extract (CP\*)@ 4ml/litre water at tillering stage. Centre wise data are given in Tables 6.13.1 to 6.13.4 of Annexure-I.

**Table 6.13. North Eastern Plains Zone SPL-2 Pooled 2021-22**

Foliar spray	Seed treatment with sea weed extract				Mean	Rk
	Control	Rk	Seed treatment	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	47.30	4	45.71	6	46.50	6
Seaweed ext 4ml/lit tillering	49.24	1	48.08	3	48.66	1
Seaweed ext 2ml/lit heading	46.30	6	48.81	2	47.55	4
Seaweed ext 4ml/lit heading	48.33	2	46.71	5	47.52	5
Seaweed ext 2ml/lit tillering & heading	47.29	5	49.41	1	48.35	2
Seaweed ext 4ml/lit tillering & heading	47.81	3	47.81	4	47.81	3
Mean	47.71		47.75		47.73	
CD (0.05)	Seed treatment (A) NS		Foliar spray (B) NS		B within A NS	A within B NS
<b>Earhead/sqm</b>						
Seaweed ext 2ml/lit tillering	339	4	344	6	342	5
Seaweed ext 4ml/lit tillering	351	1	353	3	352	2
Seaweed ext 2ml/lit heading	327	6	350	5	338	6
Seaweed ext 4ml/lit heading	338	5	350	4	344	4
Seaweed ext 2ml/lit tillering & heading	345	3	358	2	351	3
Seaweed ext 4ml/lit tillering & heading	349	2	363	1	356	1
Mean	341		353		347	
CD (0.05)	Seed treatment (A) NS		Foliar spray (B) NS		B within A NS	A within B NS
<b>Grains/earhead</b>						
Seaweed ext 2ml/lit tillering	34.84	3	34.13	4	34.48	5
Seaweed ext 4ml/lit tillering	34.74	4	35.17	2	34.96	2
Seaweed ext 2ml/lit heading	35.56	2	36.20	1	35.88	1
Seaweed ext 4ml/lit heading	35.87	1	33.96	5	34.91	3
Seaweed ext 2ml/lit tillering & heading	34.61	6	35.11	3	34.86	4
Seaweed ext 4ml/lit tillering & heading	34.63	5	33.28	6	33.95	6
Mean	35.04		34.64		34.84	
CD (0.05)	Seed treatment (A) NS		Foliar spray (B) NS		B within A NS	A within B NS
<b>1000 grains weight, g</b>						
Seaweed ext 2ml/lit tillering	41.48	6	41.58	1	41.53	3
Seaweed ext 4ml/lit tillering	41.72	3	41.20	5	41.46	5
Seaweed ext 2ml/lit heading	42.02	1	40.82	6	41.42	6
Seaweed ext 4ml/lit heading	41.89	2	41.36	3	41.63	1
Seaweed ext 2ml/lit tillering & heading	41.70	4	41.27	4	41.49	4
Seaweed ext 4ml/lit tillering & heading	41.57	5	41.50	2	41.53	2
Mean	41.73		41.29		41.51	
CD (0.05)	Seed treatment (A) NS		Foliar spray (B) NS		B within A NS	A within B NS

**Centres:** Coochbehar, Ranchi, Sabour, and Varanasi

In CZ, this trial was conducted with an objective to maximize wheat productivity by the use of seaweed extract as seed treatment and foliar application at three locations (Dhanduka, Durgapura and Udaipur). A perusal of pooled data (Table 6.14) revealed that among various sea weed extract treatments there were significant differences in grain yield. Maximum grain yield (52.42 q/ha) was recorded for foliar application of seaweed extract (CP\*)@ 4ml/litre water at tillering & heading treatment along with seed treatment and was followed by foliar application of seaweed extract (CP\*)@ 2ml/litre water at tillering & heading stage (49.91 q/ha). Seed treated with seaweed extract also produce significantly higher mean grain yield (45.91 q/ha) than untreated seed (42.13 q/ha). The centre wise data have been illustrated in Tables 6.14.1 to 6.14.3 of Annexure-I.

<b>Table 6.14. Central Zone</b>		<b>SPL-2 Pooled</b>		<b>2021-22</b>		
Foliar spray	<b>Seed treatment with sea weed extract</b>				Mean	Rk
	Control	Rk	Seed treatment	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	38.39	6	39.46	6	38.92	6
Seaweed ext 4ml/lit tillering	40.00	5	42.44	5	41.22	5
Seaweed ext 2ml/lit heading	40.33	4	43.65	4	41.99	4
Seaweed ext 4ml/lit heading	42.08	3	47.59	3	44.84	3
Seaweed ext 2ml/lit tillering & heading	44.53	2	49.91	2	47.22	2
Seaweed ext 4ml/lit tillering & heading	47.48	1	52.42	1	49.95	1
Mean	42.13		45.91		44.02	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	1.25		1.62		NS	NS
<b>Earhead/sqm</b>						
Seaweed ext 2ml/lit tillering	308	6	316	6	312	6
Seaweed ext 4ml/lit tillering	311	5	321	5	316	5
Seaweed ext 2ml/lit heading	326	4	334	4	330	4
Seaweed ext 4ml/lit heading	332	3	343	3	338	3
Seaweed ext 2ml/lit tillering & heading	340	2	358	2	349	2
Seaweed ext 4ml/lit tillering & heading	344	1	359	1	352	1
Mean	327		339		333	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	NS		NS		NS	NS
<b>Grains/earhead</b>						
Seaweed ext 2ml/lit tillering	31.5	3	30.4	5	31.0	4
Seaweed ext 4ml/lit tillering	31.3	4	30.9	4	31.1	3
Seaweed ext 2ml/lit heading	31.6	2	29.9	6	30.7	6
Seaweed ext 4ml/lit heading	30.4	6	32.9	1	31.7	2
Seaweed ext 2ml/lit tillering & heading	30.4	5	31.4	3	30.9	5
Seaweed ext 4ml/lit tillering & heading	32.6	1	32.3	2	32.5	1
Mean	31.3		31.3		31.3	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	NS		NS		NS	NS
<b>1000 grains weight, g</b>						
Seaweed ext 2ml/lit tillering	39.59	5	40.72	6	40.16	6
Seaweed ext 4ml/lit tillering	41.02	4	42.58	4	41.80	3
Seaweed ext 2ml/lit heading	39.18	6	43.42	3	41.30	5
Seaweed ext 4ml/lit heading	41.46	3	42.00	5	41.73	4
Seaweed ext 2ml/lit tillering & heading	42.67	2	44.58	2	43.62	2
Seaweed ext 4ml/lit tillering & heading	42.77	1	44.89	1	43.83	1
Mean	41.12		43.03		42.07	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	0.82		1.22		NS	NS

**Centres:** Dhanduka, Durgapura, Udaipur

In PZ, the experiment on seaweed extract was conducted at three locations (Akola, Dharwad and Niphad). The perusal of pooled analysis data presented in Table 6.15 showed that seed treatment with seaweed extract made significant increase in grain yield (42.97 q/ha) over untreated control (40.64 q/ha). The maximum mean grain yield was observed with two foliar spray of seaweed extract using 4 ml/lit dose at tillering and heading stages. However, spray of seaweed extract with upper dose (4 ml/lit) either at tillering or heading stage and seaweed extract spray with low dose (2ml/lit) at heading stage produced similar mean grain yield as with spray of seaweed extract @ 4 ml/lit at both stages. The mean wheat yield with seed treatment was 5.73% higher than the practice of untreated seed. The centrewise data are given in Table 6.15.1 to Table 6.15.3 of Annexure-I.

Foliar spray	SPL-2		Pooled		2021-22	
	Seed treatment with seaweed extract				Mean	Rk
	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	38.69	6	40.14	6	39.41	6
Seaweed ext 4ml/lit tillering	40.02	5	44.68	1	42.35	2
Seaweed ext 2ml/lit heading	41.76	1	42.79	5	42.27	3
Seaweed ext 4ml/lit heading	41.29	3	43.04	3	42.16	4
Seaweed ext 2ml/lit tillering & heading	40.54	4	42.95	4	41.74	5
Seaweed ext 4ml/lit tillering & heading	41.58	2	44.22	2	42.90	1
Mean	40.64		42.97		41.81	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	1.2		1.50		N.S.	N.S.
<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	333	3	358	3	345	4
Seaweed ext 4ml/lit tillering	333	4	342	5	337	5
Seaweed ext 2ml/lit heading	342	2	351	4	347	2
Seaweed ext 4ml/lit heading	314	6	338	6	326	6
Seaweed ext 2ml/lit tillering & heading	327	5	366	1	346	3
Seaweed ext 4ml/lit tillering & heading	349	1	358	2	354	1
Mean	333		352		343	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	N.S.		N.S.		N.S.	N.S.
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	32.82	5	31.14	4	31.98	6
Seaweed ext 4ml/lit tillering	33.80	2	34.90	1	34.35	1
Seaweed ext 2ml/lit heading	33.60	3	30.74	6	32.17	5
Seaweed ext 4ml/lit heading	34.20	1	32.13	3	33.17	2
Seaweed ext 2ml/lit tillering & heading	33.56	4	31.11	5	32.33	4
Seaweed ext 4ml/lit tillering & heading	31.58	6	33.93	2	32.75	3
Mean	33.26		32.33		32.79	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	N.S.		N.S.		N.S.	N.S.
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	39.17	4	40.79	4	39.98	5
Seaweed ext 4ml/lit tillering	39.00	6	40.33	6	39.67	6
Seaweed ext 2ml/lit heading	39.03	5	41.12	3	40.07	4
Seaweed ext 4ml/lit heading	40.73	2	42.37	1	41.55	1
Seaweed ext 2ml/lit tillering & heading	39.75	3	41.53	2	40.64	3
Seaweed ext 4ml/lit tillering & heading	41.17	1	40.77	5	40.97	2
Mean	39.81		41.15		40.48	
CD (0.05)	Seed treatment (A)		Foliar spray (B)		B within A	A within B
	0.93		0.81		N.S.	N.S.

**Centres:** Akola, Dharwad, Niphad

### SPL-3: Maximizing wheat productivity through nano urea usage under irrigated condition

This experiment was conducted to explore the possibility of maximizing wheat productivity by integrated use of nano urea. The experiment was laid out in randomised complete block design with thirteen treatments viz. control (No N) and 50, 75 and 100% of Rec N rates along with either one spray of nano urea or two spray of nano urea or two spray of urea. One third nitrogen as per treatment, full phosphorus and potash as basal dose and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation were applied. Irrigation and weed control measures were followed as per recommended package of practices for the concerned zone.

In NHZ, this experiment was conducted at Almora centre only. The data presented in Table 6.16 showed that the lowest grain yield (24.52 q/ha) was recorded in no N application control treatment. In comparison to control, all the treatments caused significant yield improvement. No specific trend with regards to nano urea applications was observed.

Treatments	SPL-3		Almora	2021-22		
	Earheads/ sqm	1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha	Plant height, cm
Rec. N doses (1/3 <sup>rd</sup> basal, 1/3 <sup>rd</sup> CRI, 1/3 <sup>rd</sup> tillering- Rec. N) + water spray at tillering & jointing	335	46.83	36.40	56.75	132.23	95.8
Rec. N + one spray of nano urea at tillering	314	48.52	34.01	51.70	127.23	95.8
Rec. N + two spray of nano urea at tillering & jointing	309	48.16	32.15	48.41	137.04	98.1
Rec. N + two spray of urea (5%) at tillering & jointing	337	49.72	33.45	55.47	139.93	98.8
75% N + water spray at tillering & jointing	288	48.96	28.54	40.06	101.79	90.4
75% N + one spray of nano urea at tillering	312	50.52	28.69	44.96	128.05	95.9
75% N + two spray of nano urea at tillering & jointing	312	48.27	26.87	40.38	105.79	92.3
75% N + two spray of 5% urea at tillering & jointing	315	50.07	27.06	43.62	117.59	95.0
50% N + water spray at tillering & jointing	325	50.00	23.29	38.27	112.27	92.1
50% N + one spray of nano urea at tillering	314	48.71	21.74	33.22	111.80	90.1
50% N + two spray of nano urea at tillering & jointing	332	49.29	16.17	26.19	99.53	88.6
50% N + Two spray of 5% urea at tillering & jointing	309	50.55	22.29	34.75	105.09	90.4
Control (without N only)	257	48.77	19.37	24.52	68.91	75.5
CD(0.05)	37.64	2.34	5.73	8.43	22.17	4.89

In NWPZ, this experiment was conducted at eight locations (Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana and Pantnagar). The perusal of pooled analysis data presented in Table 6.17 showed that application of recommended N (rec. N - 1/3<sup>rd</sup> as basal, 1/3<sup>rd</sup> at CRI and 1/3<sup>rd</sup> at jointing as 150:60:40 kg NPK/ha) and two spray of nano

urea at tillering and jointing stage produced the maximum grain yield of 50.52 q/ha. However, the grain yield with rec. N + two spray of simple urea (5%) at tillering and jointing stage (49.45 q/ha) and with rec. N + one spray of nano urea at tillering (49.26 q/ha) were at par with rec. N + two sprays of nano urea. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization brought an increase of 6.38% in grain yield over rec. N treatment. The yield gain might be due to the bolder grains with thousand grains weight of 38.16 g in nano urea spray against 36.93 g for recommended dose of N fertilizer without any spray. The centrewise data have been given in Table 6.17.1 to Table 6.17.8 of Annexure-I.

Table 6.17. North Western Plains Zone Treatments	Yield, q/ha	SPL-3		Pooled		2021-22
		Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass , q/ha	Plant Ht., cm
Rec. N doses (1/3rd basal, 1/3rd CRI, 1/3rd tillering- Rec. N) + water spray at tillering & jointing	47.49	369	36.93	36.18	124.33	94.60
Rec. N + one spray of nano urea at tillering	49.26	406	37.09	34.49	133.31	101.01
Rec. N + two spray of nano urea at tillering & jointing	50.52	405	38.16	34.43	134.59	101.56
Rec. N + two spray of urea (5%) at tillering & jointing	49.45	406	37.35	34.90	131.82	101.43
75% N + water spray at tillering & jointing	44.76	367	36.71	34.67	125.06	97.12
75% N + one spray of nano urea at tillering	45.46	368	37.32	34.24	127.22	98.05
75% N + two spray of nano urea at tillering & jointing	47.22	378	37.48	34.54	127.00	98.99
75% N + two spray of 5% urea at tillering & jointing	46.59	376	37.58	34.30	129.74	98.51
50% N + water spray at tillering & jointing	41.86	335	37.50	34.34	117.78	92.37
50% N + one spray of nano urea at tillering	42.81	345	36.80	34.69	122.97	94.06
50% N + two spray of nano urea at tillering & jointing	44.62	362	37.05	34.61	120.19	94.98
50% N + Two spray of 5% urea at tillering & jointing	44.38	363	36.85	34.55	122.86	95.92
Control (without N only)	29.47	273	35.86	30.53	86.13	82.52
CD (0.05)	1.26	9.97	0.84	1.45	3.36	2.00

**Centres:** Delhi, Gurdaspur, Gwalior, Hisar, Jammu, Karnal, Ludhiana and Pantnagar

In NEPZ, this experiment was conducted at five locations (Burdwan, Coochbehar, Ranchi, Sabour and Varanasi). The pooled analyzed data of these centres are presented in Table 6.18. The perusal of data revealed that the maximum grain yield (48.23 q/ha) was obtained under recommended N Dose + two sprays of nano urea at tillering & jointing stage treatment, which was at par to recommended N Dose + one spray of nano urea at tillering and recommended N Dose+ two spray of urea (5%) at tillering & jointing and significantly superior to all other treatments . This gain in grain yield was due to more earhead density and bold grains. The yield gain in recommended N Dose + two spray of nano urea at tillering & jointing stage treatment over control was 120%. Centre wise data are given in Tables 6.18.1 to 6.18.5 of Annexure-I.

Table 6.18. North Eastern Plains Zone	SPL-3			Pooled	2021-22
	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha
Treatments					
Rec. N doses (1/3rd basal, 1/3rd CRI, 1/3rd tillering- Rec. N) + water spray at tillering & jointing	44.99	293	41.87	37.87	105.37
Rec. N + one spray of nano urea at tillering	46.19	301	41.90	38.43	101.09
Rec. N + two spray of nano urea at tillering & jointing	48.23	307	42.68	37.84	106.66
Rec. N + two spray of urea (5%) at tillering & jointing	48.08	303	42.13	39.27	110.31
75% N + water spray at tillering & jointing	40.50	276	41.05	36.71	92.54
75% N + one spray of nano urea at tillering	42.12	285	41.87	35.89	96.00
75% N + two spray of nano urea at tillering & jointing	44.08	294	41.19	36.77	99.33
75% N + two spray of 5% urea at tillering & jointing	43.19	272	41.75	39.58	99.11
50% N + water spray at tillering & jointing	35.21	272	40.22	33.44	81.44
50% N + one spray of nano urea at tillering	36.36	262	40.18	35.81	81.63
50% N + two spray of nano urea at tillering & jointing	36.30	278	40.70	32.34	82.46
50% N + Two spray of 5% urea at tillering & jointing	36.62	260	41.31	34.91	85.77
Control (without N only)	21.91	227	37.57	26.13	53.77
CD (0.05)	2.50	16	1.60	3.00	5.58

**Centres:** Burdwan, Coochbehar, Ranchi, Sabour and Varanasi

In CZ, this trial was conducted at seven locations (Bilaspur, Durgapura, Jabalpur, Junagadh, Powarkheda, Indore, Vijapur). The pooled analysis of data of seven centres presented in Table 6.19 revealed that maximum grain yield (54.02 q/ha) was produced under treatment of rec. N+ two spray of nano urea at tillering and jointing, followed by rec. N+ two spray of urea (5%) at tillering and jointing (53.13 q/ha) and rec. N+ one spray of nano urea at tillering (52.34 q/ha). All three treatments were statistically at par but significantly better than other treatments. The centre wise data have been illustrated in Tables 6.19.1 to 6.19.7 of Annexure-I.

Table 6.19. Central Zone	SPL 3			Pooled	2021-22	
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
Treatments						
Rec. N doses (1/3rd basal, 1/3rd CRI, 1/3rd tillering- Rec. N) + water spray at tillering & jointing	394	29.0	45.28	50.71	87.9	105.40
Rec. N + one spray of nano urea at tillering	402	28.8	46.14	52.34	89.3	107.87
Rec. N + two spray of nano urea at tillering & jointing	407	29.5	46.58	54.02	91.7	110.16
Rec. N + two spray of urea (5%) at tillering & jointing	401	29.2	46.41	53.13	90.8	104.99
75% N + water spray at tillering & jointing	382	28.5	44.58	47.32	85.1	103.32
75% N + one spray of nano urea at tillering	373	29.2	45.38	48.74	85.9	104.76
75% N + two spray of nano urea at tillering & jointing	388	28.8	45.80	49.83	87.5	104.71
75% N + two spray of 5% urea at tillering & jointing	383	29.1	45.90	50.22	88.0	101.82
50% N + water spray at tillering & jointing	341	28.6	43.30	41.48	80.4	92.16
50% N + one spray of nano urea at tillering	341	30.0	43.61	43.65	82.4	96.35
50% N + two spray of nano urea at tillering & jointing	348	29.3	44.59	44.47	83.4	95.45
50% N + Two spray of 5% urea at tillering & jointing	354	29.7	44.17	45.59	83.4	96.61
Control (without N only)	298	23.1	42.87	28.07	73.8	72.33
CD (0.05)	12.32	1.21	0.93	1.62	1.79	3.50

**Centres:** Bilaspur, Durgapura, Indore, Jabalpur, Junagadh, Powarkheda, Vijapur

In PZ, this experiment was conducted at four locations (Akola, Dharwad, Niphad and Pune). The perusal of pooled analysis data presented in Table 6.20 showed that application of recommended N and two spray of nano urea at tillering and jointing stage produced the maximum grain yield of 48.78 q/ha. However, the grain yield with two spray of urea (5%) at tillering and jointing stage was at par to two spray of nano urea. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization brought an increase of 8.14% in grain yield over base treatment. The treatment of 75% N + two spray of urea (5%) produced the bolder grains with thousands grains weight of 43.55 g against 41.22 g for recommended dose of N fertilizer without any spray. The centrewise data are given in Table 6.20.1 to Table 6.20.4 of Annexure-I.

<b>Table 6.20. Peninsular Zone</b>	<b>SPL-3</b>		<b>Pooled</b>		<b>2021-22</b>
Nano urea application	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Plant height, cm
Rec. N doses (1/3 <sup>rd</sup> basal, 1/3 <sup>rd</sup> CRI, 1/3 <sup>rd</sup> tillering- Rec. N) + water spray at tillering & jointing	336	41.22	32.35	45.11	82.03
Rec. N + one spray of nano urea at tillering	346	43.02	30.26	45.11	83.81
Rec. N + two spray of nano urea at tillering & jointing	378	42.52	30.87	48.78	82.47
Rec. N + two spray of urea (5%) at tillering & jointing	344	43.09	32.25	47.41	80.08
75% N + water spray at tillering & jointing	332	42.61	29.42	41.93	80.76
75% N + one spray of nano urea at tillering	353	41.29	30.65	44.78	79.19
75% N + two spray of nano urea at tillering & jointing	352	41.77	31.64	46.01	81.43
75% N + two spray of 5% urea at tillering & jointing	355	43.55	29.83	45.86	80.81
50% N + water spray at tillering & jointing	302	42.66	30.23	39.11	80.14
50% N + one spray of nano urea at tillering	300	42.24	32.09	40.33	80.42
50% N + two spray of nano urea at tillering & jointing	328	42.92	30.92	43.18	83.13
50% N + Two spray of 5% urea at tillering & jointing	324	42.04	31.05	42.17	80.15
Control (without N only)	282	41.67	26.37	31.08	76.29
CD (0.05)	24.18	1.43	3.06	2.97	3.42

**Centres:** Akola, Dharwad, Niphad, Pune

#### **SPL- 4: Effect of nano urea under restricted irrigation conditions**

In NHZ, this trial was conducted at one location namely Bajaura. The data presented in Table 6.21 clearly reveal that significantly highest wheat grain yield (54.24 q/ha) was obtained by applying recommended dose of N along with spray of urea (5%) + nano urea at tillering stage. The minimum grain yield (20.45 q/ha) was recorded in absolute control (No nitrogen). Compared to control treatment, application of two spray of nano urea alone at tillering and jointing significantly increased the grain yield (26.18 q/ha). Also, compared to recommended N, one or two spray of either nano urea or urea significantly improved the grain yield. In comparison to control, combination of Rec. N with either nano urea or urea resulted in significant improvement in earhead density, 1000 grains weight, grains per earhead, biomass and plant height.

Table 6.21. Northern Hill Zone	SPL-4		Bajaura	2021-22		
	Earheads/ m <sup>2</sup>	1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha	Plant ht., cm
Treatments						
One Nano Urea Spray at tillering	329	38.37	18.67	23.45	67.08	85.7
Two Nano Urea Spray at tillering & Jointing	336	40.77	19.11	26.18	74.31	88.1
Rec N (1/3rd basal, 2/3rd CRI)	391	46.17	26.72	48.11	112.18	93.2
Rec N + One Nano Urea Spray at tillering	394	45.97	29.20	52.92	119.06	92.0
Rec N + Two Nano Urea Spray at tillering & Jointing	383	47.75	29.61	54.06	119.27	92.9
Rec N + One Urea (5%) Spray at tillering	391	47.76	28.29	52.82	115.66	94.0
Rec N + Two Urea (5%) Spray at tillering & Jointing	381	48.47	28.93	53.41	115.82	93.4
Rec N + One Urea (5%) + Nano Urea spray at tillering	378	48.23	29.82	54.24	117.31	95.7
Absolute control (No Nitrogen)	323	36.93	17.14	20.45	62.87	84.1
CD (0.05)	23.58	2.24	1.87	3.57	9.19	3.59

In NWPZ, this experiment was conducted at four locations (Gwalior, Hisar, Karnal and Pantnagar). The perusal of pooled analysis data presented in Table 6.22 showed that application of recommended N {Rec N (1/3<sup>rd</sup> basal, 2/3<sup>rd</sup> CRI)} and two spray of nano urea at tillering and jointing stage produced the maximum grain yield of 47.70 q/ha followed by recommended N and one spray of 5% urea + one spray of nano urea at tillering stage (47.11 q/ha) which was at par with former. The addition of two spray of nano urea at tillering and jointing stage with recommended N fertilization brought an increase of 4.9% in grain yield over recommended N treatment. The centrewise data are given in Table 6.22.1 to Table 6.22.4 of Annexure-I.

Table 6.22. North Western Plains Zone	SPL-4		Pooled	2021-22		
	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass , q/ha	Plant Ht., cm
Treatments						
One Nano Urea Spray at tillering	39.55	351	36.90	31.66	114.42	98.28
Two Nano Urea Spray tillering & Jointing	40.63	343	36.17	33.13	115.39	99.04
Rec N (1/3rd basal, 2/3rd CRI-Rec N)	45.48	374	37.63	32.84	123.88	101.03
Rec N + One Nano Urea Spray tillering	47.01	364	36.54	35.80	125.15	102.05
Rec N + Two Nano Urea Spray tillering & Jointing	47.70	406	36.73	32.58	126.00	102.46
Rec N + One Urea (5%) Spray tillering	44.16	375	35.21	34.12	124.80	101.09
Rec N + Two Urea (5%) Spray tillering & Jointing	45.23	399	36.14	32.50	126.48	101.77
Rec N + One Urea (5%) Spray+ Nano Urea tillering	47.11	392	36.54	33.40	126.27	102.55
Absolute Control	33.87	317	35.67	31.24	101.21	95.28
CD (0.05)	1.82	24.87	1.44	2.80	6.17	2.27

**Centres:** Gwalior, Hisar, Karnal and Pantnagar

In NEPZ, this experiment was conducted at five locations (Ayodhya, Burdwan, Kanpur, RPCAU PUSA and Shillongani). Burdwan centre was excluded due to very low yield. The pooled analyzed data of these centres are presented in Table 6.23. The perusal of data revealed that the maximum grain yield (45.8 q/ha) was obtained under recommended N +



one spray of urea (5%) + nano urea at tillering (40-45 DAS), which was at par to recommended N + two sprays of urea (5%) at tillering (40-45) and Jointing (60-65 DAS) and was significantly superior to all other treatments . This gain in grain yield was due to more earhead density and bold grains. The yield gain in recommended N + one spray of urea (5%) + nano urea at tillering (40-45 DAS) treatment over control was 94.06%. Centre wise data are given in Tables 6.23.1 to 6.23.5 of Annexure-I.

**Table 6.23. North Eastern Plains Zone**

Treatments	SPL-4 Pooled				2021-22	
	Earheads/ sqm	Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Biomass, q/ha	Plant ht., cm
One Nano Urea Spray at tillering	271	34.6	39.7	28.9	66.3	83.9
Two Nano Urea Spray tillering & Jointing	282	36.7	40.0	32.6	79.0	87.0
Rec N (1/3rd basal, 2/3rd CRI-Rec N)	327	31.4	39.7	37.6	92.0	95.5
Rec N + One Nano Urea Spray tillering	325	33.7	40.5	40.2	95.5	94.9
Rec N + Two Nano Urea Spray tillering & Jointing	344	33.6	39.4	42.0	95.3	96.7
Rec N + One Urea (5%) Spray tillering	338	34.9	40.6	42.9	99.6	98.5
Rec N + Two Urea (5%) Spray tillering & Jointing	338	34.7	42.5	44.7	106.5	98.7
Rec N + One Urea (5%) Spray+ Nano Urea tillering	342	35.6	41.1	45.8	106.9	98.7
Absolute Control	245	31.8	36.7	23.6	63.2	78.2
CD ( 0.05)	7	3.0	0.9	1.3	2.2	6.0

**Centres:** Ayodhya, Kanpur, RPCAU PUSA and Shillongani

In CZ, this trial at three locations (Indore, Udaipur, Vijapur). The experiment was conducted with nine N treatment combinations with two irrigations in three replications. The pooled analysis of data of three centres presented in Table 6.24 revealed that maximum grain yield (46.08q/ha) was produced in treatment of rec. N + two spray of nano urea at tillering and jointing followed by rec N + two spray of urea (5%) at tillering and jointing (44.40 q/ha) and both treatments remained statistically at par but former one significantly higher than other treatments. The centre wise data have been illustrated in Tables 6.24.1 to 6.24.3 of Annexure-I.

**Table 6.24. Central Zone**

Treatments	SPL-4			Pooled		2021-22
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
One Nano Urea Spray at tillering	284	21.9	43.25	25.31	82.1	76.27
Two Nano Urea Spray tillering & Jointing	289	22.5	43.69	27.25	82.8	96.86
Rec N (1/3rd basal, 2/3rd CRI-Rec N)	345	27.6	44.83	41.37	90.2	111.96
Rec N + One Nano Urea Spray tillering	342	27.7	46.06	42.72	90.0	119.94
Rec N + Two Nano Urea Spray tillering & Jointing	359	28.4	47.00	46.08	91.3	125.85
Rec N + One Urea (5%) Spray tillering	363	26.5	46.30	43.61	91.4	121.65
Rec N + Two Urea (5%) Spray tillering & Jointing	366	27.4	45.48	44.40	91.2	124.58
Rec N + One Urea (5%) Spray+ Nano Urea tillering	348	28.2	46.45	43.51	91.1	100.99
Absolute Control	277	20.3	43.57	22.87	78.3	73.14
CD (0.05)	19.2	1.94	1.59	2.34	1.85	7.62

**Centres:** Indore, Udaipur, Vijapur

### **SPL-5: Lodging management for enhancing yield of *dicoccum* wheat using plant growth regulators**

In CZ, this trial was conducted with an objective to reduce lodging and to enhance the yield potential of improved dicoccum wheat by using growth regulators at Durgapura centre. This trial was conducted with three genotypes i.e. MACS 2971, DDK 1029, and HW 1098 in main plots and five growth regulator combinations in sub plots and replicated thrice. The data presented in Table 6.25 revealed that all three genotypes produced statistically at par yield, though the genotype MACS 2971 proved numerically superior with 43.78 q/ha grain yield. Among plant growth regulator treatments, CCC (2 chloroethyl- trimethyl ammonium chloride) @ 1500 ppm was ranked first with 45.27 q/ha yield and it was statistically at par with CCC (2 chloroethyl- trimethyl ammonium chloride) @ 1000 ppm (43.49 q/ha) but significantly higher as compared to all other treatments.

In PZ, this experiment was conducted at three locations (Dharwad, Niphad and Pune). The perusal of pooled analysis data presented in Table 6.26 revealed that application of CCC (2 chloroethyl- trimethyl ammonium chloride) @1500 ppm produced the maximum mean grain yield of 47.03 q/ha. The application of ethephon either with 10 or 30 ppm also produced statistically similar grain yield. The effect of variety and growth regulator on grain yield was found to be significant. The maximum mean grain yield was found to be 47.62 q/ha for MACS 2971 followed by 46.18 and 42.69 q/ha for DDK 1029 and HW 1098, respectively. The application of all plant growth regulators resulted into bolder grains and lesser plant height over control condition. The centrewise data are given in Tables 6.26.1–6.26.3 of Annexure-I.

### **SPL-6: Resource conservation techniques for enhancing the productivity and resource-use efficiency of soybean-wheat cropping system**

In PZ, this experiment was conducted at three locations (Dharwad, Niphad and Pune). The experiment was conducted in split-plot design having tillage and crop establishment (Conventional tillage-flat bed, zero tillage-flat bed, conventional tillage-broad bed and zero tillage-broad bed) as main plots and residue managements (Control, wheat residue 3t/ha, soybean residue @3t/ha and soybean + wheat residue @3t/ha) in sub-plots. Nutrient application consisted of 120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation. The perusal of pooled analysis data presented in Table 6.27 revealed that grain yield was maximum under conventionally tilled broad bed method; however, effect of tillage method on grain yield was not significant. The use of soybean residue either alone or in combination with wheat residue produced higher grain yield over control. The combined application of soybean and wheat residue with 3 t/ha each

resulted into 10.53 and 5.5%% higher grain yield than treatments of control and wheat residue application (3t/ha), respectively. The increase in grain yield with soybean and wheat residue application was associated with bolder grains with more weight of thousand grains. The centrewise data are given in Tables 6.27.1–6.27.3 of Annexure-I.

Growth regulator	SPL-5		Durgapura		2021-22			
	MACS 2971	Rk	DDK 1029	Rk	HW 1098	Rk	Mean	Rk
	Variety		Variety					
	Yield, q/ha		Yield, q/ha					
Control	39.08	5	34.41	5	37.82	5	37.10	5
CCC @ 1000 ppm	45.99	2	40.03	2	44.45	2	43.49	2
CCC @ 1500 ppm	46.94	1	43.51	1	45.37	1	45.27	1
Ethephon @10 ppm	42.58	4	36.22	4	39.42	4	39.41	4
Ethephon @30 ppm	44.32	3	37.36	3	42.01	3	41.23	3
Mean	43.78		38.31		41.81		41.30	
CD (0.05)	Variety (A)		Growth regulator (B)		B within A		A within B	
	N.S.		1.92		N.S.		N.S.	
	Earheads/sqm		Earheads/sqm					
Control	304	5	280	5	283	5	289	5
CCC @ 1000 ppm	369	2	339	2	357	2	355	2
CCC @ 1500 ppm	371	1	356	1	360	1	362	1
Ethephon @10 ppm	335	4	293	4	312	4	314	4
Ethephon @30 ppm	354	3	305	3	337	3	332	3
Mean	347		315		330		330	
CD (0.05)	Variety (A)		Growth regulator (B)		B within A		A within B	
	N.S.		14.78		N.S.		N.S.	
	Grains/Earhead		Grains/Earhead					
Control	29.9	4	27.4	4	34.1	1	30.5	3
CCC @ 1000 ppm	30.0	3	27.1	5	32.3	4	29.8	5
CCC @ 1500 ppm	30.6	2	29.8	3	32.4	3	30.9	1
Ethephon @10 ppm	30.8	1	30.2	2	31.3	5	30.8	2
Ethephon @30 ppm	27.2	5	30.5	1	32.6	2	30.1	4
Mean	29.7		29.0		32.6		30.4	
CD (0.05)	Variety (A)		Growth regulator (B)		B within A		A within B	
	1.53		N.S.		N.S.		N.S.	
	1000 Grains Weight, g		1000 Grains Weight, g					
Control	43.23	2	45.07	1	39.30	2	42.53	1
CCC @ 1000 ppm	41.67	3	43.83	2	38.63	4	41.38	3
CCC @ 1500 ppm	41.43	4	41.33	3	39.00	3	40.59	5
Ethephon @10 ppm	41.27	5	40.93	4	40.29	1	40.83	4
Ethephon @30 ppm	46.03	1	40.63	5	38.34	5	41.67	2
Mean	42.73		42.36		39.11		41.40	
CD (0.05)	Variety (A)		Growth regulator (B)		B within A		A within B	
	1.72		N.S.		N.S.		N.S.	
	Biomass, q/ha		Biomass, q/ha					
Control	89.12	5	77.52	5	87.10	5	84.58	5
CCC @ 1000 ppm	101.20	3	94.27	2	103.67	2	99.71	2
CCC @ 1500 ppm	105.33	1	101.30	1	105.56	1	104.07	1
Ethephon @10 ppm	89.68	4	86.47	4	92.06	4	89.40	4
Ethephon @30 ppm	101.40	2	87.05	3	99.30	3	95.92	3
Mean	97.35		89.32		97.54		94.74	
CD (0.05)	Variety (A)		Growth regulator (B)		B within A		A within B	
	N.S.		8.90		N.S.		N.S.	

<b>Table 6.26. Peninsular Zone</b>		<b>SPL-5</b>		<b>Pooled</b>		<b>2021-22</b>		
Growth regulator	Variety				Mean	Rk		
	MACS 2971	Rk	DDK 1029	Rk				
<b>Yield, q/ha</b>								
Control	43.95	5	42.73	5	40.31	5	42.33	5
CCC @ 1000 ppm	46.92	4	46.39	4	41.16	4	44.82	4
CCC @ 1500 ppm	49.12	2	47.51	2	44.44	2	47.03	1
Ethephon @10 ppm	49.56	1	47.53	1	42.49	3	46.53	3
Ethephon @30 ppm	48.56	3	46.73	3	45.08	1	46.79	2
Mean	47.62		46.18		42.69		45.50	
CD (0.05)	Variety (A) 1.39		Growth regulator (B) 2.05		B within A N.S.		A within B N.S.	
<b>Earheads/sqm</b>								
Control	371	4	361	5	357	4	363	4
CCC @ 1000 ppm	367	5	367	4	341	5	359	5
CCC @ 1500 ppm	382	3	382	1	361	3	375	3
Ethephon @10 ppm	388	1	373	2	379	2	380	2
Ethephon @30 ppm	386	2	369	3	386	1	380	1
Mean	379		370		365		371	
CD (0.05)	Variety (A) N.S.		Growth regulator (B) 13.81		B within A N.S.		A within B N.S.	
<b>Grains/Earhead</b>								
Control	28.47	5	27.26	5	27.28	3	27.67	5
CCC @ 1000 ppm	29.35	3	28.87	4	27.88	2	28.70	2
CCC @ 1500 ppm	29.94	1	29.17	2	29.17	1	29.43	1
Ethephon @10 ppm	29.43	2	29.14	3	26.67	4	28.41	3
Ethephon @30 ppm	29.17	4	29.39	1	26.58	5	28.38	4
Mean	29.27		28.77		27.51		28.52	
CD (0.05)	Variety (A) N.S.		Growth regulator (B) N.S.		B within A N.S.		A within B N.S.	
<b>1000 Grains Weight, g</b>								
Control	42.22	5	43.61	4	42.14	5	42.66	5
CCC @ 1000 ppm	44.04	2	44.54	1	44.28	2	44.29	1
CCC @ 1500 ppm	43.36	4	43.23	5	43.20	3	43.26	4
Ethephon @10 ppm	43.69	3	44.00	3	42.53	4	43.41	3
Ethephon @30 ppm	44.15	1	44.17	2	44.41	1	44.24	2
Mean	43.49		43.91		43.31		43.57	
CD (0.05)	Variety (A) N.S.		Growth regulator (B) 0.96		B within A N.S.		A within B N.S.	
<b>Plant height, cm</b>								
Control	87.67	1	83.47	1	79.63	1	83.59	1
CCC @ 1000 ppm	81.60	4	77.34	3	73.23	5	77.39	4
CCC @ 1500 ppm	80.83	5	76.31	5	73.81	3	76.99	5
Ethephon @10 ppm	82.03	2	77.61	2	73.69	4	77.78	3
Ethephon @30 ppm	81.73	3	76.40	4	75.74	2	77.96	2
Mean	82.77		78.23		75.22		78.74	
CD (0.05)	Variety (A) 1.57		Growth regulator (B) 1.88		B within A N.S.		A within B N.S.	
<b>Biomass, q/ha</b>								
Control	85.65	5	77.77	5	80.28	5	81.23	5
CCC @ 1000 ppm	87.12	4	83.05	4	81.74	4	83.97	4
CCC @ 1500 ppm	90.41	2	85.15	2	85.46	1	87.01	1
Ethephon @10 ppm	88.90	3	86.67	1	84.23	2	86.60	2
Ethephon @30 ppm	90.76	1	84.25	3	83.99	3	86.34	3
Mean	88.57		83.38		83.14		85.03	
CD (0.05)	Variety (A) 2.45		Growth regulator (B) 2.82		B within A N.S.		A within B N.S.	

**Centres:** Dharwad, Niphad, Pune

Residue management	SPL-6		Pooled		Mean
	CT-Flat bed	ZT-Flat bed	CT-Broad bed	ZT-Broad bed	
<b>Yield, q/ha</b>					
Control	49.87	52.65	49.77	51.00	50.82
Wheat residue @3 t/ha	51.33	52.73	56.76	52.14	53.24
Soybean residue @3 t/ha	55.08	53.45	57.98	54.69	55.30
Soybean + wheat residue @3 t/ha	56.44	53.80	58.99	55.45	56.17
Mean	53.18	53.16	55.88	53.32	53.88
CD (0.05)	Tillage (A) N.S.	Residue Management (B) 1.84	B within A N.S.	A within B N.S.	
<b>Earheads/sqm</b>					
Control	330.44	338.89	355.00	357.67	345.50
Wheat residue @3 t/ha	347.56	356.78	355.89	356.33	354.14
Soybean residue @3 t/ha	349.78	350.56	352.33	370.11	355.69
Soybean + wheat residue @3 t/ha	368.44	360.44	351.67	367.89	362.11
Mean	349.06	351.67	353.72	363.00	354.36
CD (0.05)	Tillage (A) N.S.	Residue Management (B) N.S.	B within A N.S.	A within B N.S.	
<b>Grains/Earhead</b>					
Control	37.67	38.55	34.53	34.08	36.21
Wheat residue @3 t/ha	36.67	35.26	37.54	36.39	36.47
Soybean residue @3 t/ha	39.68	37.82	39.91	35.38	38.20
Soybean + wheat residue @3 t/ha	35.91	36.79	40.58	37.17	37.61
Mean	37.49	37.11	38.14	35.76	37.12
CD (0.05)	Tillage (A) N.S.	Residue Management (B) N.S.	B within A N.S.	A within B N.S.	
<b>1000 Grains Weight, g</b>					
Control	40.94	41.07	39.70	39.93	40.41
Wheat residue @3 t/ha	40.72	42.57	42.30	40.03	41.41
Soybean residue @3 t/ha	40.60	40.86	41.77	40.63	40.97
Soybean + wheat residue @3 t/ha	42.93	42.15	42.71	40.52	42.08
Mean	41.30	41.66	41.62	40.28	41.22
CD (0.05)	Tillage (A) N.S.	Residue Management (B) 0.77	B within A N.S.	A within B N.S.	
<b>Plant Height, cm</b>					
Control	77.24	76.49	75.50	74.80	76.01
Wheat residue @3 t/ha	82.53	83.91	81.91	81.52	82.47
Soybean residue @3 t/ha	83.23	82.11	81.20	79.62	81.54
Soybean + wheat residue @3 t/ha	83.08	83.23	81.54	82.46	82.58
Mean	81.52	81.44	80.04	79.60	80.65
CD (0.05)	Tillage (A) N.S.	Residue Management (B) 1.34	B within A N.S.	A within B N.S.	
<b>Biomass, q/ha</b>					
Control	100.15	104.12	98.02	97.60	99.97
Wheat residue @3 t/ha	101.59	106.20	103.76	102.45	103.50
Soybean residue @3 t/ha	106.15	105.21	101.06	100.54	103.24
Soybean + wheat residue @3 t/ha	107.48	105.19	105.25	100.35	104.57
Mean	103.84	105.18	102.02	100.24	102.82
CD (0.05)	Tillage (A) N.S.	Residue Management (B) N.S.	B within A N.S.	A within B N.S.	

**Centres:** Dharwad, Niphad, Pune

### **SPL-7: Precision nutrient management for higher yield in wheat through fertigation**

In PZ, this experiment was conducted at Dharwad centre. The experiment was conducted in split-plot design having drip irrigation system (surface drip irrigation and subsurface drip irrigation) as main plots and nutrient managements in sub-plots. Nutrient application consisted of 120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen as 1/3<sup>rd</sup> at first irrigation and 1/3<sup>rd</sup> at second irrigation. The data of Dharwad centre presented in Table 6.28 revealed that effect of drip irrigation on grain yield was not significant. Among nutrient management options in sub-plots, the treatment of 100% NPK through water soluble fertilizer at fortnight interval produced the maximum grain yield of 42.69 q/ha as compared to 36.23 q/ha under control treatment (surface irrigation with 100% RDF). The grain yield with treatment having 1/3<sup>rd</sup> NP basal + 2/3<sup>rd</sup> NP weekly interval (8 splits) through drip irrigation was also statistically at par. The maximum grain yield with water soluble fertilizer application was in response to increased earheads, more thousand grains weight and higher biomass production over other treatments.

### **SPL-8: Improving wheat yield through foliar K application**

In NWPZ, the experiment on foliar K application was conducted at one location at Jammu only. The experiment was conducted in split-plot design having irrigation levels (one, two and three) in main plots and foliar K application (control, 2% K application at tillering & jointing and 4% K application at tillering & jointing) in sub-plots. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen was applied during first and second irrigation equally. The perusal of data presented in Table 6.29 showed that number of irrigations brought significant effect on grain yield, earheads, grains/earhead and biomass. The maximum mean grain yield of 38.53 q/ha was observed with three irrigations, which was 40.26 and 6.82% higher than mean grain yield under one and two irrigation condition, respectively. Among treatments in sub-plots, the mean grain yield (34.78 q/ha) was the maximum with 4% K application and numerically better than 34.14 and 33.14 q/ha under 2% K application and control, respectively. The increase in grain yield with foliar K application was in response to more earheads and elevated thousand grains weight over control treatment.

In NEPZ, this experiment was conducted at two locations (Kanpur and Shillongani). The pooled analyzed data of these centres are presented in Table 6.30. The perusal of data revealed that there was significant effects of irrigation levels and foliar application of K on the grain yield. Significantly higher grain yield (45.58 q/ha) was achieved by application of irrigation at crown root initiation and flowering stage over single irrigation at CRI stage. Foliar

Nutrient management	SPL-7		Dharwad		2021-22	
	Drip Irrigation				Mean	Rk
	Surface drip	Rk	Subsurface drip	Rk		
<b>Yield, q/ha</b>						
1/3 <sup>rd</sup> NK basal + 1/3 <sup>rd</sup> NK 20-25 DAS + 1/3 <sup>rd</sup> of NK 40-45 DAS through soil application	37.57	5	36.20	7	36.89	6
1/3 <sup>rd</sup> NK basal + 1/3 <sup>rd</sup> NK 20-25 DAS + 1/3 <sup>rd</sup> of NK 40-45 DAS through drip irrigation	37.45	6	38.35	5	37.90	5
1/3 <sup>rd</sup> NK basal + 2/3 <sup>rd</sup> NK at fortnight interval upto 60 DAS (4 splits) through drip irrigation	39.33	3	41.53	3	40.43	3
1/3 <sup>rd</sup> NK basal + 2/3 <sup>rd</sup> NK weekly interval (8 splits) through drip irrigation	40.69	2	42.20	2	41.44	2
30% NK basal + 30% NK 20 DAS + 20% NK 40 DAS + 20% NP 60 DAS through drip irrigation	39.14	4	40.14	4	39.64	4
100% NPK through water soluble fertilizer at fortnight interval	41.73	1	43.64	1	42.69	1
Mean	39.32		40.34		39.83	
Control	36.23		36.23		36.23	
CD (0.05)	Drip irrigation (A) N.S.		Nutrient management (B) 3.23		B within A N.S.	A within B N.S.
<b>Earheads/sqm</b>						
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through soil application	272	5	268	6	270	6
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through drip irrigation	278	3	273	5	276	4
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP at fortnight interval upto 60 DAS (4 splits) through drip irrigation	267	6	282	3	275	5
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP weekly interval (8 splits) through drip irrigation	285	2	288	2	287	2
30% NP basal + 30% NP 20 DAS + 20% NP 40 DAS + 20% NP 60 DAS through drip irrigation	275	4	277	4	276	3
100% NPK through water soluble fertilizer at fortnight interval	296	1	298	1	297	1
Mean	279		281		280	
Control	256		256		256	
CD (0.05)	Drip irrigation (A) N.S.		Nutrient management (B) 5.82		B within A N.S.	A within B N.S.
<b>Grains/Earhead</b>						
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through soil application	36.14	2	34.50	7	35.32	6
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through drip irrigation	33.86	7	35.16	6	34.51	7
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP at fortnight interval upto 60 DAS (4 splits) through drip irrigation	36.85	1	36.47	2	36.66	1
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP weekly interval (8 splits) through drip irrigation	35.20	4	35.99	4	35.59	4
30% NP basal + 30% NP 20 DAS + 20% NP 40 DAS + 20% NP 60 DAS through drip irrigation	35.35	3	36.31	3	35.83	3
100% NPK through water soluble fertilizer at fortnight interval	34.96	6	35.69	5	35.32	5
Mean	35.39		35.69		35.54	
Control	35.35		36.03		35.69	
CD (0.05)	Drip irrigation (A) N.S.		Nutrient management (B) N.S.		B within A N.S.	A within B N.S.

<b>1000 Grains Weight, g</b>						
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through soil application	38.78	6	39.60	6	39.19	6
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through drip irrigation	39.81	5	39.86	5	39.83	5
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP at fortnight interval upto 60 DAS (4 splits) through drip irrigation	40.19	3	40.40	3	40.30	3
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP weekly interval (8 splits) through drip irrigation	40.85	2	40.83	2	40.84	2
30% NP basal + 30% NP 20 DAS + 20% NP 40 DAS + 20% NP 60 DAS through drip irrigation	40.17	4	39.94	4	40.06	4
100% NPK through water soluble fertilizer at fortnight interval	40.93	1	41.15	1	41.04	1
Mean	40.12		40.30		40.21	
Control	37.22		37.22		37.22	
		Drip irrigation (A)		Nutrient management (B)	B within A	A within B
CD (0.05)		N.S.		N.S.	N.S.	N.S.
<b>Lodging Score</b>						
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through soil application	2.20	1	2.87	2	2.53	2
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through drip irrigation	1.67	5	2.70	3	2.18	3
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP at fortnight interval upto 60 DAS (4 splits) through drip irrigation	2.07	4	1.87	5	1.97	4
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP weekly interval (8 splits) through drip irrigation	2.17	2	1.50	6	1.83	6
30% NP basal + 30% NP 20 DAS + 20% NP 40 DAS + 20% NP 60 DAS through drip irrigation	1.53	6	2.27	4	1.90	5
100% NPK through water soluble fertilizer at fortnight interval	2.17	3	3.17	1	2.67	1
Mean	1.97		2.39		2.18	
Control	0.00		0.00		0.00	
		Drip irrigation (A)		Nutrient management (B)	B within A	A within B
CD (0.05)		N.S.		0.71	N.S.	N.S.
<b>Biomass, q/ha</b>						
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through soil application	58.58	6	56.85	6	57.72	6
1/3 <sup>rd</sup> NP basal + 1/3 <sup>rd</sup> NP 20-25 DAS + 1/3 <sup>rd</sup> of NP 40-45 DAS through drip irrigation	62.17	5	59.92	5	61.04	5
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP at fortnight interval upto 60 DAS (4 splits) through drip irrigation	65.67	3	70.66	3	68.17	3
1/3 <sup>rd</sup> NP basal + 2/3 <sup>rd</sup> NP weekly interval (8 splits) through drip irrigation	67.33	2	70.92	2	69.13	2
30% NP basal + 30% NP 20 DAS + 20% NP 40 DAS + 20% NP 60 DAS through drip irrigation	62.25	4	60.25	4	61.25	4
100% NPK through water soluble fertilizer at fortnight interval	75.25	1	73.00	1	74.13	1
Mean	65.21		65.27		65.24	
Control	55.46		55.46		55.46	
		Drip irrigation (A)		Nutrient management (B)	B within A	A within B
CD (0.05)		N.S.		N.S.	N.S.	N.S.
Date of Sowing:	14.11.2021		Date of Harvesting:			



application of 4% K resulted in significantly higher yield (45.90 q/ha) over spraying of water only although it was at par to foliar application of 2 % K. Similar trend was also observed in earhead density. There was non-significant effect on 1000 grain weight due to irrigation levels and foliar application of K. Centre wise data are given in Tables 6.30.1 to 6.30.2 of Annexure-I.

<b>Table 6.29. North Western Plains Zone</b>		<b>SPL-8</b>		<b>Jammu</b>		<b>2021-22</b>	
Foliar applications of potash		Irrigation				Mean	Rk
	One	Rk	Two	Rk	Three	Rk	
<b>Yield, q/ha</b>							
Control (Water spray)	26.43	3	34.93	3	38.07	3	33.14 3
2% K application at tillering & Jointing stage	27.77	2	36.00	2	38.67	2	34.14 2
4% K application at tillering & Jointing stage	28.20	1	37.27	1	38.87	1	34.78 1
Mean	27.47		36.07		38.53		34.02
CD (0.05)	Irrigation (A) 1.81		Foliar K (B) N.S.		B within A N.S.		A within B N.S.
<b>Earhead/sq.m.</b>							
Control (Water spray)	339	3	355	3	401	3	365 3
2% K application at tillering & Jointing stage	358	2	377	2	423	2	386 2
4% K application at tillering & Jointing stage	361	1	382	1	426	1	390 1
Mean	353		371		417		380
CD (0.05)	Irrigation (A) 34.96		Foliar K (B) N.S.		B within A N.S.		A within B N.S.
<b>1000 grains weight, g</b>							
Control (Water spray)	35.25	3	37.17	3	37.81	3	36.74 3
2% K application at tillering & Jointing stage	35.29	2	37.67	2	38.33	2	37.10 2
4% K application at tillering & Jointing stage	36.07	1	38.13	1	38.49	1	37.56 1
Mean	35.54		37.66		38.21		37.13
CD (0.05)	Irrigation (A) 1.18		Foliar K (B) N.S.		B within A N.S.		A within B N.S.
<b>Grains per ear head</b>							
Control (Water spray)	22.31	1	26.48	1	25.38	1	24.72 1
2% K application at tillering & Jointing stage	22.02	2	25.40	3	23.98	2	23.80 3
4% K application at tillering & Jointing stage	21.71	3	25.87	2	23.84	3	23.81 2
Mean	22.02		25.92		24.40		24.11
CD (0.05)	Irrigation (A) N.S.		Foliar K (B) N.S.		B within A N.S.		A within B N.S.
<b>Biomass, q/ ha</b>							
Control (Water spray)	82.31	3	84.67	3	89.90	3	85.63 3
2% K application at tillering & Jointing stage	85.53	2	88.24	2	93.98	2	89.25 2
4% K application at tillering & Jointing stage	85.82	1	90.87	1	97.43	1	91.37 1
Mean	84.55		87.93		93.77		88.75
CD (0.05)	Irrigation (A) N.S.		Foliar K (B) N.S.		B within A N.S.		A within B N.S.
Date of Sowing:	22.11.2021		Date of Harvesting:			05.05.2022	

<b>Table 6.30. North Eastern Plains Zone</b>		<b>SPL-8</b>		<b>Pooled</b>		<b>2021-22</b>	
Foliar K application		Irrigation levels				Mean	Rk
	One	Rk	Two	Rk	Three	Rk	
<b>Yield, q/ha</b>							
Control (Water spray)	35.50	3	42.12	3	43.07	3	40.23 3
2% K at tillering and jointing	43.35	1	46.71	2	46.21	2	45.42 2
4% K at tillering and jointing	43.17	2	47.92	1	46.61	1	45.90 1
Mean	40.67		45.58		45.30		43.85
CD (0.05)	Irrigation (A) 0.83		Foliar K application (B) 1.17		B within A NS		A within B NS

<b>Earhead/sqm</b>								
Control (Water spray)	260	3	259	3	276	3	265	3
2% K at tillering and jointing	287	2	288	2	293	2	290	2
4% K at tillering and jointing	318	1	303	1	306	1	309	1
Mean	288		283		292		288	
	Irrigation (A)		Foliar K application (B)		B within A		A within B	
CD (0.05)	NS		4		7		14	
<b>Grains/earhead</b>								
Control (Water spray)	16.09	3	21.90	2	21.98	1	19.99	1
2% K at tillering and jointing	16.10	2	22.03	1	21.69	2	19.94	2
4% K at tillering and jointing	21.14	1	21.87	3	15.74	3	19.58	3
Mean	17.78		21.93		19.80		19.84	
	Irrigation (A)		Foliar K application (B)		B within A		A within B	
CD (0.05)	0.38		NS		1.43		1.23	
<b>1000 Grains weight, g</b>								
Control (Water spray)	37.58	3	39.63	3	39.80	3	39.00	3
2% K at tillering and jointing	43.03	1	44.92	1	41.53	1	43.16	1
4% K at tillering and jointing	39.60	2	43.35	2	40.33	2	41.10	2
Mean	40.07		42.63		40.55		41.09	
	Irrigation (A)		Foliar K application (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	

**Centres:** Kanpur and Shillongani

In CZ, this trial was conducted with an objective to reduce moisture stress and to enhance the yield potential of wheat by using potash spray. This trial was conducted with three irrigation levels in main plots and three foliar application of K in sub plots having three replications at four locations (Dhanduka, Durgapura, Jabalpur, Vijapur). The pooled analysis of data of four centres presented in Table 6.31 revealed that maximum and significantly higher grain yield (38.37 q/ha) was produced in three number of irrigations (at CRI, late jointing and milking stage). Among foliar application of K treatments, 4 % K application at tillering and jointing produced significantly higher yield (35.30 q/ha) than 2 % K application at tillering (40-45) and jointing (60-65 DAS) (33.98 q/ha) and control (31.30 q/ha). Significantly higher number of earheads per meter square was responsible for significantly higher grain yields.

In PZ, the experiment on foliar K application was conducted at two locations (Dharwad and Pune). The perusal of pooled data presented in Table 6.32 showed that number of irrigations brought significant effect on grain yield, earheads, grains/earhead and biomass. The maximum mean grain yield of 32.66 q/ha was observed with three irrigation, which was 32.12 and 10.64% higher than mean grain yield under one and two irrigation condition, respectively. Among treatments in sub-plots, the mean grain yield (31.04 q/ha) was maximum with 4% K application as compared to 29.02 and 26.83 q/ha under 2% K application and control, respectively. The increase in grain yield with foliar K application was

in response to more earheads and elevated thousand grains weight over control treatment. The centrewise data are presented in Table 6.32.1 and 6.32.2 of Annexure-I.

<b>Table 6.31. Central Zone</b>	<b>SPL-8</b>		<b>Pooled</b>		<b>2021-22</b>			
Foliar K application	Irrigation levels				Mean	Rk		
	One	Rk	Two	Rk				
<b>Yield, q/ha</b>								
Control (Water spray)	26.24	3	32.42	3	35.25	3	31.30	3
2% K at tillering and jointing	29.10	2	33.76	2	39.09	2	33.98	2
4% K at tillering and jointing	29.63	1	35.50	1	40.77	1	35.30	1
Mean	28.32		33.89		38.37		33.53	
	Irrigation (A)		Foliar K (B)		B within A		A within B	
CD (0.05)	1.03		1.04		NS		NS	
<b>Earhead/sqm</b>								
Control (Water spray)	267	3	307	2	317	3	297	3
2% K at tillering and jointing	274	2	306	3	330	2	303	2
4% K at tillering and jointing	297	1	313	1	338	1	316	1
Mean	279		309		328		305	
	Irrigation (A)		Foliar K (B)		B within A		A within B	
CD (0.05)	7.84		7.20		NS		NS	
<b>Grains/earhead</b>								
Control (Water spray)	26.59	1	26.42	3	26.51	3	26.51	2
2% K at tillering and jointing	26.56	2	27.10	1	27.65	1	27.10	1
4% K at tillering and jointing	25.35	3	26.47	2	27.54	2	26.45	3
Mean	26.17		26.66		27.23		26.69	
	Irrigation (A)		Foliar K (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	
<b>1000 Grains weight, g</b>								
Control (Water spray)	39.98	3	41.37	2	42.76	3	41.37	3
2% K at tillering and jointing	41.26	1	41.35	3	44.00	2	42.21	2
4% K at tillering and jointing	40.88	2	43.90	1	44.72	1	43.16	1
Mean	40.71		42.21		43.83		42.25	
	Irrigation (A)		Foliar K (B)		B within A		A within B	
CD (0.05)	0.88		1.13		NS		NS	
<b>Biomass, q/ha</b>								
Control (Water spray)	61.06	3	78.97	3	84.79	3	74.94	3
2% K at tillering and jointing	64.60	2	80.60	2	92.30	2	79.17	2
4% K at tillering and jointing	64.94	1	84.83	1	94.98	1	81.58	1
Mean	63.53		81.47		90.69		78.56	
	Irrigation (A)		Foliar K (B)		B within A		A within B	
CD (0.05)	2.42		2.61		N.S.		N.S.	

**Centres:** Dhanduka, Durgapura, Jabalpur, Vijapur

<b>Table 6.32. Peninsular Zone</b>		<b>SPL-8</b>		<b>Pooled</b>		<b>2021-22</b>		
Foliar K Application	Irrigation Levels				Three	Rk	Mean	Rk
	One	Rk	Two	Rk				
<b>Yield, q/ha</b>								
Control (Water spray)	23.08	3	27.79	3	29.64	3	26.83	3
2% K application at tillering and jointing	23.40	2	30.03	2	33.64	2	29.02	2
4% K application at tillering and jointing	27.68	1	30.74	1	34.70	1	31.04	1
Mean	24.72		29.52		32.66		28.96	
CD (0.05)	Irrigation (A)		Foliar K Application (B)		B within A		A within B	
	1.43		2.14		N.S.		N.S.	
<b>Earheads/sqm</b>								
Control (Water spray)	178	3	217	3	263	3	219	3
2% K application at tillering and jointing	205	1	218	2	296	1	240	1
4% K application at tillering and jointing	185	2	250	1	269	2	235	2
Mean	189		228		276		231	
CD (0.05)	Irrigation (A)		Foliar K Application (B)		B within A		A within B	
	11.81		12.49		21.63		21.10	
<b>Grains/Earhead</b>								
Control (Water spray)	36.75	2	36.90	1	32.36	2	35.34	2
2% K application at tillering and jointing	30.24	3	35.63	2	30.48	3	32.12	3
4% K application at tillering and jointing	39.19	1	33.70	3	33.95	1	35.61	1
Mean	35.40		35.41		32.26		34.36	
CD (0.05)	Irrigation (A)		Foliar K Application (B)		B within A		A within B	
	2		N.S.		N.S.		N.S.	
<b>1000 Grains Weight, g</b>								
Control (Water spray)	38.46	3	36.80	3	38.00	3	37.75	3
2% K application at tillering and jointing	39.63	1	39.65	1	39.62	1	39.63	1
4% K application at tillering and jointing	39.21	2	38.02	2	39.23	2	38.82	2
Mean	39.10		38.16		38.95		38.73	
CD (0.05)	Irrigation (A)		Foliar K Application (B)		B within A		A within B	
	N.S.		0.71		N.S.		N.S.	
<b>Biomass, q/ha</b>								
Control (Water spray)	52.66	3	59.85	3	72.66	3	61.72	3
2% K application at tillering and jointing	52.87	2	68.41	1	78.88	2	66.72	2
4% K application at tillering and jointing	53.74	1	66.62	2	79.81	1	66.72	1
Mean	53.09		64.96		77.12		65.05	
CD (0.05)	Irrigation (A)		Foliar K Application (B)		B within A		A within B	
	4.32		N.S.		N.S.		N.S.	
<b>Centres:</b>	Dharwad, Pune							

### **SPL-9: Agronomic interventions for quality enhancement in wheat varieties across different wheat growing zones**

In NWPZ, this trial was conducted with an objective to enhance quality of wheat varieties by foliar spray of sulphur (S), nitrogen (N), zinc (Zn), potash (K) and their combinations at four centres (Gurdaspur, Hisar, Ludhiana and Pantnagar). This trial was conducted having four genotypes (HD 3226, HI 1544, DBW 187, and PBW 1 Zn) and with six combinations of foliar fertilization in split plot design replicated thrice. The pooled analysis of data presented in Table 6.33 and 6.34 revealed that the maximum mean grain yield (49.59 q/ha) was produced under the treatment of S+N+Zn+K (all nutrients spray) which remained statistically at par with all treatments except no foliar application of nutrients (control). Among varieties, DBW187 produced the maximum and significantly higher grain yield (53.41 q/ha) than all the other varieties. Maximum and significantly higher iron (Fe) content (37.26 ppm) was recorded in PBW 1 Zn genotype whereas there was no significant difference due to foliar fertilization. Maximum and significantly higher zinc content (39.68 ppm) was found in HD 3226 genotype followed by in PBW 1 Zn genotype (38.28 ppm) and

in treatment of foliar fertilization Zn (41.76ppm) followed by the treatment of S+N+Zn+K (40.86 ppm). Maximum and significantly higher protein content (14.3 %) and maximum hectolitre weight (74.81 kg) was recorded in genotype HD 3226 indicating better quality and density (heaviness) of grains. The centrewise data of yield and quality parameters are given in Table 6.33.1 to 6.33.4 and Table 6.34.1 to 6.34.4 of Annexure-I, respectively.

<b>Table 6.33. North Western Plains Zone</b>		<b>SPL-9</b>				<b>Pooled</b>				<b>2021-22</b>	
Nutrients foliar spray	Variety								Mean	Rk	
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk			
<b>Yield, q/ha</b>											
No foliar fertilization	47.26	6	40.37	6	51.91	6	49.62	6	47.29	6	
S (2% S)	48.75	3	41.25	5	52.41	4	52.16	2	48.64	5	
N (2% Urea)	49.89	1	43.16	3	52.34	5	52.20	1	49.40	3	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	48.30	4	44.25	1	53.95	3	50.82	5	49.33	4	
KCl 1%	47.57	5	43.63	2	54.87	2	51.70	3	49.44	2	
S+N+Zn+KCl	49.30	2	43.08	4	55.02	1	50.95	4	49.59	1	
Mean	48.51		42.62		53.41		51.24		48.95		
C.D. (0.05)		Variety (A)		Nutrients Spray (B)		B within A		A within B			
C.D. (0.05)		1.16		1.06		NS		NS			
<b>Earhead/sq.m.</b>											
No foliar fertilization	330	5	315	6	337	4	332	5	328	6	
S (2% S)	348	1	344	1	332	6	343	1	342	1	
N (2% Urea)	334	3	319	4	346	2	340	2	335	3	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	323	6	338	2	334	5	326	6	330	5	
KCl 1%	340	2	315	5	341	3	334	4	332	4	
S+N+Zn+KCl	333	4	333	3	353	1	334	3	338	2	
Mean	335		327		341		335		334		
C.D. (0.05)		Variety (A)		Nutrients Spray (B)		B within A		A within B			
C.D. (0.05)		6.48		NS		NS		NS			
<b>1000 grains weight, g</b>											
No foliar fertilization	33.14	6	35.76	6	36.03	6	34.42	6	34.84	6	
S (2% S)	33.27	5	35.86	5	36.36	5	34.87	5	35.09	5	
N (2% Urea)	33.79	3	36.01	2	36.75	2	35.75	2	35.58	2	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	33.88	2	36.00	3	36.53	3	35.69	3	35.53	3	
KCl 1%	33.37	4	35.99	4	37.04	1	35.46	4	35.46	4	
S+N+Zn+KCl	34.19	1	37.05	1	36.50	4	35.85	1	35.90	1	
Mean	33.61		36.11		36.54		35.34		35.40		
C.D. (0.05)		Variety (A)		Nutrients Spray (B)		B within A		A within B			
C.D. (0.05)		0.64		NS		NS		NS			
<b>Grains per ear head</b>											
No foliar fertilization	44.59	3	36.77	4	44.33	4	44.32	4	42.50	4	
S (2% S)	43.41	5	34.80	6	44.98	3	44.55	3	41.93	5	
N (2% Urea)	45.66	1	38.52	2	42.50	6	44.19	5	42.72	3	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	45.58	2	37.18	3	45.70	1	44.93	2	43.35	1	
KCl 1%	43.23	6	39.22	1	45.08	2	45.02	1	43.14	2	
S+N+Zn+KCl	44.07	4	35.90	5	43.89	5	43.64	6	41.87	6	
Mean	44.42		37.06		44.41		44.44		42.59		
C.D. (0.05)		Variety (A)		Nutrients Spray (B)		B within A		A within B			
C.D. (0.05)		1.66		NS		NS		NS			
<b>Biomass, q/ha</b>											
No foliar fertilization	136.94	5	120.72	6	142.69	6	138.26	6	134.65	6	
S (2% S)	139.74	3	124.62	2	145.62	4	143.00	1	138.24	3	
N (2% Urea)	141.83	1	124.39	3	145.76	3	142.66	2	138.66	1	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	136.91	6	125.97	1	145.07	5	140.23	5	137.04	5	
KCl 1%	138.20	4	123.45	4	146.05	2	141.98	3	137.42	4	
S+N+Zn+KCl	140.09	2	123.38	5	148.71	1	141.68	4	138.46	2	
Mean	138.95		123.75		145.65		141.30		137.42		
C.D. (0.05)		Variety (A)		Nutrients Spray (B)		B within A		A within B			
C.D. (0.05)		2.89		NS		NS		NS			

Table 6.34. North Western Plains Zone		SPL-9		Pooled		2021-22				
		Variety								
Nutrients foliar spray	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk	Mean	Rk
<b>Fe Content Grains, ppm</b>										
No foliar fertilization	36.67	1	37.33	3	36.87	1	37.10	4	36.99	1
S (2% S)	35.42	6	37.42	2	36.71	2	38.28	1	36.96	2
N (2% Urea)	35.76	4	37.49	1	36.18	5	35.97	6	36.35	6
Zn (0.5% ZnSO4.7H2O)	36.28	2	37.18	4	36.15	6	36.35	5	36.49	5
KCl 1%	35.83	3	36.63	6	36.43	4	38.15	2	36.76	3
S+N+Zn+KCl	35.43	5	36.82	5	36.67	3	37.72	3	36.66	4
Mean	35.90		37.14		36.50		37.26		36.70	
C.D. (0.05)	Variety (A) 0.80		Nutrients Spray (B) NS		B within A NS		A within B NS			
<b>Zn Content Grains, ppm</b>										
No foliar fertilization	38.54	4	35.68	6	36.01	4	36.66	5	36.72	5
S (2% S)	38.66	3	35.88	4	37.39	3	37.98	3	37.48	3
N (2% Urea)	37.66	6	37.30	3	35.63	5	36.44	6	36.76	4
Zn (0.5% ZnSO4.7H2O)	45.69	1	42.13	1	38.98	2	40.25	2	41.76	1
KCl 1%	37.73	5	35.87	5	33.64	6	37.54	4	36.20	6
S+N+Zn+KCl	39.80	2	41.30	2	40.95	1	41.40	1	40.86	2
Mean	39.68		38.03		37.10		38.38		38.30	
C.D. (0.05)	Variety (A) 1.28		Nutrients Spray (B) 1.31		B within A NS		A within B NS			
<b>Protein Content Grains, %</b>										
No foliar fertilization	14.4	4	13.6	5	13.9	3	13.8	5	13.9	4
S (2% S)	14.5	2	13.7	3	13.9	4	13.7	6	14.0	3
N (2% Urea)	14.3	5	14.1	1	14.1	2	14.1	1	14.1	2
Zn (0.5% ZnSO4.7H2O)	13.9	6	13.6	4	13.7	5	13.9	3	13.8	6
KCl 1%	14.4	3	13.6	6	13.7	6	13.8	4	13.9	5
S+N+Zn+KCl	14.5	1	14.1	2	14.2	1	14.0	2	14.2	1
Mean	14.3		13.8		13.9		13.9		14.0	
C.D. (0.05)	Variety (A) 0.22		Nutrients Spray (B) 0.24		B within A NS		A within B NS			
<b>Hectoliter Weight Grains, kg</b>										
No foliar fertilization	74.20	6	74.60	5	75.06	4	74.33	3	74.55	3
S (2% S)	74.58	4	75.57	1	73.85	5	73.89	5	74.47	5
N (2% Urea)	74.86	3	73.79	6	75.06	3	74.37	2	74.52	4
Zn (0.5% ZnSO4.7H2O)	75.52	1	75.11	2	75.16	2	73.77	6	74.89	2
KCl 1%	75.19	2	74.81	3	75.76	1	74.00	4	74.94	1
S+N+Zn+KCl	74.51	5	74.68	4	73.40	6	74.55	1	74.29	6
Mean	74.81		74.76		74.71		74.15		74.61	
C.D. (0.05)	Variety (A) NS		Nutrients Spray (B) 0.60		B within A NS		A within B 1.38			
<b>Starch Content Grains, %</b>										
No foliar fertilization	63.56	6	64.14	5	63.76	4	64.18	3	63.91	6
S (2% S)	63.88	3	64.25	4	63.74	5	64.06	5	63.98	4
N (2% Urea)	63.95	2	63.75	6	64.20	2	64.15	4	64.01	3
Zn (0.5% ZnSO4.7H2O)	64.24	1	64.49	2	64.13	3	63.87	6	64.18	2
KCl 1%	63.75	4	64.52	1	64.44	1	64.19	2	64.23	1
S+N+Zn+KCl	63.66	5	64.28	3	63.48	6	64.32	1	63.93	5
Mean	63.84		64.24		63.96		64.13		64.04	
C.D. (0.05)	Variety (A) 0.20		Nutrients Spray (B) NS		B within A NS		A within B NS			
<b>Moisture Content Grains, %</b>										
No foliar fertilization	10.1	6	10.1	5	10.3	1	10.2	4	10.2	5
S (2% S)	10.2	4	10.3	1	10.2	5	10.1	6	10.2	4
N (2% Urea)	10.2	1	10.0	6	10.0	6	10.2	4	10.1	6
Zn (0.5% ZnSO4.7H2O)	10.1	5	10.2	4	10.3	3	10.3	2	10.2	3
KCl 1%	10.2	2	10.2	3	10.2	4	10.3	1	10.2	2
S+N+Zn+KCl	10.2	3	10.2	2	10.3	2	10.2	3	10.2	1
Mean	10.2		10.2		10.2		10.2		10.2	
C.D. (0.05)	Variety (A) NS		Nutrients Spray (B) NS		B within A NS		A within B NS			

Centres: Gurdaspur, Hisar, Ludhiana and Pantnagar

**Table 6.35. North Eastern Plains Zone SPL-9 Kanpur 2021-22**

Foliar Fertilization	Variety		SPL-9		Kanpur		2021-22			
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW1	Rk	Mean	Rk
<b>Yield,q/ha</b>										
No foliar fertilization	24.88	6	24.18	5	25.76	6	25.81	5	25.16	6
S (2% S)	27.54	5	29.85	4	29.97	4	24.99	6	28.09	4
N (2% Urea)	28.24	3	22.45	6	31.43	3	28.93	4	27.76	5
Zn (0.5% ZnSO4.7H2O)	28.00	4	38.88	1	29.51	5	31.71	2	32.03	3
KCl 1%	37.38	1	31.73	3	31.48	2	30.78	3	32.84	2
S+N+Zn+KCl	36.34	2	33.82	2	36.22	1	34.72	1	35.27	1
Mean	30.40		30.15		30.73		29.49		30.19	
CD (0.05)	Variety (A) NS		Foliar application(B) 2.30		B within A 4.60		A within B 4.30			
<b>Earhead/sqm</b>										
No foliar fertilization	390	5	387	6	354	6	409	5	385	6
S (2% S)	408	4	423	3	407	5	433	4	418	5
N (2% Urea)	420	3	445	2	470	4	397	6	433	4
Zn (0.5% ZnSO4.7H2O)	389	6	423	3	489	3	485	2	447	3
KCl 1%	494	1	418	5	541	2	533	1	496	1
S+N+Zn+KCl	445	2	464	1	551	1	454	3	479	2
Mean	424		427		469		452		443	
CD (0.05)	Variety (A) 10		Foliar application(B) 9		B within A 19		A within B 19			
<b>Grains/earhead</b>										
No foliar fertilization	17.50	6	18.86	5	19.58	1	13.93	4	17.47	5
S (2% S)	18.41	4	21.10	3	19.55	2	12.71	5	17.94	3
N (2% Urea)	18.32	5	14.97	6	17.93	3	16.06	2	16.82	6
Zn (0.5% ZnSO4.7H2O)	19.61	3	27.15	1	15.96	5	14.31	3	19.26	1
KCl 1%	20.49	2	22.54	2	15.26	6	12.67	6	17.74	4
S+N+Zn+KCl	22.10	1	21.05	4	16.99	4	16.51	1	19.16	2
Mean	19.41		20.95		17.55		14.36		18.07	
CD (0.05)	Variety (A) 0.9		Foliar application(B) 1.4		B within A 2.8		A within B 2.6			
<b>1000 grains weight, g</b>										
No foliar fertilization	36.51	6	33.17	6	37.27	6	45.33	6	38.07	6
S (2% S)	36.72	3	33.57	5	37.65	4	45.48	4	38.35	4
N (2% Urea)	36.72	4	33.72	3	37.29	5	45.36	5	38.27	5
Zn (0.5% ZnSO4.7H2O)	36.63	5	33.79	2	37.89	3	45.63	2	38.49	3
KCl 1%	36.92	2	33.70	4	38.12	2	45.61	3	38.59	2
S+N+Zn+KCl	36.98	1	34.60	1	38.70	1	46.33	1	39.15	1
Mean	36.75		33.76		37.82		45.62		38.49	
CD (0.05)	Variety (A) 0.63		Foliar application(B) 0.24		B within A NS		A within B NS			
<b>Fe, ppm</b>										
No foliar fertilization	37.6	3	39.5	3	37.2	3	35.8	6	37.5	3
S (2% S)	37.9	2	35.5	6	32.6	6	37.0	2	35.8	6
N (2% Urea)	35.8	6	37.1	5	35.8	5	36.0	4	36.2	5
Zn (0.5% ZnSO4.7H2O)	37.2	5	38.5	4	35.9	4	35.9	5	36.9	4
KCl 1%	37.2	4	40.6	2	37.7	2	36.8	3	38.1	2
S+N+Zn+KCl	38.8	1	42.8	1	40.3	1	37.9	1	40.0	1
Mean	37.4		39.0		36.6		36.6		37.4	
CD (0.05)	Variety (A) 0.7		Foliar application(B) 1.7		B within A NS		A within B NS			
<b>Zn, ppm</b>										
No foliar fertilization	37.1	5	36.5	5	34.7	5	36.6	6	36.2	5
S (2% S)	35.9	6	36.2	6	33.9	6	38.3	4	36.1	6
N (2% Urea)	38.6	3	36.8	4	36.8	4	42.7	3	38.7	3
Zn (0.5% ZnSO4.7H2O)	49.0	1	47.8	1	49.1	1	49.1	1	48.8	1
KCl 1%	37.3	4	38.0	3	37.6	3	37.8	5	37.7	4
S+N+Zn+KCl	46.0	2	46.0	2	38.5	2	45.3	2	44.0	2
Mean	40.7		40.2		38.4		41.6		40.2	
CD (0.05)	Variety (A) NS		Foliar application(B) 2.2		B within A NS		A within B NS			

Table 6.36. Central Zone

Foliar Fertilization	SPL 9				Vijapur				2021-22	
	Variety				Variety					
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk	Mean	Rk
	<b>Yield, q/ha</b>									
No foliar fertilization	44.08	2	45.50	3	42.48	3	44.83	2	44.22	3
S (2% S)	42.46	6	41.67	6	40.79	5	40.54	6	41.36	6
N (2% Urea)	47.54	1	44.50	4	47.75	1	41.04	5	45.21	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	42.75	4	45.54	2	42.46	4	44.29	3	43.76	4
KCl 1%	42.50	5	46.67	1	40.75	6	47.00	1	44.23	2
S+N+Zn+KCl	43.13	3	41.75	5	44.33	2	43.29	4	43.13	5
Mean	43.74		44.27		43.09		43.50		43.65	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		N.S.		N.S.			
	<b>Earhead/sq.m.</b>									
No foliar fertilization	387	4	372	5	381	5	428	2	392	3
S (2% S)	394	3	379	3	415	2	345	4	383	5
N (2% Urea)	372	6	374	4	378	6	344	5	367	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	385	5	442	1	389	3	410	3	407	2
KCl 1%	424	2	384	2	388	4	430	1	407	1
S+N+Zn+KCl	427	1	363	6	429	1	331	6	387	4
Mean	398		386		397		381		390	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		N.S.		N.S.			
	<b>Grains/earhead</b>									
No foliar fertilization	24.6	1	23.8	2	24.6	1	21.0	6	23.5	2
S (2% S)	23.8	3	22.3	6	20.5	6	23.1	4	22.4	6
N (2% Urea)	24.5	2	26.8	1	23.7	2	25.7	2	25.2	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	22.4	4	22.4	5	22.0	5	24.6	3	22.9	4
KCl 1%	21.6	5	23.5	3	23.3	3	21.8	5	22.6	5
S+N+Zn+KCl	21.3	6	22.5	4	22.7	4	26.8	1	23.3	3
Mean	23.0		23.6		22.8		23.8		23.3	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		N.S.		N.S.			
	<b>1000 grains wt, g</b>									
No foliar fertilization	46.44	5	51.27	3	45.41	5	49.92	3	48.26	5
S (2% S)	46.89	4	49.43	4	48.29	3	51.04	2	48.91	2
N (2% Urea)	52.30	1	44.88	6	53.22	1	46.42	5	49.21	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	49.88	2	46.40	5	49.57	2	44.58	6	47.61	6
KCl 1%	46.31	6	51.71	1	45.07	6	51.33	1	48.60	4
S+N+Zn+KCl	48.59	3	51.29	2	46.32	4	48.89	4	48.77	3
Mean	48.40		49.16		47.98		48.70		48.56	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		3.74		3.95			
	<b>Biomass, q/ha</b>									
No foliar fertilization	120.54	1	106.71	5	112.79	2	106.29	5	111.58	2
S (2% S)	99.88	6	118.83	2	96.96	6	111.46	3	106.78	6
N (2% Urea)	108.21	4	120.83	1	110.67	4	110.88	4	112.65	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	113.58	3	107.00	4	116.25	1	104.25	6	110.27	5
KCl 1%	115.46	2	103.25	6	112.08	3	114.88	2	111.42	3
S+N+Zn+KCl	101.63	5	117.63	3	102.50	5	122.75	1	111.13	4
Mean	109.88		112.38		108.54		111.75		110.64	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		16.43		16.41			
	<b>Fe, ppm</b>									
No foliar fertilization	35.43	2	35.23	2	32.10	6	36.03	5	34.70	6
S (2% S)	33.57	6	34.00	4	36.30	2	38.00	3	35.47	3
N (2% Urea)	35.90	1	32.47	6	35.67	3	38.67	2	35.68	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	34.97	3	34.90	3	36.33	1	37.07	4	35.82	1
KCl 1%	34.33	5	32.67	5	33.33	5	39.67	1	35.00	5
S+N+Zn+KCl	34.63	4	36.60	1	33.33	4	35.70	6	35.07	4
Mean	34.81		34.31		34.51		37.52		35.29	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	1.42		N.S.		N.S.		N.S.			



<b>Zn, ppm</b>										
No foliar fertilization	33.37	6	36.93	4	31.37	4	41.10	3	35.69	4
S (2% S)	37.47	3	36.20	5	34.33	3	39.30	4	36.83	3
N (2% Urea)	34.00	5	34.57	6	29.47	6	35.13	6	33.29	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	39.60	2	39.27	2	40.10	1	44.50	1	40.87	2
KCl 1%	34.80	4	38.10	3	30.10	5	37.20	5	35.05	5
S+N+Zn+KCl	47.57	1	48.10	1	37.37	2	43.73	2	44.19	1
Mean	37.80		38.86		33.79		40.16		37.65	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	3.7		2.64		N.S.		N.S.			
<b>Hectolitre weight, kg</b>										
No foliar fertilization	80.25	3	81.97	1	80.12	4	81.13	2	80.87	1
S (2% S)	80.44	2	81.73	3	80.43	2	80.51	6	80.78	3
N (2% Urea)	80.59	1	81.57	5	79.98	6	81.14	1	80.82	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	80.05	5	81.73	2	80.52	1	80.66	5	80.74	4
KCl 1%	80.21	4	81.64	4	80.04	5	80.87	3	80.69	5
S+N+Zn+KCl	79.99	6	81.40	6	80.32	3	80.80	4	80.63	6
Mean	80.26		81.67		80.23		80.85		80.75	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	0.13		N.S.		N.S.		N.S.			
<b>Protein, %</b>										
No foliar fertilization	10.47	3	10.33	2	10.13	4	10.13	5	10.27	4
S (2% S)	10.23	6	10.17	4	10.30	2	10.50	1	10.30	3
N (2% Urea)	10.53	2	10.03	6	10.43	1	10.33	3	10.33	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	10.47	3	10.43	1	9.83	6	10.13	5	10.22	6
KCl 1%	10.37	5	10.13	5	10.17	3	10.23	4	10.23	5
S+N+Zn+KCl	10.90	1	10.23	3	9.93	5	10.40	2	10.37	1
Mean	10.49		10.22		10.13		10.29		10.28	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		N.S.		N.S.			
<b>Moisture %</b>										
No foliar fertilization	9.57	2	9.40	3	9.53	2	9.07	5	9.39	2
S (2% S)	8.93	5	9.50	2	9.03	5	9.30	3	9.19	6
N (2% Urea)	8.93	6	9.03	6	10.03	1	9.13	4	9.28	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	9.57	1	9.33	4	9.30	3	9.47	1	9.42	1
KCl 1%	9.27	4	9.73	1	9.30	3	8.97	6	9.32	4
S+N+Zn+KCl	9.57	2	9.27	5	9.03	5	9.47	1	9.33	3
Mean	9.31		9.38		9.37		9.23		9.32	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		0.32		0.32			
<b>Starch, %</b>										
No foliar fertilization	67.03	5	66.93	5	66.80	4	67.67	2	67.11	3
S (2% S)	67.77	1	67.23	4	66.60	5	66.73	5	67.08	5
N (2% Urea)	67.40	2	67.87	1	66.17	6	67.23	3	67.17	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	67.30	3	66.70	6	67.17	1	67.20	4	67.09	4
KCl 1%	67.20	4	67.47	2	67.10	3	67.90	1	67.42	1
S+N+Zn+KCl	66.40	6	67.40	3	67.13	2	66.60	6	66.88	6
Mean	67.18		67.27		66.83		67.22		67.13	
CD (0.05)	Variety (A)		Fertilization (B)		B within A		A within B			
	N.S.		N.S.		0.72		0.94			

In NEPZ, this experiment was conducted at Kanpur center only. The analyzed data is presented in Table 6.35. The perusal of data revealed that there was significant effects of foliar spray of S, N, Zn, K and their combinations on the grain yield, whereas different genotypes vary non-significantly. The highest grain yield (38.88 q/ha) and grains per earhead were observed in HI 1544 genotype when Zn (0.5% ZnSO<sub>4</sub>.7H<sub>2</sub>O) was sprayed. Significantly higher Fe content was observed through foliar spray of S+N+Zn+KCl, whereas foliar spray of Zn (0.5% ZnSO<sub>4</sub>.7H<sub>2</sub>O) resulted in significantly higher Zn content.

In CZ, this trial was conducted at Vijapur centre. This trial was conducted with four genotypes (HD 3226, HI 1544, DBW 187, and PBW 1 Zn) and six combinations of foliar fertilization in split plot design and replicated thrice. The analysis of data presented in Table 6.36 revealed that no significant effect of genotypes and foliar fertilization were observed for yield and yield attributes. Maximum grain yield (45.21 q/ha) was produced under the treatment of N (2% urea spray) though statistically all treatments remained at par. Maximum and significantly higher Fe content (37.52 ppm) was recorded in PBW 1 Zn genotype however there was no significant difference due to foliar fertilization. Maximum and significantly higher zinc content (40.16 ppm) was found in PBW 1 Zn genotype and among foliar fertilization treatment S+N+Zn+KCl. Maximum and significantly higher hectolitre weight (81.67) was found in genotype HI 1544.

#### **SPL- 10: Effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat**

An experiment on evaluation of the effect of NPK solubilizing microbial (Rhizosphere) consortium on productivity of wheat under irrigated condition was conducted at one location (Shimla) in NHZ. The four rates of NPK fertilizers, control (No NPK), 50% Recommended NPK, 75% Rec. NPK and 100% Rec NPK were applied in combination of with and without seed treatment of NPK solubilizing microbial (Rhizosphere) consortium. For seed treatment, 2.5 ml of NPK solubilizing microbial (Rhizosphere) consortium was diluted to 25 ml with water and a pinch of sugar is added to it. This suspension is then sprinkled on the seeds and thoroughly mixed to have uniform coating. The treated seeds were then dried in shade before seeding. The recommended dose of NPK was 150:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O. Full dose of P and K and 1/3<sup>rd</sup> dose of N were applied as basal. Remaining 2/3<sup>rd</sup> N was applied in to two equal splits at first and second irrigation.

In NHZ, the application of recommended dose of NPK with and without seed treatment recorded significantly higher grain yield compared to all the lower doses of NPK applied with and without seed treatment (Table 6.37). The lowest grain yield (17.85 q/ha) was recorded in control plots (no fertilizer and no seed treatment). The wheat grain yield was significantly increased with the increase in NPK rates. The seed treatment did not cause any significant

yield improvement except at 75% Rec NPK rates. The absolute control plots recorded lesser earhead density, thinner grains, lesser biomass and shortest plants. Whereas, the treatment of 100% Rec NPK with seed treatment recorded highest earhead density (331/m<sup>2</sup>), 1000 grains weight (44.0 g), and biomass (109.52 q/ha).

**Table 6.37. Northern Hill Zone**

Treatments	SPL-10		Shimla	2021-22		
	Earheads/ m <sup>2</sup>	1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha	Plant ht., cm
Control	191	41.33	22.65	17.85	60.54	78.3
Control + Bio NPK @2.5 ml/kg seed treatment	202	42.67	21.00	18.00	67.34	79.3
50% Rec. NPK	266	43.33	23.81	27.30	81.63	87.3
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	275	43.00	23.29	27.46	82.31	87.3
75% Rec. NPK	282	44.00	23.56	28.89	95.24	91.7
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	296	43.67	23.25	30.00	95.91	89.0
100% Rec NPK	325	43.67	23.53	33.30	108.16	94.3
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	331	44.00	23.14	33.58	109.52	89.7
CD (0.05)	17.84	1.85	1.65	1.00	4.96	4.88

In NWPZ, this experiment was conducted at five centres viz., Gurdaspur, Hisar, Jammu, Karnal and Ludhiana. The experiment was conducted in RBD design having control, 50% recommended NPK, 75% NPK and 100% NPK with and without seed treatment (Bio NPK @2.5 ml/kg). The recommended dose of fertilizer was maintained as 150:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen was applied during first and second irrigation equally. The pooled data of all the five centres presented in Table 6.38 showed that the maximum grain yield of 57.05 q/ha was recorded with 100% NPK + seed treatment with Bio NPK @2.5 ml/kg followed by 54.50 q/ha with 100% NPK. The seed treatment with Bio NPK @2.5 ml/kg brought about significant improvement in grain yield only under control and with 100% NPK treatments. The significant change in biomass with seed treatment was observed only with treatment of 100% NPK. The effect of seed treatment with Bio NPK @2.5 ml/kg in remaining conditions and traits was not significant. The centre wise data have been illustrated in Tables 6.38.1 to 6.38.5 of Annexure-I.

**Table 6.38. North Western Plains Zone**

Treatments	Yield, q/ha	SPL-10		Pooled	2021-22	
		Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass , q/ha	Plant Ht., cm
Control	32.51	281	38.20	31.14	88.89	90.29
Control + Bio NPK @2.5 ml/kg seed treatment	34.32	283	37.95	32.54	91.79	92.51
50% Rec. NPK	47.79	335	38.34	38.66	125.60	99.38
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	48.49	324	37.82	40.94	126.56	101.11
75% Rec. NPK	51.75	367	37.19	40.27	137.98	102.31
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	52.54	339	37.44	42.66	139.23	103.93
100% Rec NPK	54.50	351	37.50	43.33	147.20	105.29
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	57.05	360	38.06	43.24	151.83	105.51
CD (0.05)	1.68	16.19	0.66	2.05	3.84	1.63

Centres: Gurdaspur, Hisar, Jammu, Karnal and Ludhiana

In NEPZ, this experiment was conducted at three locations (IARI PUSA, RPCAU PUSA and Varanasi). The pooled analyzed data of these centres are presented in Table 6.39. The perusal of data revealed that the maximum grain yield (42.6 q/ha) was obtained under 100% recommended NPK + seed treatment with Bio NPK @ 2.5 ml/kg and was significantly superior to all other treatments except 100% recommended NPK . This gain in grain yield was due to more earhead density and bold grains. The yield gain in 100% recommended NPK + seed treatment with Bio NPK @ 2.5 ml/kg treatment over control was 91.9 %. Similar trend was observed in bio mass yield. Centre wise data are given in Tables 6.39.1 to 6.39.3 of Annexure-I.

In CZ, this trial was conducted at three locations (Indore, Junagadh, Vijapur). The pooled analysis of data of three centres presented in Table 6.40 revealed that maximum grain yield (54.87 q/ha) was produced by the treatment 100% Rec. NPK + seed treatment with Bio NPK @2.5ml/kg followed by 100% Rec. NPK (54.25 q/ha) and both these treatments remained statistically at par. The grain yield produced with 100% recommended NPK application either with or without seed treatment was significantly higher compared to other treatments.

**Table 6.39. North Eastern Plains Zone**

Treatments	SPL-10		Pooled	2021-22	
	Earheads/ sqm	Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Biomass, q/ha
Control	168	36.4	37.8	22.2	57.5
Control + Bio NPK @2.5 ml/kg seed treatment	175	36.7	38.4	24.0	57.3
50% Rec. NPK	175	42.3	39.2	30.3	75.3
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	182	42.6	40.2	30.9	76.3
75% Rec. NPK	190	45.2	40.1	34.4	86.0
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	195	45.5	40.8	36.1	89.8
100% Rec NPK	214	48.6	40.1	41.4	99.9
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	220	47.0	41.6	42.6	99.9
CD ( 0.05)	8	4.1	1.0	1.2	4.3

**Centres:** IARI PUSA, RPCAU PUSA and Varanasi

**Table 6.40. Central Zone**

Treatments	SPL 10		Pooled	2021-22		
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
Control	254	20.0	47.73	22.81	67.1	65.65
Control + Bio NPK @2.5 ml/kg seed treatment	272	19.3	47.55	22.72	67.5	60.78
50% Rec. NPK	328	27.4	50.15	43.23	81.0	100.44
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	334	27.5	49.46	44.99	82.3	103.70
75% Rec. NPK	382	27.1	50.00	50.27	83.3	114.53
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	379	26.7	49.97	50.23	83.3	115.82
100% Rec NPK	408	27.3	49.87	54.25	86.0	126.45
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	437	26.1	48.05	54.87	86.7	127.49
CD (0.05)	24.94	2.02	1.80	2.27	1.83	3.93

**Centres :** Indore, Junagadh, Vijapur

In PZ, this experiment was conducted at Pune centre. The data of Pune centre presented in Table 6.41 showed that the maximum grain yield of 55.77 q/ha was recorded with 100% NPK + seed treatment with Bio NPK @2.5 ml/kg followed by 53.78 q/ha with 100% NPK. The seed treatment made significant improvement in grain yield only under control and 100% NPK treatments. The significant change in biomass with seed treatment was observed only with treatment of 100% NPK. The effect of seed treatment in remaining condition and traits was not significant.

Treatments	SPL-10		Pune		2021-22	
	Yield, q/ha	Earhead/ sqm	1000 grains weight, g	Grains/ earhead	Plant Ht., cm	Biomass, q/ha
Control	36.59	265	34.10	40.49	98.60	83.00
Control + Bio NPK @2.5 ml/kg seed treatment	38.74	276	34.40	40.92	102.67	83.40
50% Rec. NPK	46.08	305	36.20	41.81	113.90	85.00
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	47.84	312	36.80	41.80	118.10	85.40
75% Rec. NPK	50.89	326	38.50	40.57	129.77	87.20
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	51.30	331	38.90	39.82	134.80	87.80
100% Rec NPK	53.78	344	40.54	38.59	146.90	89.50
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	55.77	349	40.63	39.30	150.67	90.60
CD (0.05)	1.86	9.05	1.22	2.23	8.18	1.08

### **SPL-11: Improving wheat productivity through silica foliar application**

In PZ, the experiment on foliar silica application (KSi) was conducted at Dharwad centre. The experiment was conducted in split-plot design having irrigation levels (one, two and three) in main plots and foliar silica application (control, 2 ml KSi/litre of water at tillering & jointing and 4 ml KSi/litre of water at tillering & jointing) in sub-plots. The recommended dose of fertilizer was maintained as 120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen was applied during first and second irrigation equally. The seed rate of 100 kg/ha for timely sown conditions (adjust seed rate considering 1000 grains weight as 38 g) was used in the experiment. The data of Dharwad centre presented in Table 6.42 showed that neither irrigation levels nor foliar silica application could not make significant effect on grain yield. The mean grain yield across irrigation levels was found in the range of 27.66-30.28 q/ha while across the foliar silica application, it was between 27.39-31.09 q/ha. The increase in number of irrigation levels raised the biomass yield with maximum value of 58.11 q/ha under three irrigation levels. The maximum value of earheads, thousand grains weight and biomass was observed with foliar application of 2 ml Silica (KSi)/litre of water at tillering & jointing stage.

**Table 6.42. Peninsular Zone**

Foliar Silica (Ksi) Application	SPL-11				Dharwad		2021-22	
	Irrigation Levels						Mean	Rk
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	26.03	3	27.33	3	28.81	3	27.39	3
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	29.37	1	31.23	1	32.68	1	31.09	1
4 ml Silica (KSi)/litre of water application at tillering and jointing	27.58	2	28.87	2	29.34	2	28.60	2
Mean	27.66		29.14		30.28		29.03	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	N.S.		N.S.		N.S.		N.S.	
<b>Earheads/sqm</b>								
Control (Water spray)	174	3	181	3	204	3	187	3
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	228	1	232	1	239	1	233	1
4 ml Silica (KSi)/litre of water application at tillering and jointing	200	2	211	2	221	2	211	2
Mean	201		208		221		210	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	N.S.		21.07		N.S.		N.S.	
<b>Grains/Earhead</b>								
Control (Water spray)	48.37	1	46.01	1	40.74	1	45.04	1
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	35.52	3	34.58	3	35.39	2	35.16	3
4 ml Silica (KSi)/litre of water application at tillering and jointing	41.60	2	37.12	2	35.28	3	38.00	2
Mean	41.83		39.24		37.13		39.40	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	N.S.		5.69		N.S.		N.S.	
<b>1000 Grains Weight, g</b>								
Control (Water spray)	31.00	3	32.91	3	34.92	3	32.95	3
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	36.42	1	38.97	1	38.90	1	38.10	1
4 ml Silica (KSi)/litre of water application at tillering and jointing	34.91	2	36.80	2	38.14	2	36.62	2
Mean	34.11		36.23		37.32		35.89	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	N.S.		2.02		N.S.		N.S.	
<b>Lodging Score</b>								
Control (Water spray)	2.17	1	2.13	1	2.03	1	2.11	1
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	1.33	3	1.63	2	1.30	3	1.42	3
4 ml Silica (KSi)/litre of water application at tillering and jointing	1.53	2	1.53	3	1.43	2	1.50	2
Mean	1.68		1.77		1.59		1.68	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	N.S.		0.25		N.S.		N.S.	
<b>Biomass, q/ha</b>								
Control (Water spray)	40.79	3	42.77	3	46.97	3	43.51	3
2 ml Silica (KSi)/litre of water application at tillering (40-45) and jointing (60-65 DAS)	59.07	1	64.40	1	66.65	1	63.37	1
4 ml Silica (KSi)/litre of water application at tillering and jointing	46.60	2	51.10	2	60.72	2	52.80	2
Mean	48.82		52.75		58.11		53.23	
CD (0.05)	Irrigation (A)		Foliar KSi (B)		B within A		A within B	
	4.97		5.81		N.S.		N.S.	

## SPL-12: Improving wheat productivity through nutrients solubilizing microbial (Rhizosphere) consortium

In PZ, this experiment was conducted at Dharwad centre. The experiment was conducted in RBD design having control, seed treatment with microbial consortium @ 2ml/kg and 4 ml/kg each with 50% recommended dose of NPK and 75% NPK, combination of seed treatment and spray (2 ml/kg seed treatment + spray of 2% microbial consortium at 20-25 DAS and 4 ml/kg seed treatment + spray of 4% microbial consortium at 20-25 DAS with 50% and 75% recommended dose of NPK and seed treatment (2 and 4 ml/kg) with 100% NPK. The recommended dose of fertilizer was maintained as 120:60:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ha. One third nitrogen, full phosphorus and potash were applied as basal dose and the remaining 2/3<sup>rd</sup> nitrogen was applied during first and second irrigation equally. In all treatments, recommended dose of 15 t/ha FYM was applied uniformly. The data of Dharwad centre presented in Table 6.43 showed that the maximum grain yield of 38.73 q/ha was recorded with 75% Rec. NPK + seed treatment with microbial consortium @4 ml/kg seed + 4% microbial consortium spray at 20-25 DAS as compared to 18.91 q/ha for control treatment.

Table 6.43. Peninsular Zone	SPL-12			Dharwad			2021-22
	Yield, q/ha	Earhead/ sqm	1000 grains weight, g	Grains/ earhead	Plant Ht., cm	Lodging Score	Biomass, q/ha
50% Rec. NPK + seed treatment with microbial consortium 2 ml/kg seed	27.55	179	31.92	49.09	66.10	4.83	39.75
50% Rec. NPK + seed treatment with microbial consortium 4 ml/kg seed	30.04	191	31.77	50.85	68.83	4.33	44.71
75% Rec. NPK + seed treatment with microbial consortium 2 ml/kg seed	29.04	186	35.00	44.73	68.60	4.23	47.17
75% Rec. NPK + seed treatment with microbial consortium 4 ml/kg seed	32.65	200	34.21	48.05	71.27	4.13	49.40
50% Rec. NPK + seed treatment with microbial consortium 2 ml/kg seed + 2% microbial consortium spray at 20-25 days after sowing (DAS)	32.94	201	36.49	46.51	70.77	3.80	51.22
50% Rec. NPK + seed treatment with microbial consortium 4 ml/kg seed + 4% microbial consortium spray at 20-25 days after sowing (DAS)	36.04	202	36.99	48.70	70.97	3.47	57.24
75% Rec. NPK + seed treatment with microbial consortium 2 ml/kg seed + 2% microbial consortium spray at 20-25 days after sowing (DAS)	37.21	206	37.58	48.25	76.67	3.43	59.20
75% Rec. NPK + seed treatment with microbial consortium 4 ml/kg seed + 4% microbial consortium spray at 20-25 days after sowing (DAS)	38.73	210	39.51	46.88	76.77	3.40	61.63
100% Rec. NPK + seed treatment with microbial consortium 2 ml/kg seed	37.83	203	39.92	46.69	78.50	3.07	59.75
100% Rec. NPK + seed treatment with microbial consortium 4 ml/ kg seed	38.63	208	40.36	46.68	76.47	3.07	60.37
Absolute Control	18.91	156	27.48	47.70	63.20	2.90	33.26
CD (0.05)	6.45	33.55	5.24	17.41	11.23	1.81	8.05

<b>Table 1.1. Northern Hill Zone</b>		<b>RIR-TS-TAS Centrewise</b>			<b>Yield, q/ha</b>	<b>2021-22</b>
<b>Irrigation</b>	<b>Genotype</b>	<b>Almora</b>	<b>Bajaura</b>	<b>Malan</b>	<b>Shimla</b>	<b>Zonal mean</b>
Zero	HPW 349 (C)	41.11	44.13	31.51	25.33	35.52
	VL 2041	44.72	42.63	26.10	22.25	33.92
	VL 907 (C)	42.69	41.79	24.38	29.07	34.48
	HS 562 (C)	46.67	47.29	27.09	29.37	37.61
	HS 507 (C)	45.74	45.17	30.97	24.59	36.62
	Mean	44.19	44.20	28.01	26.12	35.63
One	HPW 349 (C)	41.94	45.42	32.06	27.44	36.72
	VL 2041	47.31	49.25	23.91	23.89	36.09
	VL 907 (C)	46.48	46.38	27.17	30.37	37.60
	HS 562 (C)	48.15	46.63	32.13	36.34	40.81
	HS 507 (C)	48.24	47.54	36.40	25.09	39.32
	Mean	46.43	47.04	30.33	28.63	38.11
Two	HPW 349 (C)	43.24	48.31	36.62	35.54	40.93
	VL 2041	47.13	51.67	32.71	24.56	39.02
	VL 907 (C)	46.67	52.71	34.81	31.32	41.38
	HS 562 (C)	50.46	46.21	34.85	40.62	43.04
	HS 507 (C)	50.09	48.54	39.85	27.38	41.47
	Mean	47.52	49.49	35.77	31.88	41.16
Mean	HPW 349 (C)	42.10	45.95	33.40	29.44	37.72
	VL 2041	46.39	47.85	27.57	23.56	36.34
	VL 907 (C)	45.28	46.96	28.78	30.25	37.82
	HS 562 (C)	48.43	46.71	31.36	35.44	40.48
	HS 507 (C)	48.02	47.08	35.74	25.69	39.13
	Mean	46.04	46.91	31.37	28.88	38.30
CD (0.05)	Irrigation (A)	0.99	1.66	4.04	2.02	1.01
	Genotype (B)	2.19	NS	2.29	1.81	0.94
	B within A	NS	2.23	NS	3.13	NS
	A within B	NS	2.40	NS	3.23	NS
Date of Sowing:		01.11.2021	26.10.2021	11.11.2021	25.10.2021	
Date of Harvesting:		29.04.2022		30.04.2022	10.05.2022	



<b>Table 1.2. Northern Hill Zone</b>		<b>RIR-TS-TAS</b>		<b>Pooled</b>		<b>2021-22</b>		
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	35.52	3	36.72	4	40.93	4	37.72	4
VL 2041	33.92	5	36.09	5	39.02	5	36.34	5
VL 907 (C)	34.48	4	37.60	3	41.38	3	37.82	3
HS 562 (C)	37.61	1	40.81	1	43.04	1	40.48	1
HS 507 (C)	36.62	2	39.32	2	41.47	2	39.13	2
Mean	35.63		38.11		41.16		38.30	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	1.01		0.94		NS		NS	
<b>Earhead/sqm</b>								
HPW 349 (C)	297	3	332	2	353	3	327	3
VL 2041	286	5	310	5	326	4	307	4
VL 907 (C)	292	4	313	4	314	5	306	5
HS 562 (C)	305	1	337	1	356	1	332	1
HS 507 (C)	303	2	330	3	355	2	329	2
Mean	296		324		341		320	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	11.47		10.05		NS		NS	
<b>Grains/Earhead</b>								
HPW 349 (C)	28.83	3	27.22	5	28.32	5	28.12	5
VL 2041	29.29	2	27.64	4	28.38	4	28.44	4
VL 907 (C)	28.66	5	27.85	3	31.48	1	29.33	3
HS 562 (C)	30.11	1	29.72	2	29.96	2	29.93	1
HS 507 (C)	28.78	4	30.20	1	29.19	3	29.39	2
Mean	29.14		28.53		29.47		29.04	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	42.18	4	42.57	4	42.92	3	42.56	3
VL 2041	41.53	5	42.74	3	43.29	2	42.52	4
VL 907 (C)	42.42	2	44.13	1	43.46	1	43.34	1
HS 562 (C)	42.38	3	44.03	2	42.32	4	42.91	2
HS 507 (C)	42.86	1	41.59	5	41.89	5	42.11	5
Mean	42.27		43.01		42.78		42.69	
	Irrigation (A)		Genotype (B)		B within A		A within B	
CD (0.05)	NS		NS		NS		NS	

**Centers:** Almora, Bajaura, Malan, Shimla

Table 1.2.1 Northern Hill Zone			RIR-TS-TAS			Almora	2021-22	
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	41.11	5	41.94	5	43.24	5	42.10	5
VL 2041	44.72	3	47.31	3	47.13	3	46.39	3
VL 907 (C)	42.69	4	46.48	4	46.67	4	45.28	4
HS 562 (C)	46.67	1	48.15	2	50.46	1	48.43	1
HS 507 (C)	45.74	2	48.24	1	50.09	2	48.02	2
Mean	44.19		46.43		47.52		46.04	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.33		0.99		2.76	
Genotype (B)	**		0.90		2.19		5.89	
B within A	N.S.		1.57		3.79			
A within B			1.44		3.48			
<b>Earhead/sqm</b>								
HPW 349 (C)	262	3	255	4	270	4	262	4
VL 2041	262	3	282	1	282	3	275	2
VL 907 (C)	252	5	273	2	250	5	258	5
HS 562 (C)	263	2	268	3	305	1	279	1
HS 507 (C)	285	1	250	5	290	2	275	2
Mean	265		266		279		270	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		16.39		49.40		23.51	
Genotype (B)	N.S.		10.52		25.44		11.69	
B within A	N.S.		18.21		44.07			
A within B			23.11		55.91			
<b>Grains/Earhead</b>								
HPW 349 (C)	39.91	5	40.27	5	40.45	5	40.21	5
VL 2041	43.72	2	42.31	3	42.99	3	43.01	4
VL 907 (C)	42.18	3	41.73	4	47.38	1	43.76	3
HS 562 (C)	46.06	1	45.23	2	42.38	4	44.56	1
HS 507 (C)	40.39	4	48.21	1	44.23	2	44.28	2
Mean	42.45		43.55		43.49		43.16	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		2.42		7.31		21.75	
Genotype (B)	N.S.		1.89		4.58		13.17	
B within A	N.S.		3.28		7.94			
A within B			3.81		9.21			
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	39.42	3	40.84	2	40.07	1	40.11	3
VL 2041	39.14	5	40.04	5	39.93	3	39.70	5
VL 907 (C)	40.34	2	41.09	1	40.00	2	40.48	1
HS 562 (C)	39.28	4	40.48	3	39.70	4	39.82	4
HS 507 (C)	40.81	1	40.19	4	39.63	5	40.21	2
Mean	39.80		40.53		39.87		40.06	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.28		0.86		2.74	
Genotype (B)	N.S.		0.26		0.63		1.94	
B within A	N.S.		0.45		1.08			
A within B			0.49		1.19			
Date of Sowing:			01.11.2021					
Date of Harvesting:			29.04.2022					

Table 1.2.2 Northern Hill Zone			RIR-TS-TAS		Bajaura		2021-22	
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	44.13	3	45.42	5	48.31	4	45.95	5
VL 2041	42.63	4	49.25	1	51.67	2	47.85	1
VL 907 (C)	41.79	5	46.38	4	52.71	1	46.96	3
HS 562 (C)	47.29	1	46.63	3	46.21	5	46.71	4
HS 507 (C)	45.17	2	47.54	2	48.54	3	47.08	2
Mean	44.20		47.04		49.49		46.91	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.55		1.66		4.54	
Genotype (B)	N.S.		0.53		1.29		3.41	
B within A	**		0.92		2.23			
A within B			0.99		2.40			
<b>Earhead/sqm</b>								
HPW 349 (C)	321	5	340	5	384	2	348	5
VL 2041	323	4	363	4	401	1	362	2
VL 907 (C)	350	1	368	2	379	3	365	1
HS 562 (C)	344	2	366	3	366	5	358	4
HS 507 (C)	338	3	368	1	374	4	360	3
Mean	335		361		381		359	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		2.91		8.76		3.14	
Genotype (B)	N.S.		5.38		13.03		4.50	
B within A	N.S.		9.33		22.57			
A within B			8.83		21.37			
<b>Grains/Earhead</b>								
HPW 349 (C)	31.15	2	29.29	1	28.01	2	29.48	1
VL 2041	31.25	1	29.26	2	27.19	5	29.23	2
VL 907 (C)	28.02	5	27.11	5	28.87	1	28.00	5
HS 562 (C)	29.53	4	28.50	3	28.01	3	28.68	3
HS 507 (C)	29.63	3	28.40	4	27.89	4	28.64	4
Mean	29.91		28.51		27.99		28.81	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.46		1.39		6.19	
Genotype (B)	N.S.		0.56		1.36		5.84	
B within A	N.S.		0.97		2.35			
A within B			0.98		2.38			
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	44.15	3	45.59	3	44.98	5	44.90	5
VL 2041	42.38	5	46.37	2	47.46	2	45.40	4
VL 907 (C)	42.63	4	46.57	1	48.22	1	45.81	2
HS 562 (C)	46.68	1	44.89	5	45.17	4	45.58	3
HS 507 (C)	45.36	2	45.55	4	46.56	3	45.82	1
Mean	44.24		45.79		46.48		45.50	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.59		1.77		4.99	
Genotype (B)	N.S.		0.34		0.83		2.26	
B within A	**		0.59		1.44			
A within B			0.79		1.91			
Date of Sowing:	26.10.2021							
Date of Harvesting:								

Table 1.2.3. Northern Hill Zone			RIR-TS-TAS		Khudwani		2021-22	
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	53.30	2	61.31	3	66.31	4	60.33	3
VL 2041	34.53	5	58.91	4	66.43	3	53.29	4
VL 907 (C)	37.80	4	52.13	5	58.08	4	49.34	5
HS 562 (C)	65.21	1	68.62	1	68.48	2	67.44	1
HS 507 (C)	52.03	3	64.40	2	70.37	1	62.27	2
Mean	48.57		61.07		65.93		58.53	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		1.38		4.16		9.12	
Genotype (B)	**		1.00		2.41		5.11	
B within A			1.73		4.18			
A within B			2.07		5.01			
<b>Earhead/sqm</b>								
HPW 349 (C)	399	1	294	4	400	1	364	1
VL 2041	317	4	335	3	347	4	333	5
VL 907 (C)	354	3	347	1	341	5	347	2
HS 562 (C)	385	2	293	5	351	3	343	3
HS 507 (C)	310	5	339	2	356	2	335	4
Mean	353		322		359		345	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		7.96		24.01		8.95	
Genotype (B)	*		6.70		16.22		5.84	
B within A	**		11.61		28.10			
A within B			13.09		31.67			
<b>Grains/Earhead</b>								
HPW 349 (C)								
VL 2041								
VL 907 (C)								
HS 562 (C)								
HS 507 (C)								
Mean								
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)								
Genotype (B)								
B within A								
A within B								
<b>1000 Grains Weight, g</b>								
HPW 349 (C)								
VL 2041								
VL 907 (C)								
HS 562 (C)								
HS 507 (C)								
Mean								
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)								
Genotype (B)								
B within A								
A within B								
Date of Sowing:	20.10.2021							
Date of Harvesting:	14.06.2022							

Table 1.2.4. Northern Hill Zone			RIR-TS-TAS				Malan	2021-22
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield,q/ha</b>								
HPW 349 (C)	31.51	1	32.06	3	36.62	2	33.40	2
VL 2041	26.10	4	23.91	5	32.71	5	27.57	5
VL 907 (C)	24.38	5	27.17	4	34.81	4	28.78	4
HS 562 (C)	27.09	3	32.13	2	34.85	3	31.36	3
HS 507 (C)	30.97	2	36.40	1	39.85	1	35.74	1
Mean	28.01		30.33		35.77		31.37	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		1.34		4.04		16.53	
Genotype (B)	**		0.95		2.29		9.05	
B within A	N.S.		1.64		3.96			
A within B			1.98		4.80			
<b>Earhead/sqm</b>								
HPW 349 (C)	299	5	421	2	434	3	385	3
VL 2041	319	3	349	4	363	4	344	4
VL 907 (C)	314	4	319	5	335	5	322	5
HS 562 (C)	338	1	417	3	442	2	399	2
HS 507 (C)	324	2	422	1	469	1	405	1
Mean	318		386		409		371	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		7.18		21.64		7.49	
Genotype (B)	**		10.41		25.18		8.42	
B within A	*		18.02		43.61			
A within B			17.65		42.70			
<b>Grains/Earhead</b>								
HPW 349 (C)	24.65	1	18.97	3	19.50	5	21.04	3
VL 2041	21.72	3	17.17	5	22.36	3	20.42	4
VL 907 (C)	18.78	5	19.55	2	24.88	1	21.07	2
HS 562 (C)	20.64	4	18.57	4	20.02	4	19.74	5
HS 507 (C)	23.29	2	23.16	1	22.78	2	23.08	1
Mean	21.82		19.48		21.91		21.07	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.05		3.17		19.32	
Genotype (B)	N.S.		1.14		2.75		16.20	
B within A	N.S.		1.97		4.77			
A within B			2.05		4.96			
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	43.15	1	40.52	3	43.31	1	42.33	2
VL 2041	39.27	4	39.89	4	40.41	3	39.86	4
VL 907 (C)	41.38	3	43.84	2	42.29	2	42.51	1
HS 562 (C)	38.87	5	44.40	1	39.74	4	41.01	3
HS 507 (C)	42.59	2	37.64	5	37.38	5	39.20	5
Mean	41.05		41.26		40.63		40.98	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.79		2.38		7.46	
Genotype (B)	N.S.		1.53		3.70		11.19	
B within A	N.S.		2.65		6.41			
A within B			2.50		6.04			
Date of Sowing:	11.11.2021							
Date of Harvesting:	30.04.2022							

Table 1.2.5. Northern Hill Zone			RIR-TS-TAS		Shimla		2021-22	
Genotype	Irrigation level						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HPW 349 (C)	25.33	3	27.44	3	35.54	2	29.44	3
VL 2041	22.25	5	23.89	5	24.56	5	23.56	5
VL 907 (C)	29.07	2	30.37	2	31.32	3	30.25	2
HS 562 (C)	29.37	1	36.34	1	40.62	1	35.44	1
HS 507 (C)	24.59	4	25.09	4	27.38	4	25.69	4
Mean	26.12		28.63		31.88		28.88	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.67		2.02		9.00	
Genotype (B)	**		0.75		1.81		7.75	
B within A	**		1.29		3.13			
A within B			1.34		3.23			
<b>Earhead/sqm</b>								
HPW 349 (C)	308	1	312	1	324	1	315	1
VL 2041	241	5	245	5	259	5	248	5
VL 907 (C)	251	4	294	3	292	3	279	3
HS 562 (C)	274	2	296	2	310	2	293	2
HS 507 (C)	265	3	278	4	285	4	276	4
Mean	268		285		294		282	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		4.15		12.50		5.69	
Genotype (B)	**		6.74		16.31		7.16	
B within A	N.S.		11.67		28.24			
A within B			11.23		27.18			
<b>Grains/Earhead</b>								
HPW 349 (C)	19.61	5	20.34	5	25.32	2	21.76	3
VL 2041	20.48	4	21.83	3	20.99	5	21.10	5
VL 907 (C)	25.66	1	23.04	2	24.80	3	24.50	2
HS 562 (C)	24.23	2	26.59	1	29.43	1	26.75	1
HS 507 (C)	21.82	3	21.04	4	21.87	4	21.58	4
Mean	22.36		22.57		24.48		23.14	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.50		1.51		8.36	
Genotype (B)	**		0.73		1.77		9.50	
B within A	N.S.		1.27		3.07			
A within B			1.24		3.00			
<b>1000 Grains Weight, g</b>								
HPW 349 (C)	42.00	5	43.33	4	43.33	4	42.89	5
VL 2041	45.33	1	44.67	3	45.33	1	45.11	2
VL 907 (C)	45.33	1	45.00	2	43.33	4	44.56	3
HS 562 (C)	44.67	3	46.33	1	44.67	2	45.22	1
HS 507 (C)	42.67	4	43.00	5	44.00	3	43.22	4
Mean	44.00		44.47		44.13		44.20	
	F Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.30		0.90		2.61	
Genotype (B)	*		0.64		1.56		4.37	
B within A	N.S.		1.11		2.70			
A within B			1.04		2.52			
Date of Sowing:	25.10.2021							
Date of Harvesting:	10.05.2022							

Table 2.2.1.	North Western Plain Zone		IR-DOS-TAS		Delhi	2021-22
	Date of Sowing					
Genotype	Timely	Rk	Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HD 3406	48.55	6	34.62	4	41.58	5
PBW 826	50.57	3	38.80	1	44.68	1
HD 2967 (c)	49.08	5	31.98	6	40.53	6
DBW 187 (c)	51.45	2	35.72	3	43.58	3
HD 3086 (c)	53.32	1	32.18	5	42.75	4
DBW 222 (c)	50.45	4	37.17	2	43.81	2
Mean	50.57		35.08		42.82	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.33	1.34	3.22	
Genotype (B)	**		0.33	0.81	1.89	
B within A	**		0.47	1.14		
A within B			0.54	1.31		
<b>Earhead/sq.m.</b>						
HD 3406	492	1	418	3	455	1
PBW 826	439	5	393	4	416	4
HD 2967 (c)	456	4	425	2	441	3
DBW 187 (c)	467	2	358	5	413	5
HD 3086 (c)	462	3	439	1	450	2
DBW 222 (c)	399	6	349	6	374	6
Mean	452		397		425	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		12.69	52.41	12.68	
Genotype (B)	*		18.34	44.74	10.58	
B within A	N.S.		25.94	63.27		
A within B			26.86	65.53		
<b>1000 grains weight, g</b>						
HD 3406	38.27	4	33.07	4	35.67	4
PBW 826	40.19	1	34.98	1	37.59	1
HD 2967 (c)	38.52	3	33.84	3	36.18	3
DBW 187 (c)	39.44	2	34.78	2	37.11	2
HD 3086 (c)	37.20	6	31.94	6	34.57	6
DBW 222 (c)	37.32	5	32.15	5	34.74	5
Mean	38.49		33.46		35.98	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.32	1.33	3.79	
Genotype (B)	**		0.09	0.21	0.59	
B within A	*		0.12	0.30		
A within B			0.34	0.83		
<b>Grains/earhead</b>						
HD 3406	25.85	6	25.07	4	25.46	6
PBW 826	28.71	3	28.27	3	28.49	3
HD 2967 (c)	28.08	5	23.33	6	25.70	5
DBW 187 (c)	28.08	4	29.07	2	28.57	2
HD 3086 (c)	31.40	2	23.46	5	27.43	4
DBW 222 (c)	33.94	1	34.93	1	34.43	1
Mean	29.34		27.35		28.35	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		1.25	5.17	18.74	
Genotype (B)	**		1.25	3.04	10.76	
B within A	N.S.		1.76	4.30		
A within B			2.04	4.97		
Date of Sowing:	11.11.2021	13.12.2021	Date of Harvesting:	08.04.2022	15.04.2022	

Genotype	North Western Plain Zone		IR-DOS-TAS		Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HD 3406	56.06	5	59.99	3	58.03	3
PBW 826	64.30	1	62.33	1	63.32	1
HD 2967 (c)	54.13	6	56.44	5	55.28	5
DBW 187 (c)	57.34	4	57.92	4	57.63	4
HD 3086 (c)	57.68	3	51.77	6	54.72	6
DBW 222 (c)	63.88	2	61.36	2	62.62	2
Mean	58.90		58.30		58.60	
<b>Earhead/sq.m.</b>						
HD 3406	370	3	346	5	358	3
PBW 826	419	1	347	4	383	1
HD 2967 (c)	366	4	328	6	347	5
DBW 187 (c)	353	5	348	3	350	4
HD 3086 (c)	332	6	349	2	340	6
DBW 222 (c)	381	2	366	1	374	2
Mean	370		347		359	
<b>1000 grains weight, g</b>						
HD 3406	37.45	5	36.56	6	37.01	6
PBW 826	40.24	2	40.49	1	40.37	1
HD 2967 (c)	38.99	4	39.21	3	39.10	3
DBW 187 (c)	40.81	1	38.69	4	39.75	2
HD 3086 (c)	39.07	3	37.33	5	38.20	4
DBW 222 (c)	35.40	6	39.40	2	37.40	5
Mean	38.66		38.61		38.64	
<b>Grains/earhead</b>						
HD 3406	40.50	3	47.52	1	44.01	2
PBW 826	38.28	5	45.16	2	41.72	4
HD 2967 (c)	37.99	6	44.59	3	41.29	6
DBW 187 (c)	39.79	4	43.15	4	41.47	5
HD 3086 (c)	44.76	2	39.70	6	42.23	3
DBW 222 (c)	47.40	1	42.62	5	45.01	1
Mean	41.45		43.79		42.62	
<b>Date of Sowing: 06.11.2021 10.12.2021 Date of Harvesting: 20.04.2022 02.05.2022</b>						



Table 2.2.3	North Western Plain Zone		IR-DOS-TAS		Gwalior	2021-22
	Date of Sowing					
Genotype	Timely	Rk	Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HD 3406	43.25	6	38.86	6	41.06	6
PBW 826	54.76	1	51.53	1	53.15	1
HD 2967 (c)	46.43	5	40.33	5	43.38	5
DBW 187 (c)	52.38	3	41.71	3	47.04	3
HD 3086 (c)	49.21	4	41.17	4	45.19	4
DBW 222 (c)	54.09	2	48.23	2	51.16	2
Mean	50.02		43.64		46.83	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		0.68	2.83	6.21	
Genotype (B)	**		1.08	2.63	5.64	
B within A	N.S.		1.53	3.72		
A within B			1.55	3.79		
<b>Earhead/sq.m.</b>						
HD 3406	375	6	354	5	365	5
PBW 826	435	1	407	1	421	1
HD 2967 (c)	406	3	365	2	386	2
DBW 187 (c)	389	4	365	2	377	4
HD 3086 (c)	388	5	337	6	363	6
DBW 222 (c)	408	2	358	4	383	3
Mean	400		364		382	
		F. Test	SEm	CD (0.05)	CV (%)	
Sowing (A)	(A)	**	1.81	7.49	2.01	
Genotype (B)	(B)	**	4.42	10.79	2.83	
B within A		N.S.	6.26	15.26		
A within B			5.99	14.62		
<b>1000 grains weight, g</b>						
HD 3406	35.07	5	26.15	6	30.61	5
PBW 826	47.96	1	40.57	1	44.27	1
HD 2967 (c)	32.14	6	27.91	5	30.02	6
DBW 187 (c)	45.14	2	34.14	2	39.64	2
HD 3086 (c)	42.26	3	33.60	3	37.93	3
DBW 222 (c)	38.94	4	31.35	4	35.15	4
Mean	40.25		32.29		36.27	
		F. Test	SEm	CD (0.05)	CV (%)	
Sowing (A)		**	0.46	1.90	5.40	
Genotype (B)		**	0.60	1.46	4.04	
B within A		*	0.85	2.07		
A within B			0.90	2.20		
<b>Grains/earhead</b>						
HD 3406	32.90	3	42.14	2	37.52	3
PBW 826	26.37	6	31.24	6	28.80	6
HD 2967 (c)	35.67	1	39.59	3	37.63	2
DBW 187 (c)	29.87	5	33.67	5	31.77	5
HD 3086 (c)	30.03	4	36.36	4	33.20	4
DBW 222 (c)	34.09	2	42.89	1	38.49	1
Mean	31.49		37.65		34.57	
		F. Test	SEm	CD (0.05)	CV (%)	
Sowing (A)		**	0.16	0.65	1.95	
Genotype (B)		**	1.09	2.67	7.75	
B within A		N.S.	1.55	3.77		
A within B			1.42	3.47		
Date of Sowing:	10.11.2021	14.12.2021	Date of Harvesting:	10.04.2022	12.04.2022	

Table 2.2.4	North Western Plain Zone		IR-DOS-TAS		Hisar	2021-22
	Date of Sowing					
Genotype	Timely	Rk	Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HD 3406	61.35	1	43.89	4	52.62	4
PBW 826	59.37	3	46.31	2	52.84	2
HD 2967 (c)	50.08	5	39.52	5	44.80	5
DBW 187 (c)	59.01	4	46.94	1	52.98	1
HD 3086 (c)	46.90	6	39.09	6	43.00	6
DBW 222 (c)	60.00	2	45.44	3	52.72	3
Mean	56.12		43.53		49.82	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.71	2.94	6.05	
Genotype (B)	**		0.93	2.28	4.59	
B within A	*		1.32	3.22		
A within B			1.40	3.42		
<b>Earhead/sq.m.</b>						
HD 3406	440	2	387	4	413	4
PBW 826	432	4	409	3	421	3
HD 2967 (c)	415	5	362	6	388	6
DBW 187 (c)	435	3	415	1	425	2
HD 3086 (c)	415	5	368	5	392	5
DBW 222 (c)	443	1	411	2	427	1
Mean	430		392		411	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		4.46	18.42	4.60	
Genotype (B)	*		9.76	23.80	5.81	
B within A	N.S.		13.80	33.65		
A within B			13.36	32.59		
<b>1000 grains weight, g</b>						
HD 3406	36.68	3	30.26	5	33.47	4
PBW 826	41.83	1	38.34	1	40.08	1
HD 2967 (c)	33.36	6	30.98	4	32.17	6
DBW 187 (c)	37.71	2	36.65	2	37.18	2
HD 3086 (c)	35.87	4	28.74	6	32.31	5
DBW 222 (c)	35.32	5	32.21	3	33.76	3
Mean	36.79		32.86		34.83	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		0.32	1.34	3.95	
Genotype (B)	**		0.55	1.35	3.90	
B within A	**		0.78	1.91		
A within B			0.79	1.92		
Date of Sowing:	10.11.2021	13.12.2021	Date of Harvesting:	14.04.2022	19.04.2022	
<b>Grains/earhead</b>						
HD 3406	38.03	2	37.65	1	37.84	1
PBW 826	33.03	5	29.55	6	31.29	6
HD 2967 (c)	36.32	3	35.71	3	36.02	3
DBW 187 (c)	35.98	4	30.94	5	33.46	5
HD 3086 (c)	31.60	6	37.05	2	34.33	4
DBW 222 (c)	38.41	1	34.39	4	36.40	2
Mean	35.56		34.22		34.89	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		0.83	3.41	10.04	
Genotype (B)	**		1.14	2.78	7.99	
B within A	*		1.61	3.93		
A within B			1.68	4.11		
Date of Sowing:	10.11.2021	13.12.2021	Date of Harvesting:	14.04.2022	19.04.2022	

Table 2.2.5	North Western Plain Zone		IR-DOS-TAS		Jammu	2021-22
	Date of Sowing					
Genotype	Timely	Rk	Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HD 3406	58.02	1	40.62	6	49.32	2
PBW 826	57.83	2	44.22	2	51.03	1
HD 2967 (c)	51.87	5	45.41	1	48.64	3
DBW 187 (c)	53.20	4	43.14	3	48.17	5
HD 3086 (c)	50.54	6	40.64	5	45.59	6
DBW 222 (c)	55.00	3	41.39	4	48.20	4
Mean	54.41		42.57		48.49	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.29	1.21	2.56	
Genotype (B)	N.S.		1.23	3.01	6.23	
B within A	N.S.		1.74	4.25		
A within B			1.62	3.95		
<b>Earhead/sq.m.</b>						
HD 3406	393	1	435	3	414	2
PBW 826	372	5	433	4	403	4
HD 2967 (c)	382	2	436	2	409	3
DBW 187 (c)	354	6	392	6	373	6
HD 3086 (c)	379	4	423	5	401	5
DBW 222 (c)	382	3	466	1	424	1
Mean	377		431		404	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		5.35	22.10	5.62	
Genotype (B)	*		9.00	21.96	5.46	
B within A	N.S.		12.73	31.06		
A within B			12.80	31.21		
<b>1000 grains weight, g</b>						
HD 3406	39.08	1	34.35	6	36.72	5
PBW 826	38.15	2	35.60	5	36.88	4
HD 2967 (c)	36.95	5	36.98	1	36.97	2
DBW 187 (c)	37.28	4	36.48	2	36.88	3
HD 3086 (c)	36.23	6	36.38	3	36.31	6
DBW 222 (c)	38.00	3	35.97	4	36.98	1
Mean	37.62		35.96		36.79	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		0.42	1.72	4.80	
Genotype (B)	N.S.		0.54	1.31	3.57	
B within A	*		0.76	1.85		
A within B			0.81	1.97		
<b>Grains/earhead</b>						
HD 3406	37.94	4	27.35	4	32.65	4
PBW 826	40.94	1	28.69	2	34.81	2
HD 2967 (c)	37.32	5	28.18	3	32.75	3
DBW 187 (c)	40.44	2	30.22	1	35.33	1
HD 3086 (c)	36.87	6	26.43	5	31.65	5
DBW 222 (c)	38.05	3	24.71	6	31.38	6
Mean	38.59		27.60		33.09	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.15	0.63	1.95	
Genotype (B)	N.S.		1.45	3.53	10.71	
B within A	N.S.		2.05	4.99		
A within B			1.87	4.57		
Date of Sowing:	11.11.2021	11.12.2021	Date of Harvesting:			

Genotype	Date of Sowing		IR-DOS-TAS		Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HD 3406	38.67	5	26.50	5	32.98	5
PBW 826	61.20	1	40.10	2	50.65	1
HD 2967 (c)	31.10	6	22.63	6	26.87	6
DBW 187 (c)	50.20	4	38.70	4	44.45	4
HD 3086 (c)	50.37	3	38.77	3	44.57	3
DBW 222 (c)	57.77	2	42.50	1	50.13	2
Mean	48.22		34.87		41.54	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		2.42	9.98	24.67	
Genotype (B)	*		1.08	2.64	6.39	
B within A	*		1.53	3.74		
A within B	*		2.79	6.81		
<b>Earhead/sq.m.</b>						
HD 3406	460	5	455	1	457	2
PBW 826	475	2	428	3	452	3
HD 2967 (c)	430	6	407	6	419	6
DBW 187 (c)	473	4	421	5	447	5
HD 3086 (c)	475	2	446	2	461	1
DBW 222 (c)	478	1	423	4	450	4
Mean	465		430		448	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		5.94	24.53	5.63	
Genotype (B)	*		9.22	22.50	5.05	
B within A	N.S.		13.04	31.81		
A within B			13.30	32.46		
<b>1000 grains weight, g</b>						
HD 3406	31.00	5	22.60	5	26.80	5
PBW 826	48.67	1	33.70	1	41.18	1
HD 2967 (c)	28.87	6	21.77	6	25.32	6
DBW 187 (c)	46.63	2	26.80	3	36.72	2
HD 3086 (c)	43.17	3	26.27	4	34.72	3
DBW 222 (c)	38.97	4	29.67	2	34.32	4
Mean	39.55		26.80		33.18	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		1.08	4.47	13.86	
Genotype (B)	**		0.80	1.95	5.90	
B within A	**		1.13	2.76		
A within B			1.50	3.65		
<b>Grains/earhead</b>						
HD 3406	27.17	2	25.66	5	26.42	5
PBW 826	26.51	3	27.68	4	27.10	4
HD 2967 (c)	25.00	4	25.47	6	25.23	6
DBW 187 (c)	22.80	6	34.44	1	28.62	3
HD 3086 (c)	24.55	5	33.17	3	28.86	2
DBW 222 (c)	31.07	1	33.92	2	32.50	1
Mean	26.18		30.06		28.12	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	*		0.50	2.07	7.56	
Genotype (B)	**		0.90	2.20	7.85	
B within A	**		1.27	3.11		
A within B			1.27	3.09		
Date of Sowing:	06.11.2021	14.12.2021	Date of Harvesting:	13.04.2022	19.04.2022	

Table 2.2.7	North Western Plain Zone		IR-DOS-TAS		Ludhiana		2021-22		
	Date of Sowing				Mean	Rk			
Genotype	Timely	Rk	Late	Rk					
<b>Yield, q/ha</b>									
HD 3406	50.63	6	46.07	3	48.35	4			
PBW 826	60.35	1	48.23	2	54.29	1			
HD 2967 (c)	54.66	3	48.55	1	51.61	2			
DBW 187 (c)	53.65	4	42.84	4	48.24	5			
HD 3086 (c)	52.68	5	42.06	5	47.37	6			
DBW 222 (c)	56.61	2	41.02	6	48.81	3			
Mean	54.76		44.79		49.78				
<b>Statistical Analysis</b>									
	F. Test		SEm	CD (0.05)	CV (%)				
Sowing (A)	**		0.24	1.00	2.07				
Genotype (B)	**		0.94	2.29	4.62				
B within A	**		1.33	3.24					
A within B			1.24	3.01					
<b>Earhead/sq.m.</b>									
HD 3406	274	2	265	2	270	1			
PBW 826	274	2	260	3	267	2			
HD 2967 (c)	272	4	259	4	265	4			
DBW 187 (c)	267	6	258	5	263	5			
HD 3086 (c)	268	5	266	1	267	2			
DBW 222 (c)	283	1	234	6	258	6			
Mean	273		257		265				
<b>Statistical Analysis</b>									
	F. Test		SEm	CD (0.05)	CV (%)				
Sowing (A)	*		1.66	6.87	2.66				
Genotype (B)	N.S.		2.73	6.66	2.53				
B within A	**		3.86	9.42					
A within B			3.90	9.51					
<b>1000 grains weight, g</b>									
HD 3406	33.33	3	30.67	4	32.00	4			
PBW 826	39.00	1	33.67	2	36.33	1			
HD 2967 (c)	31.67	6	29.33	6	30.50	6			
DBW 187 (c)	38.00	2	34.00	1	36.00	2			
HD 3086 (c)	32.33	5	29.67	5	31.00	5			
DBW 222 (c)	33.00	4	31.67	3	32.33	3			
Mean	34.56		31.50		33.03				
<b>Statistical Analysis</b>									
	F. Test		SEm	CD (0.05)	CV (%)				
Sowing (A)	*		0.35	1.44	4.49				
Variety (B)	**		0.69	1.69	5.14				
B within A	N.S.		0.98	2.39					
A within B			0.96	2.34					
<b>Grains/earhead</b>									
HD 3406	55.43	5	56.97	2	56.20	4			
PBW 826	56.65	4	55.25	4	55.95	5			
HD 2967 (c)	63.65	1	63.92	1	63.78	1			
DBW 187 (c)	52.84	6	48.94	6	50.89	6			
HD 3086 (c)	60.80	2	53.58	5	57.19	3			
DBW 222 (c)	60.70	3	55.37	3	58.04	2			
Mean	58.34		55.67		57.01				
<b>Statistical Analysis</b>									
	F. Test		SEm	CD (0.05)	CV (%)				
Sowing (A)	*		0.42	1.72	3.10				
Genotype (B)	**		1.49	3.62	6.38				
B within A	N.S.		2.10	5.13					
A within B			1.96	4.79					
Date of Sowing:	06.11.2021	09.12.2021	Date of Harvesting:	21.04.2022	21.04.2022				

Genotype	North Western Plain Zone		IR-DOS-TAS		Pantnagar		2021-22
	Date of Sowing						
	Timely	Rk	Late	Rk	Mean	Rk	
<b>Yield, q/ha</b>							
HD 3406	53.18	2	35.09	4	41.14	2	
PBW 826	49.62	4	37.06	2	43.34	3	
HD 2967 (c)	50.48	3	35.81	3	43.15	4	
DBW 187 (c)	41.56	6	34.58	5	38.07	5	
HD 3086 (c)	42.11	5	33.16	6	37.95	6	
DBW 222 (c)	54.76	1	42.97	1	48.87	1	
Mean	48.62		36.55		42.59		
F. Test			SEm	CD (0.05)	CV (%)		
Sowing (A)	**		0.60	2.47	5.95		
Genotype (B)			1.78	4.35	10.26		
B within A	N.S.		2.52	6.16			
A within B			2.38	5.81			
<b>Earhead/sq.m.</b>							
HD 3406	433	1	405	2	419	1	
PBW 826	386	4	328	6	357	6	
HD 2967 (c)	419	2	401	3	410	2	
DBW 187 (c)	359	6	441	1	400	3	
HD 3086 (c)	393	3	356	5	375	4	
DBW 222 (c)	366	5	358	4	362	5	
Mean	393		381		387		
F. Test			SEm	CD (0.05)	CV (%)		
Sowing (A)	N.S.		10.47	43.23	11.47		
Genotype (B)	**		9.76	23.80	6.17		
B within A	**		13.80	33.66			
A within B			16.38	39.95			
<b>1000 grains weight, g</b>							
HD 3406	41.15	5	27.37	4	34.26	5	
PBW 826	53.29	2	33.69	2	43.49	2	
HD 2967 (c)	38.02	6	25.89	5	31.95	6	
DBW 187 (c)	54.14	1	35.81	1	44.97	1	
HD 3086 (c)	49.95	3	25.76	6	37.85	4	
DBW 222 (c)	45.12	4	31.16	3	38.14	3	
Mean	46.94		29.95		38.45		
F. Test			SEm	CD (0.05)	CV (%)		
Sowing (A)	**		0.63	2.61	6.97		
Genotype (B)	**		1.11	2.71	7.07		
B within A	**		1.57	3.83			
A within B			1.57	3.82			
<b>Grains/earhead</b>							
HD 3406	29.90	3	31.66	5	30.78	3	
PBW 826	24.56	4	33.98	4	29.27	5	
HD 2967 (c)	31.76	2	35.08	3	33.42	2	
DBW 187 (c)	21.65	5	21.92	6	21.78	6	
HD 3086 (c)	21.34	6	37.36	2	29.35	4	
DBW 222 (c)	33.30	1	38.93	1	36.12	1	
Mean	27.08		33.16		30.12		
F. Test			SEm	CD (0.05)	CV (%)		
Sowing (A)	*		0.81	3.34	11.39		
Genotype (B)	**		1.62	3.95	13.17		
B within A	*		2.29	5.59			
A within B			2.24	5.47			
Date of Sowing:	05.11.2021	13.12.2021	Date of Harvesting:	06.04.2022	18.04.2022		

Genotype	Date of Sowing		Late	Rk	Mean	Rk
	Timely	Rk				
<b>Yield, q/ha</b>						
HD 3406	68.25	4	38.75	6	53.50	6
PBW 826	74.95	1	41.62	4	58.29	1
HD 2967 (c)	74.61	2	41.81	3	58.21	2
DBW 187 (c)	65.47	5	42.38	2	53.93	5
HD 3086 (c)	64.35	6	45.93	1	55.14	4
DBW 222 (c)	73.65	3	41.41	5	57.53	3
Mean	70.22		41.98		56.10	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.14	0.57	1.05	
Genotype (B)	*		1.13	2.75	4.93	
B within A	**		1.60	3.89		
A within B			1.46	3.57		
<b>Earhead/sq.m.</b>						
HD 3406	398	2	327	1	363	1
PBW 826	400	1	290	5	345	4
HD 2967 (c)	394	4	310	3	352	2
DBW 187 (c)	388	5	266	6	327	6
HD 3086 (c)	373	6	315	2	344	5
DBW 222 (c)	398	3	304	4	351	3
Mean	392		302		347	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.54	2.22	0.66	
Genotype (B)	**		4.73	11.55	3.34	
B within A	**		6.70	16.33		
A within B			6.14	14.97		
<b>1000 grains weight, g</b>						
HD 3406	44.96	1	33.14	5	39.05	1
PBW 826	40.67	5	34.21	1	37.44	4
HD 2967 (c)	39.83	6	33.27	3	36.55	6
DBW 187 (c)	41.99	3	33.18	4	37.59	3
HD 3086 (c)	44.77	2	32.96	6	38.86	2
DBW 222 (c)	41.35	4	33.41	2	37.38	5
Mean	42.26		33.36		37.81	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	**		0.15	0.61	1.65	
Genotype (B)	**		0.28	0.68	1.80	
B within A	**		0.39	0.96		
A within B			0.39	0.95		
<b>Grains/earhead</b>						
HD 3406	38.16	6	35.74	6	36.95	6
PBW 826	46.11	2	42.01	3	44.06	3
HD 2967 (c)	47.58	1	40.54	5	44.06	2
DBW 187 (c)	40.22	4	48.07	1	44.15	1
HD 3086 (c)	38.57	5	44.30	2	41.43	5
DBW 222 (c)	44.85	3	40.81	4	42.83	4
Mean	42.58		41.91		42.25	
	F. Test		SEm	CD (0.05)	CV (%)	
Sowing (A)	N.S.		0.25	1.01	2.46	
Genotype (B)	**		1.16	2.82	6.71	
B within A	**		1.64	3.99		
A within B			1.51	3.69		
Date of Sowing:	05.11.2021	10.12.2021	Date of Harvesting:	11.04.2022	15.04.2022	

Table 2.4.1 North Western Plain Zone		RIR-TS-TAS		Delhi		2021-22		
Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HI1654	37.65	1	40.37	1	41.93	1	39.98	1
HI1653	36.60	2	39.34	2	40.28	2	38.74	2
HD3043 (c)	32.72	7	36.87	5	38.28	5	35.96	6
NIAW3170 (c)	31.93	8	35.05	9	37.28	8	34.76	8
HD3369	31.00	9	35.27	8	36.83	9	34.37	9
DBW296 (c)	34.08	4	36.43	6	37.92	6	36.14	5
PBW644 (c)	32.74	6	35.72	7	37.45	7	35.30	7
HI1628 (c)	33.57	5	37.07	4	38.70	4	36.44	4
HUW838 (c)	34.93	3	38.02	3	39.25	3	37.40	3
Mean	33.91		37.12		38.66		36.57	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.36		1.07		5.06	
Genotype (B)	**		0.33		0.79		2.74	
B within A	N.S.		0.58		1.37			
A within B			0.65		1.54			
<b>Earhead/sq.m.</b>								
HI1654	435	2	489	1	547	1	490	1
HI1653	291	9	335	9	383	8	336	8
HD3043 (c)	399	3	425	3	470	3	431	3
NIAW3170 (c)	436	1	483	2	534	2	484	2
HD3369	319	7	350	7	408	7	359	7
DBW296 (c)	385	5	412	5	457	5	418	5
PBW644 (c)	331	6	370	6	413	6	371	6
HI1628 (c)	309	8	342	8	355	9	335	9
HUW838 (c)	387	4	422	4	464	4	424	4
Mean	366		403		448		406	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		13.94		42.04		17.86	
Genotype (B)	**		14.69		34.83		10.86	
B within A	N.S.		25.44		60.33			
A within B			27.74		65.79			
<b>1000 grains weight, g</b>								
HI1654	38.30	6	39.33	5	40.77	4	39.47	4
HI1653	39.87	2	40.63	1	41.63	1	40.71	1
HD3043 (c)	36.67	9	37.82	9	38.69	9	37.72	9
NIAW3170 (c)	39.60	3	40.61	2	40.94	2	40.38	3
HD3369	38.31	5	39.29	6	40.26	6	39.29	6
DBW296 (c)	37.75	7	38.69	7	39.64	8	38.69	7
PBW644 (c)	38.45	4	39.41	4	40.41	5	39.42	5
HI1628 (c)	40.12	1	40.28	3	40.81	3	40.40	2
HUW838 (c)	37.69	8	38.61	8	39.69	7	38.66	8
Mean	38.53		39.41		40.32		39.42	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.10		0.29		1.26	
Genotype (B)	**		0.12		0.30		0.95	
B within A	N.S.		0.22		0.51			
A within B			0.23		0.53			



Grains/earhead								
HI1654	22.90	7	21.08	8	18.81	8	20.93	8
HI1653	31.95	1	29.06	1	25.56	2	28.86	1
HD3043 (c)	22.77	8	22.99	7	21.07	6	22.28	7
NIAW3170 (c)	18.48	9	18.03	9	17.22	9	17.91	9
HD3369	26.75	3	26.51	3	22.62	3	25.29	3
DBW296 (c)	23.89	6	23.19	6	20.97	7	22.68	6
PBW644 (c)	26.70	4	25.10	4	22.56	4	24.79	4
HI1628 (c)	29.59	2	28.52	2	27.94	1	28.68	2
HUW838 (c)	24.32	5	23.66	5	21.35	5	23.11	5
Mean	25.26		24.24		22.01		23.84	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.08		3.25		23.53	
Genotype (B)	**		0.89		2.10		11.14	
B within A	N.S.		1.53		3.64			
A within B			1.80		4.28			
Date of Sowing:	30.11.2021		Date of Harvesting:				22.03.2022	

Table 2.4.2 North Western Plain Zone		RIR-TS-TAS		Gurdaspur		2021-22		
Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
Yield, q/ha								
HI1654	56.59	1	57.53	5	61.56	2	58.56	2
HI1653	51.73	6	55.74	7	58.86	4	55.44	7
HD3043 (c)	51.60	7	54.62	8	61.47	3	55.90	6
NIAW3170 (c)	52.32	5	53.61	9	57.87	7	54.60	9
HD3369	54.26	4	59.34	4	58.23	5	57.28	3
DBW296 (c)	55.50	3	56.06	6	57.95	6	56.50	5
PBW644 (c)	55.70	2	61.57	2	53.54	9	56.94	4
HI1628 (c)	49.84	9	59.61	3	55.84	8	55.09	8
HUW838 (c)	51.55	8	63.33	1	62.79	1	59.22	1
Mean	53.23		57.94		58.68		56.62	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.82		2.46		7.50	
Genotype (B)	**		0.93		2.21		4.93	
B within A	**		1.61		3.82			
A within B			1.73		4.09			
Earhead/sq.m.								
HI1654	347	3	355	5	373	3	358	3
HI1653	341	6	332	9	306	9	326	9
HD3043 (c)	345	5	338	8	406	1	363	1
NIAW3170 (c)	346	4	347	6	357	4	350	4
HD3369	359	2	359	4	329	6	349	5
DBW296 (c)	318	8	365	2	352	5	345	6
PBW644 (c)	303	9	361	3	329	6	331	8
HI1628 (c)	337	7	371	1	323	8	344	7
HUW838 (c)	364	1	342	7	377	2	361	2
Mean	340		352		350		347	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		2.29		6.90		3.42	
Genotype (B)	**		4.71		11.16		4.06	
B within A	**		8.15		19.33			
A within B			8.02		19.02			

1000 grains weight, g								
HI1654	35.81	6	37.90	7	37.70	8	37.13	7
HI1653	41.20	1	40.10	1	41.67	1	40.99	1
HD3043 (c)	34.21	9	35.03	9	36.75	9	35.33	9
NIAW3170 (c)	37.98	2	39.47	3	40.18	2	39.21	2
HD3369	37.07	4	39.15	4	39.65	4	38.62	4
DBW296 (c)	34.99	7	38.61	6	39.75	3	37.78	6
PBW644 (c)	37.69	3	37.75	8	39.62	5	38.35	5
HI1628 (c)	36.79	5	39.73	2	39.56	6	38.69	3
HUW838 (c)	34.23	8	38.98	5	38.10	7	37.10	8
Mean	36.66		38.52		39.22		38.14	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.40		1.21		5.45	
Genotype (B)	**		0.67		1.59		5.29	
B within A	N.S.		1.16		2.76			
A within B			1.17		2.77			
Grains/earhead								
HI1654	45.51	3	42.92	4	44.01	4	44.15	3
HI1653	37.00	9	41.83	6	46.28	1	41.70	7
HD3043 (c)	44.00	4	46.27	2	41.30	8	43.86	4
NIAW3170 (c)	39.96	8	39.27	9	40.42	9	39.88	9
HD3369	40.80	6	42.31	5	44.59	2	42.57	6
DBW296 (c)	50.12	1	39.79	8	41.44	6	43.78	5
PBW644 (c)	49.05	2	45.22	3	41.34	7	45.21	1
HI1628 (c)	40.17	7	40.39	7	43.76	5	41.44	8
HUW838 (c)	41.90	5	47.58	1	44.02	3	44.50	2
Mean	43.17		42.84		43.02		43.01	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.88		2.65		10.60	
Genotype (B)	*		1.08		2.56		7.54	
B within A	**		1.87		4.44			
A within B			1.97		4.67			
Date of Sowing:	02.11.2021		Date of Harvesting:				25.04.2022	

Table 2.4.3 North Western Plain Zone		RIR-TS-TAS		Gwalior		2021-22		
Genotype	Level of Irrigation				Mean	Rk		
	Zero	Rk	One	Rk				Two
Yield, q/ha								
HI1654	41.37	1	42.82	2	47.96	1	44.05	1
HI1653	36.05	4	37.09	7	38.74	9	37.29	8
HD3043 (c)	34.83	6	36.26	8	43.59	4	38.23	4
NIAW3170 (c)	35.10	5	38.21	4	39.73	8	37.68	6
HD3369	38.78	2	41.13	3	45.51	2	41.80	3
DBW296 (c)	33.98	7	38.10	6	40.14	7	37.40	7
PBW644 (c)	32.99	8	38.10	5	42.64	5	37.91	5
HI1628 (c)	31.29	9	34.35	9	41.18	6	35.61	9
HUW838 (c)	38.27	3	43.82	1	44.75	3	42.28	2
Mean	35.85		38.88		42.69		39.14	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.55		1.66		7.29	
Genotype (B)	**		0.75		1.77		5.72	
B within A	N.S.		1.29		3.06			
A within B			1.34		3.17			

Earhead/sq.m.								
HI1654	365	1	369	2	378	2	371	1
HI1653	330	7	328	7	346	8	335	8
HD3043 (c)	341	3	355	4	375	3	357	4
NIAW3170 (c)	345	2	340	6	342	9	342	6
HD3369	320	8	350	5	365	5	345	5
DBW296 (c)	310	9	320	8	350	7	327	9
PBW644 (c)	340	4	362	3	372	4	358	3
HI1628 (c)	335	6	320	8	365	5	340	7
HUW838 (c)	340	4	370	1	380	1	363	2
Mean	336		346		364		349	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		2.23		6.73		3.33	
Genotype (B)	**		2.89		6.86		2.49	
B within A	**		5.01		11.88			
A within B			5.22		12.39			
1000 grains weight, g								
HI1654	39.20	2	41.00	2	43.00	2	41.07	2
HI1653	39.00	3	40.00	4	41.00	4	40.00	3
HD3043 (c)	34.00	9	35.00	9	38.00	9	35.67	9
NIAW3170 (c)	35.00	6	39.00	6	41.00	4	38.33	6
HD3369	40.00	1	42.67	1	46.30	1	42.99	1
DBW296 (c)	37.00	5	40.04	3	41.00	6	39.35	5
PBW644 (c)	34.91	7	36.64	8	39.67	8	37.07	8
HI1628 (c)	34.00	8	37.62	7	42.00	3	37.87	7
HUW838 (c)	38.00	4	40.00	4	41.00	6	39.67	4
Mean	36.79		39.11		41.44		39.11	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.29		0.88		3.86	
Genotype (B)	**		0.48		1.14		3.68	
B within A	N.S.		0.83		1.97			
A within B			0.84		1.98			
Grains/earhead								
HI1654	28.97	6	28.34	8	29.50	2	28.94	4
HI1653	28.10	7	28.35	7	27.32	7	27.92	8
HD3043 (c)	30.04	2	29.16	3	30.61	1	29.94	1
NIAW3170 (c)	29.04	5	28.87	4	28.39	5	28.76	5
HD3369	30.30	1	27.57	9	26.92	8	28.26	7
DBW296 (c)	29.64	4	29.80	1	28.01	6	29.15	3
PBW644 (c)	27.79	8	28.73	5	28.90	3	28.47	6
HI1628 (c)	27.49	9	28.60	6	26.89	9	27.66	9
HUW838 (c)	29.66	3	29.68	2	28.73	4	29.36	2
Mean	29.00		28.79		28.36		28.72	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.51		1.55		9.31	
Genotype (B)	N.S.		0.57		1.35		5.96	
B within A	N.S.		0.99		2.34			
A within B			1.06		2.52			
Date of Sowing:	10.11.2021		Date of Harvesting:				10.04.2022	

Table 2.4.4 North Western Plain Zone			RIR-TS-TAS		Hisar		2021-22	
Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HI1654	36.26	7	40.20	9	46.29	7	40.92	7
HI1653	37.07	6	43.61	5	50.41	3	43.70	5
HD3043 (c)	35.48	9	41.50	7	42.89	9	39.95	9
NIAW3170 (c)	42.86	1	47.48	3	54.69	1	48.34	2
HD3369	39.42	4	47.69	2	48.44	4	45.18	3
DBW296 (c)	38.71	5	42.11	6	47.01	5	42.61	6
PBW644 (c)	36.22	8	40.71	8	43.13	8	40.02	8
HI1628 (c)	42.28	2	45.17	4	46.60	6	44.68	4
HUW838 (c)	41.50	3	51.02	1	52.89	2	48.47	1
Mean	38.87		44.39		48.04		43.76	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.76		2.30		9.07	
Genotype (B)	**		0.82		1.94		5.61	
B within A	N.S.		1.42		3.36			
A within B			1.54		3.65			
<b>Earhead/sq.m.</b>								
HI1654	335	6	349	9	379	7	355	8
HI1653	333	7	370	6	415	4	373	6
HD3043 (c)	328	8	360	7	377	8	355	7
NIAW3170 (c)	376	1	415	1	432	1	407	1
HD3369	362	4	403	3	416	3	394	3
DBW296 (c)	356	5	378	5	396	6	377	5
PBW644 (c)	327	9	352	8	367	9	349	9
HI1628 (c)	368	3	387	4	398	5	384	4
HUW838 (c)	370	2	415	1	430	2	405	2
Mean	351		381		401		378	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		3.30		9.94		4.54	
Genotype (B)	**		10.54		25.00		8.38	
B within A	N.S.		18.26		43.30			
A within B			17.52		41.56			
<b>1000 grains weight, g</b>								
HI1654	43.97	5	44.09	6	44.58	6	44.21	6
HI1653	43.24	6	52.80	1	53.68	1	49.91	1
HD3043 (c)	32.86	9	36.98	9	38.55	9	36.13	9
NIAW3170 (c)	50.87	1	48.85	3	48.93	3	49.55	2
HD3369	45.55	3	48.11	4	48.37	4	47.35	4
DBW296 (c)	44.58	4	45.57	5	44.60	5	44.92	5
PBW644 (c)	40.79	7	40.83	8	42.84	7	41.49	7
HI1628 (c)	47.52	2	49.87	2	50.95	2	49.45	3
HUW838 (c)	40.14	8	41.66	7	42.07	8	41.29	8
Mean	43.28		45.42		46.06		44.92	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.45		1.37		5.25	
Genotype (B)	**		0.43		1.03		2.90	
B within A	**		0.75		1.79			
A within B			0.84		2.00			

Grains/earhead								
HI1654	24.67	5	26.54	4	27.49	3	26.23	4
HI1653	25.92	4	22.34	9	22.67	9	23.64	9
HD3043 (c)	33.39	1	31.29	1	29.70	1	31.46	1
NIAW3170 (c)	22.51	9	23.52	8	26.08	6	24.04	7
HD3369	23.94	8	24.57	6	24.16	7	24.22	6
DBW296 (c)	24.48	6	24.71	5	26.83	5	25.34	5
PBW644 (c)	27.33	3	28.41	3	27.45	4	27.73	3
HI1628 (c)	24.27	7	23.75	7	23.10	8	23.71	8
HUW838 (c)	28.08	2	29.63	2	29.26	2	28.99	2
Mean	26.06		26.08		26.30		26.15	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.43		1.30		8.59	
Genotype (B)	**		0.98		2.32		11.21	
B within A	N.S.		1.69		4.01			
A within B			1.65		3.92			
Date of Sowing:	26.10.2021		Date of Harvesting:				14.04.2022	

**Table 2.4.5 North Western Plain Zone RIR-TS-TAS Jammu 2021-22**

Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HI1654	41.78	1	41.39	1	40.93	2	41.37	1
HI1653	40.18	2	38.96	4	38.73	6	39.29	3
HD3043 (c)	38.54	6	38.41	6	40.96	1	39.30	2
NIAW3170 (c)	37.30	7	38.66	5	39.93	4	38.63	6
HD3369	37.21	8	39.05	3	37.50	8	37.92	8
DBW296 (c)	37.13	9	37.47	8	40.18	3	38.26	7
PBW644 (c)	38.98	4	37.17	9	37.25	9	37.80	9
HI1628 (c)	39.54	3	40.22	2	37.54	7	39.10	4
HUW838 (c)	38.68	5	38.21	7	39.22	5	38.70	5
Mean	38.82		38.84		39.14		38.93	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.44		1.32		5.86	
Genotype (B)	**		0.52		1.24		4.04	
B within A	N.S.		0.91		2.16			
A within B			0.96		2.28			
<b>Earhead/sq.m.</b>								
HI1654	327	5	346	8	342	6	338	7
HI1653	325	6	361	3	346	5	344	4
HD3043 (c)	312	7	346	8	358	3	339	6
NIAW3170 (c)	302	9	348	7	349	4	333	9
HD3369	309	8	372	1	361	1	347	2
DBW296 (c)	380	1	370	2	361	1	370	1
PBW644 (c)	353	3	361	4	301	9	338	8
HI1628 (c)	359	2	355	5	309	8	341	5
HUW838 (c)	347	4	353	6	333	7	344	3
Mean	335		357		340		344	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		5.85		17.63		8.83	
Genotype (B)	*		7.41		17.58		6.47	
B within A	**		12.84		30.46			
A within B			13.45		31.89			

1000 grains weight, g								
HI1654	26.23	9	25.60	9	26.26	8	26.03	9
HI1653	27.65	8	27.52	5	27.57	5	27.58	7
HD3043 (c)	28.22	5	29.02	2	26.76	6	28.00	4
NIAW3170 (c)	28.08	7	30.41	1	25.95	9	28.15	2
HD3369	28.64	2	25.93	7	28.32	3	27.63	5
DBW296 (c)	28.83	1	27.37	6	26.64	7	27.61	6
PBW644 (c)	28.25	4	27.65	4	29.82	1	28.57	1
HI1628 (c)	28.28	3	25.82	8	28.46	2	27.52	8
HUW838 (c)	28.14	6	27.88	3	28.24	4	28.09	3
Mean	28.04		27.47		27.56		27.69	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.63		1.89		11.76	
Genotype (B)	N.S.		0.95		2.25		10.28	
B within A	N.S.		1.64		3.90			
A within B			1.67		3.96			
Grains/earhead								
HI1654	49.69	1	47.10	1	47.11	1	47.97	1
HI1653	45.90	2	39.45	4	41.30	8	42.21	4
HD3043 (c)	44.39	3	39.42	5	43.13	3	42.31	2
NIAW3170 (c)	44.05	4	36.65	9	44.52	2	41.74	5
HD3369	43.00	5	40.76	3	36.70	9	40.15	7
DBW296 (c)	34.36	9	37.15	8	42.21	7	37.90	9
PBW644 (c)	39.78	7	37.37	7	42.31	6	39.82	8
HI1628 (c)	39.37	8	44.35	2	43.04	4	42.25	3
HUW838 (c)	39.82	6	38.98	6	42.73	5	40.51	6
Mean	42.26		40.14		42.56		41.65	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.54		4.63		19.17	
Genotype (B)	N.S.		1.98		4.70		14.27	
B within A	N.S.		3.43		8.14			
A within B			3.58		8.50			
Date of Sowing:	10.11.2021		Date of Harvesting:				28.04.2022	

**Table 2.4.6 North Western Plain Zone** **RIR-TS-TAS** **Karnal** **2021-22**

Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
	<b>Yield, q/ha</b>							
HI1654	32.94	2	34.75	2	35.37	5	34.35	3
HI1653	34.04	1	38.16	1	35.63	4	35.94	1
HD3043 (c)	28.70	6	31.45	8	32.19	7	30.78	7
NIAW3170 (c)	26.62	9	31.56	7	32.49	6	30.22	8
HD3369	30.18	4	32.43	5	31.74	2	33.45	4
DBW296 (c)	28.86	5	31.71	6	36.86	3	32.48	5
PBW644 (c)	28.16	7	33.03	4	31.44	8	30.88	6
HI1628 (c)	27.19	8	31.48	9	29.82	9	29.16	9
HUW838 (c)	30.42	3	33.95	3	38.97	1	34.44	2
Mean	29.68		33.06		34.50		32.41	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.44		1.32		7.01	
Genotype (B)	**		0.68		1.60		6.26	
B within A	*		1.17		2.78			
A within B			1.19		2.82			

Not included in pooled due to low mean yield

Earhead/sq.m.								
HI1654	398	1	388	9	383	8	389	6
HI1653	336	8	442	1	373	9	383	8
HD3043 (c)	356	7	408	6	457	1	407	1
NIAW3170 (c)	304	9	408	5	427	2	380	9
HD3369	383	2	402	7	404	5	396	5
DBW296 (c)	378	3	420	4	408	4	402	3
PBW644 (c)	368	4	438	2	399	6	402	2
HI1628 (c)	368	4	402	7	385	7	385	7
HUW838 (c)	357	6	422	3	424	3	401	4
Mean	361		414		406		394	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		15.15		45.69		19.99	
Genotype (B)	N.S.		16.69		39.59		12.71	
B within A	N.S.		28.91		68.57			
A within B			31.19		73.96			
1000 grains weight, g								
HI1654	30.01	4	30.19	5	33.27	7	31.16	5
HI1653	34.12	1	31.98	4	43.98	1	36.69	1
HD3043 (c)	24.64	9	24.09	9	28.10	9	25.61	9
NIAW3170 (c)	32.26	2	32.59	2	40.08	2	34.97	2
HD3369	31.49	3	32.79	1	34.97	3	33.08	3
DBW296 (c)	28.89	6	31.99	3	34.57	4	31.82	4
PBW644 (c)	29.99	5	29.38	6	33.52	6	30.97	6
HI1628 (c)	26.92	7	26.43	7	33.61	5	28.99	7
HUW838 (c)	26.77	8	25.04	8	31.71	8	27.84	8
Mean	29.45		29.39		34.87		31.24	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.66		2.00		11.06	
Genotype (B)	**		0.67		1.59		6.44	
B within A	**		1.16		2.75			
A within B			1.28		3.04			
Grains/earhead								
HI1654	27.90	5	29.81	3	28.31	2	28.67	3
HI1653	30.21	3	27.17	5	21.79	8	26.39	5
HD3043 (c)	33.99	2	32.42	1	25.46	5	30.63	2
NIAW3170 (c)	27.44	6	23.76	8	19.29	9	23.50	9
HD3369	26.07	9	24.74	7	26.86	3	25.89	7
DBW296 (c)	26.96	7	23.65	9	26.25	4	25.62	8
PBW644 (c)	26.21	8	26.91	6	25.22	6	26.11	6
HI1628 (c)	27.93	4	29.10	4	23.18	7	26.74	4
HUW838 (c)	34.22	1	32.18	2	29.06	1	31.82	1
Mean	28.99		27.75		25.05		27.26	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.92		5.78		36.51	
Genotype (B)	**		1.57		3.73		17.29	
B within A	N.S.		2.72		6.45			
A within B			3.20		7.59			
Date of Sowing:	16.11.2021		Date of Harvesting:		28.03.2022			

Table 2.4.7 North Western Plain Zone		RIR-TS-TAS		Ludhiana		2021-22		
Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
HI1654	34.76	8	47.33	6	46.32	8	42.80	7
HI1653	48.57	1	55.71	1	54.53	1	52.94	1
HD3043 (c)	33.68	9	46.70	8	46.89	7	42.42	8
NIAW3170 (c)	37.73	6	50.53	2	50.34	3	46.20	5
HD3369	40.46	4	46.75	7	47.75	6	44.99	6
DBW296 (c)	42.70	3	50.06	3	51.61	2	48.12	2
PBW644 (c)	36.77	7	41.88	9	43.38	9	40.68	9
HI1628 (c)	40.35	5	49.31	5	49.63	4	46.43	4
HUW838 (c)	45.34	2	49.55	4	49.39	5	48.09	3
Mean	40.04		48.65		48.87		45.85	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.88		2.65		9.94	
Genotype (B)	**		0.78		1.85		5.11	
B within A	*		1.35		3.21			
A within B			1.55		3.67			
<b>Earhead/sq.m.</b>								
HI1654	239	8	250	7	250	7	246	7
HI1653	244	6	257	6	258	6	253	6
HD3043 (c)	245	5	268	1	265	1	259	3
NIAW3170 (c)	258	1	264	2	264	2	262	1
HD3369	257	2	263	3	262	3	261	2
DBW296 (c)	246	4	260	4	261	5	256	5
PBW644 (c)	255	3	259	5	262	4	258	4
HI1628 (c)	234	9	244	9	247	8	242	9
HUW838 (c)	244	7	247	8	246	9	246	8
Mean	247		257		257		254	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		1.99		5.99		4.07	
Genotype (B)	**		3.50		8.31		4.14	
B within A	N.S.		6.07		14.39			
A within B			6.06		14.36			
<b>1000 grains weight, g</b>								
HI1654	34.14	4	37.11	8	38.49	7	36.58	7
HI1653	46.69	1	53.53	1	50.48	1	50.24	1
HD3043 (c)	28.12	9	32.65	9	30.51	9	30.43	9
NIAW3170 (c)	37.58	2	44.78	2	44.90	2	42.42	2
HD3369	36.41	3	42.69	4	42.06	5	40.39	3
DBW296 (c)	31.37	7	42.82	3	42.41	4	38.87	4
PBW644 (c)	31.26	8	37.73	7	38.15	8	35.71	8
HI1628 (c)	32.20	6	41.31	6	42.49	3	38.67	6
HUW838 (c)	32.60	5	41.86	5	41.72	6	38.73	5
Mean	34.49		41.61		41.25		39.11	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.43		1.30		5.73	
Genotype (B)	**		1.31		3.10		10.03	
B within A	N.S.		2.26		5.37			
A within B			2.18		5.17			



Grains/earhead								
HI1654	42.65	8	51.00	2	48.15	3	47.27	5
HI1653	44.04	6	40.87	9	42.41	9	42.44	8
HD3043 (c)	48.88	4	53.92	1	58.40	1	53.73	1
NIAW3170 (c)	39.01	9	42.75	7	43.45	7	41.74	9
HD3369	43.51	7	41.75	8	43.32	8	42.86	7
DBW296 (c)	55.96	2	45.01	5	46.83	5	49.27	4
PBW644 (c)	46.27	5	42.87	6	43.55	6	44.23	6
HI1628 (c)	53.53	3	48.72	3	48.03	4	50.09	3
HUW838 (c)	58.49	1	48.12	4	48.47	2	51.69	2
Mean	48.04		46.11		46.96		47.04	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.39		1.18		4.32	
Genotype (B)	**		1.84		4.36		11.73	
B within A	N.S.		3.19		7.56			
A within B			3.03		7.19			
Date of Sowing:	25.10.2021		Date of Harvesting:				15.04.2022	

Genotype	Level of Irrigation						Mean	Rk
	Zero		One		Two			
		Rk		Rk		Rk		
<b>Yield, q/ha</b>								
HI1654	43.68	4	50.77	4	51.82	3	48.76	4
HI1653	41.60	7	51.51	2	54.33	1	49.15	3
HD3043 (c)	37.65	9	41.24	9	42.84	9	40.57	9
NIAW3170 (c)	39.00	8	46.54	6	49.22	6	44.92	6
HD3369	47.55	1	51.85	1	51.88	2	50.42	1
DBW296 (c)	41.66	6	50.18	5	50.96	5	47.60	5
PBW644 (c)	42.72	5	45.87	7	44.09	7	44.22	8
HI1628 (c)	43.75	3	45.18	8	43.95	8	44.29	7
HUW838 (c)	45.65	2	51.36	3	51.33	4	49.45	2
Mean	42.58		48.28		48.94		46.60	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		1.08		3.26		12.07	
Genotype (B)	**		0.81		1.92		5.22	
B within A	**		1.41		3.33			
A within B			1.71		4.06			
<b>Earhead/sq.m.</b>								
HI1654	325	2	344	9	366	7	345	7
HI1653	270	8	360	7	353	9	328	9
HD3043 (c)	295	6	419	3	442	2	385	2
NIAW3170 (c)	283	7	450	1	459	1	397	1
HD3369	338	1	411	4	388	6	379	4
DBW296 (c)	316	4	442	2	398	5	385	3
PBW644 (c)	308	5	362	6	354	8	341	8
HI1628 (c)	265	9	364	5	406	4	345	6
HUW838 (c)	317	3	356	8	409	3	361	5
Mean	302		390		397		363	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		9.33		28.12		13.35	
Genotype (B)	**		8.87		21.03		7.33	
B within A	**		15.36		36.43			
A within B			17.22		40.85			

1000 grains weight, g								
HI1654	38.26	6	40.55	3	35.86	6	38.22	6
HI1653	46.48	1	47.10	1	47.39	1	46.99	1
HD3043 (c)	31.56	9	32.21	9	31.65	9	31.81	9
NIAW3170 (c)	41.39	2	39.17	5	39.50	5	40.02	3
HD3369	39.51	3	38.62	6	41.20	3	39.78	5
DBW296 (c)	38.59	5	41.10	2	39.79	4	39.83	4
PBW644 (c)	34.75	8	35.58	8	33.60	8	34.64	8
HI1628 (c)	39.46	4	39.33	4	42.50	2	40.43	2
HUW838 (c)	36.96	7	37.21	7	35.55	7	36.57	7
Mean	38.55		38.99		38.56		38.70	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.13		3.39		15.11	
Genotype (B)	**		0.98		2.32		7.58	
B within A	N.S.		1.69		4.02			
A within B			1.95		4.63			
Grains/earhead								
HI1654	35.22	6	36.50	2	40.11	1	37.28	3
HI1653	33.14	9	30.50	7	32.56	5	32.07	7
HD3043 (c)	40.56	2	30.99	6	30.95	7	34.17	4
NIAW3170 (c)	33.61	8	26.60	9	27.15	8	29.12	9
HD3369	35.89	5	32.88	4	32.56	6	33.77	5
DBW296 (c)	34.40	7	27.81	8	33.20	4	31.80	8
PBW644 (c)	39.84	3	36.20	3	37.11	2	37.72	2
HI1628 (c)	42.34	1	32.56	5	26.16	9	33.69	6
HUW838 (c)	39.23	4	39.27	1	35.59	3	38.03	1
Mean	37.14		32.59		32.82		34.18	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.15		3.48		17.54	
Genotype (B)	**		1.47		3.48		12.87	
B within A	N.S.		2.54		6.02			
A within B			2.66		6.30			
Date of Sowing:	02.11.2021		Date of Harvesting:				07.04.2022	

Table 2.4.9 North Western Plain Zone		RIR-TS-TAS		Sriganganagar		2021-22		
Genotype	Level of Irrigation						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
Yield, q/ha								
HI1654	23.40	3	43.81	3	55.07	6	40.76	4
HI1653	26.22	2	43.27	4	50.17	9	39.89	5
HD3043 (c)	23.20	4	28.67	9	53.91	7	35.26	9
NIAW3170 (c)	29.49	1	47.59	1	58.10	5	45.06	1
HD3369	23.03	5	39.86	6	61.70	2	41.53	2
DBW296 (c)	15.10	9	44.63	2	59.25	4	39.66	6
PBW644 (c)	22.55	6	39.56	7	61.80	1	41.30	3
HI1628 (c)	19.35	8	34.42	8	59.59	3	37.79	8
HUW838 (c)	22.55	6	40.78	5	52.24	8	38.53	7
Mean	22.77		40.29		56.87		39.97	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		1.02		3.08		13.27	
Genotype (B)	**		1.44		3.42		10.83	
B within A	**		2.50		5.93			
A within B			2.57		6.09			

Earhead/sq.m.								
HI1654	290	8	356	8	398	8	348	8
HI1653	283	9	349	9	391	9	341	9
HD3043 (c)	299	4	365	4	407	4	357	4
NIAW3170 (c)	299	3	365	3	408	3	357	3
HD3369	307	1	373	1	415	1	365	1
DBW296 (c)	291	7	357	7	399	7	349	7
PBW644 (c)	300	2	366	2	409	2	358	2
HI1628 (c)	297	6	363	6	405	6	355	6
HUW838 (c)	297	5	363	5	406	5	355	5
Mean	296		362		404		354	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		5.37		16.20		7.89	
Genotype (B)	**		2.56		6.06		2.17	
B within A	N.S.		4.43		10.50			
A within B			6.80		16.13			
1000 grains weight, g								
HI1654	27.01	8	30.85	7	40.26	7	32.71	7
HI1653	27.82	3	31.53	5	40.65	3	33.33	3
HD3043 (c)	26.74	9	30.15	9	39.74	9	32.21	9
NIAW3170 (c)	27.12	7	31.59	4	40.49	6	33.07	6
HD3369	27.18	6	30.24	8	39.94	8	32.45	8
DBW296 (c)	27.67	5	31.74	3	40.55	5	33.32	4
PBW644 (c)	29.85	1	34.42	1	43.46	1	35.91	1
HI1628 (c)	27.77	4	31.26	6	40.59	4	33.20	5
HUW838 (c)	29.81	2	32.84	2	42.51	2	35.05	2
Mean	27.89		31.62		40.91		33.47	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.08		0.23		1.17	
Genotype (B)	**		0.12		0.29		1.08	
B within A	*		0.21		0.50			
A within B			0.21		0.50			
Grains/earhead								
HI1654	30.13	3	39.80	2	34.35	6	34.76	2
HI1653	33.40	2	39.23	4	31.53	8	34.72	3
HD3043 (c)	29.25	4	26.13	9	33.35	7	29.58	9
NIAW3170 (c)	36.58	1	41.23	1	35.19	4	37.67	1
HD3369	27.72	5	35.36	5	37.20	1	33.43	4
DBW296 (c)	18.82	9	39.55	3	36.62	2	31.66	5
PBW644 (c)	25.41	6	31.36	7	34.82	5	30.53	6
HI1628 (c)	23.43	8	30.35	8	36.20	3	30.00	7
HUW838 (c)	25.40	7	34.11	6	30.31	9	29.94	8
Mean	27.79		35.24		34.40		32.48	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		1.23		3.71		19.68	
Genotype (B)	**		1.21		2.87		11.17	
B within A	**		2.09		4.97			
A within B			2.33		5.52			
Date of Sowing:	05.11.2021		Date of Harvesting:				25.03.2022	

Table 2.6.1 North Western Plain Zone		SPL-IR-ES-HYPT BISA Ladawal 2021-22				
Genotype	Nutrient Management NM)				Mean	Rk
	Rec NPK	Rk	150% Rec NPK+FYM+GR	Rk		
<b>Yield, q/ha</b>						
DBW370	53.84	6	62.47	3	58.15	4
DBW187 (c)	54.95	5	64.47	2	59.71	3
HD3086 (c)	51.20	8	55.47	8	53.34	8
DBW327 (c)	57.36	3	65.03	1	61.20	1
DBW332 (c)	57.78	2	61.71	4	59.74	2
DBW303 (c)	52.50	7	58.94	5	55.72	7
DBW371	57.05	4	57.72	6	57.39	5
PBW872	58.81	1	55.86	7	57.33	6
DBW372	50.32	9	55.11	9	52.71	9
Mean	54.87		59.64		57.25	
F. Test			SEm	CD (0.05)	CV (%)	
NM (A)	*		0.73	3.02	6.63	
Genotype(B)	*		1.78	4.27	7.63	
B within A	N.S.		2.52	6.04		
A within B			2.49	5.96		
<b>Earhead/sq.m.</b>						
DBW370	255	9	295	5	275	5
DBW187 (c)	284	3	335	2	309	3
HD3086 (c)	297	2	341	1	319	2
DBW327 (c)	259	7	289	6	274	6
DBW332 (c)	260	6	284	7	272	8
DBW303 (c)	269	4	278	8	273	7
DBW371	259	7	278	8	268	9
PBW872	267	5	298	4	282	4
DBW372	327	1	335	2	331	1
Mean	275		303		289	
F. Test			SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		12.28	50.71	22.05	
Genotype(B)	**		9.86	23.63	8.35	
B within A	N.S.		13.95	33.41		
A within B			17.99	43.10		
<b>1000 grains weight, g</b>						
DBW370	47.63	5	37.60	9	42.62	7
DBW187 (c)	50.00	2	41.41	5	45.70	4
HD3086 (c)	46.77	6	38.83	8	42.80	6
DBW327 (c)	52.33	1	46.33	2	49.33	2
DBW332 (c)	45.53	7	42.30	4	43.92	5
DBW303 (c)	42.30	8	41.33	6	41.82	8
DBW371	48.43	4	45.27	3	46.85	3
PBW872	49.67	3	51.00	1	50.33	1
DBW372	39.50	9	40.43	7	39.97	9
Mean	46.91		42.72		44.82	
F. Test			SEm	CD (0.05)	CV (%)	
NM (A)	*		0.57	2.34	6.56	
Genotype(B)	**		0.37	0.90	2.05	
B within A	**		0.53	1.27		
A within B			0.75	1.81		

Grains/earhead						
DBW370	44.38	5	56.68	1	50.53	2
DBW187 (c)	38.84	8	46.87	5	42.85	6
HD3086 (c)	36.86	9	42.33	7	39.60	9
DBW327 (c)	42.51	6	48.95	4	45.73	4
DBW332 (c)	48.90	1	52.48	2	50.69	1
DBW303 (c)	46.31	2	51.34	3	48.82	3
DBW371	45.57	3	45.84	6	45.70	5
PBW872	44.52	4	37.27	9	40.90	7
DBW372	39.14	7	40.69	8	39.91	8
Mean	43.00		46.94		44.97	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		1.45	5.98	16.72	
Genotype(B)	**		1.89	4.54	10.32	
B within A	N.S.		2.68	6.42		
A within B			2.91	6.97		
Plant Height, cm						
DBW370	97.33	8	99.77	2	98.55	7
DBW187 (c)	109.93	1	98.83	4	104.38	1
HD3086 (c)	99.73	7	89.90	9	94.82	8
DBW327 (c)	104.03	5	95.83	6	99.93	5
DBW332 (c)	106.37	2	100.93	1	103.65	2
DBW303 (c)	105.53	4	97.00	5	101.27	4
DBW371	106.00	3	99.53	3	102.77	3
PBW872	103.27	6	95.63	7	99.45	6
DBW372	91.87	9	93.57	8	92.72	9
Mean	102.67		96.78		99.73	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		1.13	4.65	5.87	
Genotype(B)	**		1.24	2.96	3.04	
B within A	**		1.75	4.19		
A within B			2.00	4.78		
Date of Sowing:	29.10.2021		Date of Harvesting:	08.04.2022	10.04.2022	

**Table 2.6.2 North Western Plain Zone** **SPL-IR-ES-HYPT** **Delhi** **2021-22**

Genotype	Nutrient Management NM)				Mean	Rk
	Rec NPK	Rk	150% Rec NPK+FYM+GR	Rk		
<b>Yield, q/ha</b>						
DBW370	56.28	9	58.14	9	57.21	9
DBW187 (c)	59.01	5	60.11	5	59.36	5
HD3086 (c)	57.05	8	58.77	8	57.91	8
DBW327 (c)	59.40	2	60.96	2	60.18	2
DBW332 (c)	59.35	3	60.42	4	59.88	4
DBW303 (c)	57.78	6	59.10	6	58.44	6
DBW371	60.33	1	62.72	1	61.02	1
PBW872	59.26	4	60.69	3	59.97	3
DBW372	57.43	7	58.81	7	58.12	7
Mean	58.44		59.86		59.14	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.26	1.09	2.32	
Genotype(B)	**		0.13	0.31	0.53	
B within A	N.S.		0.18	0.44		
A within B			0.31	0.75		

Not included in pooled due to low mean yield

<b>Earhead/sq.m.</b>						
DBW370	414	9	557	6	486	7
DBW187 (c)	436	8	531	8	484	8
HD3086 (c)	593	3	620	1	606	1
DBW327 (c)	611	1	562	5	587	3
DBW332 (c)	601	2	555	7	578	4
DBW303 (c)	483	6	571	3	527	6
DBW371	587	4	567	4	577	5
PBW872	569	5	617	2	593	2
DBW372	438	7	493	9	465	9
Mean	526		564		545	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		23.15	95.62	22.09	
Genotype(B)	**		22.44	53.75	10.09	
B within A	N.S.		31.73	76.01		
A within B			37.83	90.63		
<b>1000 grains weight, g</b>						
DBW370	37.12	8	38.56	8	37.84	8
DBW187 (c)	41.62	1	42.72	1	42.17	1
HD3086 (c)	39.45	3	40.94	3	40.20	3
DBW327 (c)	40.38	2	40.97	2	40.67	2
DBW332 (c)	37.97	5	38.92	4	38.44	5
DBW303 (c)	37.39	7	38.83	6	38.11	6
DBW371	38.09	4	38.91	5	38.50	4
PBW872	37.47	6	38.72	7	38.10	7
DBW372	36.70	9	37.71	9	37.21	9
Mean	38.47		39.59		39.03	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.13	0.54	1.75	
Genotype(B)	**		0.17	0.42	1.09	
B within A	N.S.		0.25	0.59		
A within B			0.27	0.64		
<b>Grains/earhead</b>						
DBW370	36.69	1	27.33	5	32.01	2
DBW187 (c)	32.55	3	26.63	7	29.59	3
HD3086 (c)	24.44	8	23.31	9	23.87	9
DBW327 (c)	24.09	9	28.29	4	26.19	8
DBW332 (c)	26.00	7	29.53	2	27.77	6
DBW303 (c)	31.99	4	26.86	6	29.43	4
DBW371	27.02	6	28.78	3	27.90	5
PBW872	27.82	5	25.46	8	26.64	7
DBW372	35.76	2	31.66	1	33.71	1
Mean	29.60		27.54		28.57	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		1.43	5.90	25.98	
Genotype(B)	**		1.37	3.29	11.79	
B within A	*		1.94	4.66		
A within B			2.32	5.57		

Plant Height, cm						
DBW370	91.17	5	93.67	6	92.42	6
DBW187 (c)	101.00	1	104.00	1	102.50	1
HD3086 (c)	90.13	8	93.00	7	91.57	8
DBW327 (c)	91.67	4	95.33	4	93.50	4
DBW332 (c)	90.67	7	93.00	7	91.83	7
DBW303 (c)	82.00	9	85.67	9	83.83	9
DBW371	98.33	2	100.67	2	99.50	2
PBW872	91.00	6	94.33	5	92.67	5
DBW372	94.33	3	97.33	3	95.83	3
Mean	92.26		95.22		93.74	
	F. Test		SEm		CD (0.05)	CV (%)
NM (A)	**		0.05		0.23	0.30
Genotype(B)	**		0.31		0.74	0.81
B within A	N.S.		0.44		1.05	
A within B			0.42		1.00	
Date of Sowing:	28.10.2021		Date of Harvesting:		20.03.2022	

**Table 2.6.3 North Western Plain Zone SPL-IR-ES-HYPT Gurdaspur 2021-22**

Genotype	Nutrient Management NM)		150% Rec NPK+FYM+GR	Rk	Mean	Rk
	Rec NPK	Rk				
<b>Yield, q/ha</b>						
DBW370	61.98	2	48.57	8	55.28	6
DBW187 (c)	48.11	8	45.59	9	46.85	9
HD3086 (c)	49.31	7	60.76	4	55.03	7
DBW327 (c)	47.91	9	66.62	1	57.26	3
DBW332 (c)	57.71	3	57.6	7	57.16	4
DBW303 (c)	56.17	4	58.10	5	57.13	5
DBW371	52.23	6	57.16	6	54.69	8
PBW872	62.24	1	63.13	3	62.69	1
DBW372	59.30	5	64.70	2	59.55	2
Mean	54.45		57.91		56.18	
	F. Test		SEm		CD (0.05)	CV (%)
NM (A)	*		0.49		2.00	4.49
Genotype(B)	**		1.08		2.58	4.69
B within A	**		1.52		3.65	
A within B			1.51		3.63	
<b>Earhead/sq.m.</b>						
DBW370	324	8	362	4	343	8
DBW187 (c)	350	5	338	9	344	7
HD3086 (c)	352	4	350	8	351	5
DBW327 (c)	352	3	359	6	355	3
DBW332 (c)	336	6	358	7	347	6
DBW303 (c)	332	7	375	3	353	4
DBW371	323	9	359	5	341	9
PBW872	384	1	382	2	383	1
DBW372	358	2	392	1	375	2
Mean	346		364		355	
	F. Test		SEm		CD (0.05)	CV (%)
NM (A)	*		2.17		8.96	3.18
Genotype(B)	*		9.68		23.20	6.69
B within A	N.S.		13.69		32.80	
A within B			13.09		31.36	

1000 grains weight, g						
DBW370	50.37	1	36.83	9	43.60	4
DBW187 (c)	39.29	7	38.80	8	39.04	8
HD3086 (c)	29.75	9	39.28	7	34.52	9
DBW327 (c)	40.84	6	52.41	1	46.63	1
DBW332 (c)	45.64	2	43.58	3	44.61	3
DBW303 (c)	42.28	5	40.13	6	41.21	6
DBW371	43.55	4	41.38	5	42.47	5
PBW872	44.23	3	46.23	2	45.23	2
DBW372	37.62	8	42.01	4	39.81	7
Mean	41.51		42.30		41.90	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.28	1.16	3.48	
Genotype(B)	**		0.76	1.81	4.42	
B within A	**		1.07	2.56		
A within B			1.05	2.51		
Grains/earhead						
DBW370	38.01	5	36.51	6	37.26	6
DBW187 (c)	35.19	8	34.83	9	35.01	8
HD3086 (c)	47.19	1	44.23	1	45.71	1
DBW327 (c)	33.39	9	35.52	8	34.46	9
DBW332 (c)	38.17	4	36.53	5	37.35	5
DBW303 (c)	40.40	2	38.79	3	39.59	3
DBW371	37.43	6	38.59	4	38.01	4
PBW872	36.65	7	35.82	7	36.24	7
DBW372	40.29	3	39.38	2	39.84	2
Mean	38.52		37.80		38.16	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.13	0.55	1.82	
Genotype(B)	**		1.20	2.87	7.69	
B within A	N.S.		1.70	4.06		
A within B			1.60	3.84		
Plant Height, cm						
DBW370	86.93	7	91.07	1	89.00	3
DBW187 (c)	88.60	4	84.47	8	86.53	7
HD3086 (c)	86.67	8	82.87	9	84.77	9
DBW327 (c)	85.87	9	85.53	7	85.70	8
DBW332 (c)	88.53	6	88.13	4	88.33	5
DBW303 (c)	91.60	3	86.27	6	88.93	4
DBW371	95.53	1	89.80	3	92.67	2
PBW872	88.60	4	87.70	5	88.15	6
DBW372	95.27	2	90.93	2	93.10	1
Mean	89.73		87.42		88.58	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.42	1.73	2.45	
Genotype(B)	**		0.79	1.89	2.19	
B within A	**		1.12	2.68		
A within B			1.13	2.72		
Date of Sowing:	25.10.2021		Date of Harvesting:	14.04.2022		



Table 2.6.4 North Western Plain Zone			SPL-IR-ES-HYPT	Hisar	2021-22
Genotype	Nutrient Management NM)		Rk	Mean	Rk
	100% Rec NPK	150% Rec NPK+FYM+GR			
<b>Yield, q/ha</b>					
DBW370	59.08	5	65.61	4	62.35
DBW187 (c)	59.93	4	67.76	2	63.84
HD3086 (c)	58.88	6	62.79	7	60.83
DBW327 (c)	61.77	3	64.76	5	63.27
DBW332 (c)	56.02	8	62.31	8	59.17
DBW303 (c)	50.54	9	58.54	9	54.54
DBW371	63.16	2	66.60	3	64.88
PBW872	66.05	1	68.47	1	67.26
DBW372	56.77	7	63.10	6	59.93
Mean	59.13		64.44		61.79
	F. Test		SEm	CD (0.05)	CV (%)
NM (A)	*		0.52	2.16	4.41
Genotype(B)	**		1.15	2.76	4.57
B within A	N.S.		1.63	3.91	
A within B			1.63	3.89	
<b>Earhead/sq.m.</b>					
DBW370	381	6	410	5	396
DBW187 (c)	411	3	422	3	417
HD3086 (c)	377	7	405	7	391
DBW327 (c)	402	4	413	4	408
DBW332 (c)	367	8	397	8	382
DBW303 (c)	358	9	381	9	370
DBW371	420	2	432	2	426
PBW872	423	1	434	1	429
DBW372	382	5	410	5	396
Mean	391		412		401
	F. Test		SEm	CD (0.05)	CV (%)
NM (A)	*		3.28	13.54	4.24
Genotype(B)	*		13.11	31.42	8.00
B within A	N.S.		18.55	44.43	
A within B			17.79	42.62	
<b>1000 grains weight, g</b>					
DBW370	41.29	7	39.52	7	40.41
DBW187 (c)	46.61	3	45.21	3	45.91
HD3086 (c)	43.92	5	40.09	6	42.00
DBW327 (c)	44.50	4	41.61	4	43.05
DBW332 (c)	43.28	6	41.48	5	42.38
DBW303 (c)	38.65	9	38.33	8	38.49
DBW371	48.73	1	46.91	2	47.82
PBW872	48.66	2	47.05	1	47.85
DBW372	39.26	8	35.29	9	37.28
Mean	43.88		41.72		42.80
	F. Test		SEm	CD (0.05)	CV (%)
NM (A)	*		0.20	0.83	2.45
Genotype(B)	**		0.54	1.29	3.08
B within A	N.S.		0.76	1.82	
A within B			0.75	1.79	

Grains/earhead						
DBW370	37.69	2	40.85	2	39.27	2
DBW187 (c)	31.31	8	35.66	7	33.49	7
HD3086 (c)	35.90	4	39.29	4	37.60	4
DBW327 (c)	34.63	6	38.10	5	36.36	6
DBW332 (c)	35.34	5	38.04	6	36.69	5
DBW303 (c)	36.71	3	40.34	3	38.52	3
DBW371	30.96	9	33.01	9	31.99	9
PBW872	32.35	7	33.59	8	32.97	8
DBW372	38.20	1	43.70	1	40.95	1
Mean	34.79		38.06		36.43	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.59	2.43	8.39	
Genotype(B)	*		1.77	4.23	11.89	
B within A	N.S.		2.50	5.99		
A within B			2.43	5.82		
Plant Height, cm						
DBW370	101.67	8	95.00	9	98.33	9
DBW187 (c)	108.00	1	99.67	3	103.83	1
HD3086 (c)	104.33	4	99.33	4	101.83	4
DBW327 (c)	101.00	9	98.33	8	99.67	8
DBW332 (c)	105.00	3	100.67	1	102.83	3
DBW303 (c)	103.33	6	98.67	7	101.00	6
DBW371	106.33	2	100.00	2	103.17	2
PBW872	103.67	5	99.00	5	101.33	5
DBW372	102.67	7	99.00	5	100.83	7
Mean	104.00		98.85		101.43	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.54	2.23	2.77	
Genotype(B)	**		0.79	1.89	1.91	
B within A	N.S.		1.12	2.67		
A within B			1.18	2.83		
Date of Sowing:	25.10.2021		Date of Harvesting:		10.04.2022	

**Table 2.6.5 North Western Plain Zone** **SPL-IR-ES-HYPT** **Karnal** **2021-22**

Genotype	Nutrient Management NM)		Yield, q/ha		Mean	Rk
	100% Rec NPK	Rk	150% Rec NPK+FYM+GR	Rk		
DBW370	63.52	1	69.73	3	66.63	3
DBW187 (c)	56.14	7	67.16	6	61.65	7
HD3086 (c)	46.86	9	63.95	8	55.40	9
DBW327 (c)	61.57	4	72.12	2	66.85	2
DBW332 (c)	58.98	5	65.93	7	62.45	6
DBW303 (c)	52.15	8	62.85	9	57.50	8
DBW371	62.74	3	68.60	4	65.67	4
PBW872	63.16	2	73.23	1	68.19	1
DBW372	58.01	6	67.58	5	62.80	5
Mean	58.13		67.91		63.02	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.78	3.22	6.43	
Genotype(B)	**		1.34	3.21	5.20	
B within A	N.S.		1.89	4.53		
A within B			1.95	4.67		

<b>Earhead/sq.m.</b>						
DBW370	416	7	452	7	434	7
DBW187 (c)	498	1	531	1	514	1
HD3086 (c)	493	2	497	3	495	3
DBW327 (c)	421	6	453	6	437	6
DBW332 (c)	400	8	421	9	410	9
DBW303 (c)	448	4	471	4	460	4
DBW371	391	9	430	8	411	8
PBW872	436	5	468	5	452	5
DBW372	491	3	509	2	500	2
Mean	444		470		457	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		7.97	32.90	9.06	
Genotype(B)	**		12.07	28.92	6.47	
B within A	N.S.		17.07	40.90		
A within B			17.96	43.03		
<b>1000 grains weight, g</b>						
DBW370	43.06	9	39.96	8	41.51	9
DBW187 (c)	48.97	4	47.11	4	48.04	4
HD3086 (c)	46.87	5	43.08	6	44.98	5
DBW327 (c)	50.52	3	49.49	2	50.01	2
DBW332 (c)	45.48	6	43.11	5	44.30	6
DBW303 (c)	44.86	7	41.34	7	43.10	7
DBW371	50.94	2	47.63	3	49.29	3
PBW872	52.02	1	50.09	1	51.06	1
DBW372	44.38	8	39.16	9	41.77	8
Mean	47.46		44.55		46.00	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	**		0.11	0.45	1.22	
Genotype(B)	**		0.43	1.03	2.28	
B within A	N.S.		0.61	1.45		
A within B			0.58	1.39		
<b>Grains/earhead</b>						
DBW370	35.46	1	38.61	1	37.03	1
DBW187 (c)	23.02	8	27.11	9	25.07	9
HD3086 (c)	20.30	9	29.93	8	25.12	8
DBW327 (c)	29.00	4	32.21	6	30.60	4
DBW332 (c)	32.51	2	36.42	2	34.46	2
DBW303 (c)	26.07	7	32.31	5	29.19	7
DBW371	31.77	3	33.74	4	32.75	3
PBW872	27.87	5	31.30	7	29.59	6
DBW372	26.69	6	34.00	3	30.35	5
Mean	28.08		32.85		30.46	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.64	2.64	10.92	
Genotype(B)	**		0.94	2.26	7.57	
B within A	N.S.		1.33	3.19		
A within B			1.41	3.38		

Plant Height, cm						
DBW370	102.22	6	93.96	3	98.09	3
DBW187 (c)	104.62	4	90.73	5	97.67	4
HD3086 (c)	99.89	9	84.16	9	92.03	9
DBW327 (c)	100.77	8	91.52	4	96.14	6
DBW332 (c)	100.99	7	86.66	8	93.83	8
DBW303 (c)	104.67	3	94.15	2	99.41	2
DBW371	105.94	1	96.28	1	101.11	1
PBW872	102.84	5	89.35	6	96.09	7
DBW372	104.76	2	88.43	7	96.60	5
Mean	102.97		90.58		96.77	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	**		0.77	3.19	4.15	
Genotype(B)	**		0.75	1.80	1.90	
B within A	**		1.06	2.55		
A within B			1.27	3.03		
Date of Sowing:	31.10.2021		Date of Harvesting:		14.04.2022	

**Table 2.6.6 North Western Plain Zone** **SPL-IR-ES-HYPT** **Ludhiana** **2021-22**

Genotype	Nutrient Management NM)		150% Rec NPK+FYM+GR	Rk	Mean	Rk
	100% Rec NPK	Rk				
<b>Yield, q/ha</b>						
DBW370	54.17	8	60.81	7	57.49	8
DBW187 (c)	63.67	1	67.47	1	65.57	1
HD3086 (c)	52.17	9	57.28	9	54.73	9
DBW327 (c)	56.83	5	60.90	6	58.86	6
DBW332 (c)	59.94	2	63.96	2	61.95	2
DBW303 (c)	57.20	4	61.26	5	59.23	5
DBW371	58.20	3	63.42	3	60.81	3
PBW872	56.82	7	62.25	4	59.53	4
DBW372	56.81	6	60.39	8	58.60	7
Mean	57.31		61.97		59.64	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.71	2.92	6.16	
Genotype(B)	**		0.80	1.91	3.27	
B within A	N.S.		1.13	2.70		
A within B			1.28	3.06		
<b>Earhead/sq.m.</b>						
DBW370	289	5	315	4	302	4
DBW187 (c)	306	2	323	3	314	2
HD3086 (c)	314	1	341	1	328	1
DBW327 (c)	295	4	306	5	301	5
DBW332 (c)	289	5	291	9	290	8
DBW303 (c)	278	9	299	7	289	9
DBW371	296	3	299	8	297	6
PBW872	289	5	325	2	307	3
DBW372	281	8	300	6	290	7
Mean	293		311		302	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		1.95	8.03	3.35	
Genotype(B)	N.S.		9.10	21.80	7.38	
B within A	N.S.		12.87	30.83		
A within B			12.29	29.44		

1000 grains weight, g						
DBW370	40.70	6	42.04	6	41.37	5
DBW187 (c)	42.00	3	48.49	3	45.25	3
HD3086 (c)	37.93	8	38.50	9	38.22	9
DBW327 (c)	47.26	2	49.56	2	48.41	2
DBW332 (c)	38.03	7	41.42	7	39.73	8
DBW303 (c)	36.66	9	44.49	4	40.58	7
DBW371	41.91	4	42.52	5	42.22	4
PBW872	47.81	1	51.33	1	49.57	1
DBW372	40.97	5	41.22	8	41.09	6
Mean	41.48		44.40		42.94	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	N.S.		0.80	3.32	9.74	
Genotype(B)	**		0.98	2.36	5.62	
B within A	N.S.		1.39	3.34		
A within B			1.54	3.69		
Grains/earhead						
DBW370	46.29	6	46.23	4	46.26	6
DBW187 (c)	49.68	3	43.19	7	46.44	5
HD3086 (c)	44.14	7	43.83	6	43.99	7
DBW327 (c)	40.90	9	40.19	8	40.54	8
DBW332 (c)	54.92	2	53.19	1	54.06	1
DBW303 (c)	56.33	1	46.09	5	51.21	2
DBW371	47.07	5	51.57	2	49.32	4
PBW872	41.16	8	37.79	9	39.47	9
DBW372	49.54	4	49.36	3	49.45	3
Mean	47.78		45.72		46.75	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.21	0.86	2.31	
Genotype(B)	**		2.04	4.88	10.68	
B within A	N.S.		2.88	6.90		
A within B			2.73	6.53		
Plant Height, cm						
DBW370	73.00	9	71.33	7	72.17	9
DBW187 (c)	80.33	4	72.33	4	76.33	4
HD3086 (c)	76.67	7	71.33	7	74.00	7
DBW327 (c)	78.00	6	72.00	5	75.00	6
DBW332 (c)	81.33	3	73.67	1	77.50	3
DBW303 (c)	82.00	2	73.67	1	77.83	2
DBW371	85.00	1	73.00	3	79.00	1
PBW872	79.00	5	71.67	6	75.33	5
DBW372	75.33	8	70.33	9	72.83	8
Mean	78.96		72.15		75.56	
	F. Test		SEm	CD (0.05)	CV (%)	
NM (A)	*		0.93	3.86	6.43	
Genotype(B)	**		1.09	2.61	3.53	
B within A	N.S.		1.54	3.69		
A within B			1.73	4.13		
Date of Sowing:	25.10.2021		Date of Harvesting:		05.04.2022	

Table 2.6.7 North Western Plain Zone		SPL-IR-ES-HYPT		Pantnagar		2021-22	
Genotype	Nutrient Management (NM)				Mean	Rk	
	100% Rec NPK	Rk	150% Rec NPK+FYM+GR	Rk			
<b>Yield, q/ha</b>							
DBW370	66.15	1	67.29	2	66.72	1	
DBW187 (c)	48.24	9	52.50	8	50.37	8	
HD3086 (c)	51.14	8	46.64	8	48.89	9	
DBW327 (c)	58.36	3	42.58	9	50.47	7	
DBW332 (c)	56.52	5	57.42	1	61.97	4	
DBW303 (c)	52.58	7	60.35	6	56.46	6	
DBW371	60.54	4	66.80	4	63.67	2	
PBW872	58.24	4	66.83	3	62.53	3	
DBW372	55.03	6	64.32	5	58.67	5	
Mean	56.09		59.41		57.75		
	F. Test		SEm	CD (0.05)	CV (%)		
NM (A)	*		0.46	1.90	4.14		
Genotype(B)	**		1.87	4.47	7.92		
B within A	**		2.64	6.33			
A within B			2.53	6.07			
<b>Earhead/sq.m.</b>							
DBW370	343	9	422	5	382	7	
DBW187 (c)	378	3	392	8	385	6	
HD3086 (c)	470	1	478	1	474	1	
DBW327 (c)	350	7	398	7	374	9	
DBW332 (c)	359	6	398	6	379	8	
DBW303 (c)	406	2	383	9	394	5	
DBW371	363	5	428	4	395	3	
PBW872	374	4	447	2	410	2	
DBW372	343	8	447	2	395	4	
Mean	376		421		399		
	F. Test		SEm	CD (0.05)	CV (%)		
NM (A)	*		4.55	18.78	5.93		
Genotype(B)	*		18.66	44.69	11.46		
B within A	N.S.		26.38	63.21			
A within B			25.29	60.58			
<b>1000 grains weight, g</b>							
DBW370	42.95	8	44.56	7	43.75	7	
DBW187 (c)	47.75	5	45.43	5	46.59	5	
HD3086 (c)	43.12	7	43.07	8	43.10	8	
DBW327 (c)	54.45	1	50.69	3	52.57	3	
DBW332 (c)	45.75	6	44.63	6	45.19	6	
DBW303 (c)	41.19	9	42.78	9	41.99	9	
DBW371	53.16	2	52.17	2	52.67	2	
PBW872	51.66	3	54.64	1	53.15	1	
DBW372	49.41	4	48.29	4	48.85	4	
Mean	47.72		47.36		47.54		
	F. Test		SEm	CD (0.05)	CV (%)		
NM (A)	N.S.		0.75	3.10	8.21		
Genotype(B)	**		1.29	3.09	6.64		
B within A	N.S.		1.82	4.36			
A within B			1.87	4.49			

Grains/earhead						
DBW370	45.63	1	35.92	3	40.77	1
DBW187 (c)	27.45	8	29.76	6	28.60	7
HD3086 (c)	25.39	9	22.62	8	24.00	9
DBW327 (c)	30.75	7	21.38	9	26.06	8
DBW332 (c)	34.54	2	38.27	1	36.40	2
DBW303 (c)	31.83	4	36.94	2	34.39	3
DBW371	31.76	5	30.14	4	30.95	5
PBW872	31.53	6	27.48	7	29.51	6
DBW372	32.82	3	30.05	5	31.44	4
Mean	32.41		30.29		31.35	
	F. Test		SEm		CD (0.05)	CV (%)
NM (A)	N.S.		0.65		2.68	10.75
Genotype(B)	**		2.25		5.38	17.55
B within A	N.S.		3.18		7.61	
A within B			3.06		7.34	
Plant Height, cm						
DBW370	102.20	1	95.07	1	98.63	1
DBW187 (c)	98.53	5	87.67	7	93.10	6
HD3086 (c)	93.07	9	86.00	8	89.53	9
DBW327 (c)	98.87	4	90.20	3	94.53	3
DBW332 (c)	95.73	6	88.67	6	92.20	8
DBW303 (c)	101.93	2	89.20	5	95.57	2
DBW371	95.67	7	89.80	4	92.73	7
PBW872	95.07	8	92.27	2	93.67	4
DBW372	101.07	3	85.40	9	93.23	5
Mean	98.01		89.36		93.69	
	F. Test		SEm		CD (0.05)	CV (%)
NM (A)	*		0.83		3.43	4.60
Genotype(B)	N.S.		1.73		4.15	4.53
B within A	N.S.		2.45		5.86	
A within B			2.45		5.88	
Date of Sowing:	26.10.2021		Date of Harvesting:		04.04.2022	

Table 3.2.1. North Eastern Plains Zone		IR-TS-DOS-TAS		Ayodhya	2021-22	
Genotype	Date of Sowing		Mean	Rk	Rk	Rk
	Timely	Late				
<b>Yield, q/ha</b>						
HD 3411	40.31	7	32.54	8	36.43	8
HD 2967 (C)	42.69	5	33.73	5	38.21	5
HD 3086 (C)	39.92	8	33.15	7	36.54	7
PBW 826	44.86	3	35.71	3	40.29	3
HD 3406	44.28	4	34.92	4	39.60	4
HD 3249(C)	45.47	2	35.50	2	40.69	2
HD 2733 (C)	42.10	6	33.21	6	37.65	6
DBW 187 (C)	45.87	1	37.10	1	41.48	1
Mean	43.19		34.53		38.86	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.01	0.04	0.11	
Genotype (B)		**	0.44	1.05	2.74	
B within A		N.S.	0.62	1.48		
A within B			0.58	1.38		
<b>Earhead/sqm</b>						
HD 3411	515	2	525	2	520	2
HD 2967 (C)	506	3	518	3	512	3
HD 3086 (C)	476	5	450	8	463	8
PBW 826	473	8	459	7	466	7
HD 3406	555	1	542	1	548	1
HD 3249(C)	474	6	488	4	481	5
HD 2733 (C)	499	4	470	5	485	4
DBW 187 (C)	474	6	460	6	467	6
Mean	497		489		493	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0	0	0	
Genotype (B)		**	3	8	2	
B within A		**	4	11		
A within B			4	10		
<b>Grains/Earhead</b>						
HD 3411	20.77	7	17.1	8	18.9	7
HD 2967 (C)	21.72	6	17.8	6	19.8	6
HD 3086 (C)	22.29	4	20.3	3	21.3	4
PBW 826	24.10	3	20.7	2	22.4	2
HD 3406	20.31	8	17.4	7	18.9	8
HD 3249(C)	24.23	1	19.4	4	21.8	3
HD 2733 (C)	22.00	5	18.9	5	20.5	5
DBW 187 (C)	24.16	2	21.1	1	22.6	1
Mean	22.45		19.1		20.8	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.0	0.1	0.3	
Genotype (B)		**	0.3	0.7	3.6	
B within A		N.S.	0.4	1.0		
A within B			0.4	1.0		
<b>1000 Grains Weight, g</b>						
HD 3411	37.70	7	36.3	8	37.0	7
HD 2967 (C)	38.87	5	36.5	6	37.7	6
HD 3086 (C)	37.60	8	36.3	7	37.0	8
PBW 826	39.37	3	37.6	3	38.5	3
HD 3406	39.33	4	37.0	5	38.2	4
HD 3249(C)	39.57	2	38.0	2	38.8	2
HD 2733 (C)	38.33	6	37.3	4	37.8	5
DBW 187 (C)	40.03	1	38.2	1	39.1	1
Mean	38.85		37.2		38.0	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.01	0.06	0.17	
Genotype (B)		**	0.12	0.29	0.77	
B within A		**	0.17	0.40		
A within B			0.16	0.38		
Date of Sowing	10.11.2021		14.12.2021			
Date of Harvesting	19.03.2022		11.04.2022			



Table 3.2.2. North Eastern Plains Zone			IR-TS-DOS-TAS		Coochbehar 2021-22	
Genotype	Date of Sowing		Rk	Rk	Mean	Rk
	Timely	Rk				
<b>Yield, q/ha</b>						
HD 3411	43.67	6	41.47	7	42.57	6
HD 2967 (C)	52.60	2	47.13	4	49.87	4
HD 3086 (C)	51.07	5	50.77	2	50.92	3
PBW 826	52.03	3	49.90	3	50.97	2
HD 3406	40.60	7	41.80	6	41.20	7
HD 3249(C)	40.47	8	40.23	8	40.35	8
HD 2733 (C)	54.60	1	52.13	1	53.37	1
DBW 187 (C)	51.97	4	44.47	5	48.22	5
Mean	48.38		45.99		47.18	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.39	1.59	4.00	
Genotype (B)		**	1.55	3.73	8.05	
B within A		N.S.	2.19	5.27		
A within B			2.09	5.02		
<b>Earhead/sqm</b>						
HD 3411	295	5	279	4	287	5
HD 2967 (C)	306	4	263	6	285	6
HD 3086 (C)	292	6	299	2	295	4
PBW 826	335	1	306	1	321	1
HD 3406	223	8	231	8	227	8
HD 3249(C)	248	7	238	7	243	7
HD 2733 (C)	316	3	292	3	304	2
DBW 187 (C)	319	2	278	5	298	3
Mean	292		273		282	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	7	28	12	
Genotype (B)		**	6	14	5	
B within A		*	8	20		
A within B			10	25		
<b>Grains/Earhead</b>						
HD 3411	38.79	8	38.64	8	38.71	8
HD 2967 (C)	44.61	3	46.54	1	45.57	2
HD 3086 (C)	44.61	2	43.40	5	44.00	4
PBW 826	43.00	5	42.76	6	42.88	6
HD 3406	46.16	1	45.98	2	46.07	1
HD 3249(C)	42.89	6	44.83	3	43.86	5
HD 2733 (C)	43.90	4	44.76	4	44.33	3
DBW 187 (C)	40.51	7	40.12	7	40.32	7
Mean	43.06		43.38		43.22	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	1.43	5.93	16.27	
Genotype (B)		N.S.	1.82	4.38	10.31	
B within A		N.S.	2.57	6.19		
A within B			2.80	6.74		
<b>1000 Grains Weight, g</b>						
HD 3411	38.23	6	38.43	6	38.33	6
HD 2967 (C)	38.60	5	38.47	5	38.53	5
HD 3086 (C)	39.47	3	39.13	4	39.30	4
PBW 826	36.40	8	38.13	8	37.27	8
HD 3406	39.90	2	39.33	3	39.62	3
HD 3249(C)	38.13	7	38.17	7	38.15	7
HD 2733 (C)	39.47	3	40.00	2	39.73	2
DBW 187 (C)	40.37	1	40.37	1	40.37	1
Mean	38.82		39.00		38.91	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.10	0.42	1.29	
Genotype (B)		**	0.40	0.96	2.51	
B within A		N.S.	0.56	1.36		
A within B			0.54	1.29		
Date of Sowing	15.11.2021		10.12.2021			
Date of Harvesting	31.03.2022		16.04.2022			

Table 3.2.3. North Eastern Plains Zone			IR-TS-DOS-TAS		Kalyani	2021-22
Genotype	Date of Sowing		Mean	Rk	Rk	Rk
	Timely	Late				
<b>Yield, q/ha</b>						
HD 3411	33.13	8	30.61	5	31.87	8
HD 2967 (C)	39.47	3	30.16	7	34.82	4
HD 3086 (C)	35.77	5	34.15	2	34.96	3
PBW 826	43.12	1	35.61	1	39.37	1
HD 3406	34.24	7	30.17	6	32.20	6
HD 3249(C)	36.07	4	31.28	4	33.91	5
HD 2733 (C)	40.47	2	32.28	3	36.38	2
DBW 187 (C)	34.41	6	29.38	8	31.89	7
Mean	37.09		31.76		34.43	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.76	3.14	10.82	
Genotype (B)		**	1.27	3.06	9.04	
B within A		N.S.	1.80	4.32		
A within B			1.84	4.44		
<b>Earhead/sqm</b>						
HD 3411	251	7	239	4	245	6
HD 2967 (C)	286	3	246	3	266	3
HD 3086 (C)	273	5	250	2	262	4
PBW 826	317	1	299	1	308	1
HD 3406	266	6	205	7	236	7
HD 3249(C)	278	4	236	5	257	5
HD 2733 (C)	310	2	232	6	271	2
DBW 187 (C)	249	8	205	7	227	8
Mean	279		239		259	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	5	21	10	
Genotype (B)		**	11	25	10	
B within A		N.S.	15	36		
A within B			15	36		
<b>Grains/Earhead</b>						
HD 3411	32.24	3	34.92	4	33.58	2
HD 2967 (C)	34.25	1	30.37	7	32.31	6
HD 3086 (C)	31.53	5	32.61	6	32.07	7
PBW 826	31.38	6	28.79	8	30.09	8
HD 3406	30.16	8	36.28	2	33.22	5
HD 3249(C)	31.66	4	34.79	5	33.23	4
HD 2733 (C)	31.02	7	35.48	3	33.25	3
DBW 187 (C)	33.39	2	37.21	1	35.30	1
Mean	31.95		33.80		32.88	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.38	1.59	5.72	
Genotype (B)		N.S.	1.36	3.27	10.12	
B within A		N.S.	1.92	4.62		
A within B			1.84	4.42		
<b>1000 Grains Weight, g</b>						
HD 3411	41.20	6	37.23	8	39.22	8
HD 2967 (C)	40.60	8	41.17	3	40.88	4
HD 3086 (C)	41.53	4	42.50	1	42.02	2
PBW 826	43.30	1	41.67	2	42.48	1
HD 3406	42.83	2	40.50	4	41.67	3
HD 3249(C)	41.17	7	38.83	6	40.00	6
HD 2733 (C)	42.17	3	39.33	5	40.75	5
DBW 187 (C)	41.50	5	38.37	7	39.93	7
Mean	41.79		39.95		40.87	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.53	2.20	6.40	
Genotype (B)		N.S.	1.09	2.63	6.56	
B within A		N.S.	1.55	3.72		
A within B			1.54	3.71		
Date of Sowing	08.11.2021		15.12.2021			
Date of Harvesting	21.03.2022		30.03.2022			

Table 3.2.4. North Eastern Plains Zone			IR-TS-DOS-TAS		Kanpur	2021-22
Genotype	Date of Sowing		Mean	Rk	Mean	Rk
	Timely	Rk				
<b>Yield, q/ha</b>						
HD 3411	38.82	4	21.36	5	30.09	5
HD 2967 (C)	34.28	8	23.73	4	29.01	7
HD 3086 (C)	42.20	2	29.01	1	35.60	2
PBW 826	34.29	7	26.63	3	30.46	3
HD 3406	42.20	2	18.45	7	30.33	4
HD 3249(C)	46.02	1	28.74	2	37.38	1
HD 2733 (C)	36.92	6	18.29	8	27.61	8
DBW 187 (C)	38.37	5	21.10	6	29.73	6
Mean	39.14		23.42		31.28	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.62	2.55	9.66	
Genotype (B)		**	0.81	1.96	6.38	
B within A		**	1.15	2.77		
A within B			1.24	1.99		
<b>Earhead/sq m</b>						
HD 3411	450	6	370	4	413	6
HD 2967 (C)	490	4	475	2	482	2
HD 3086 (C)	499	3	550	1	525	1
PBW 826	527	2	401	3	464	3
HD 3406	388	8	361	8	374	8
HD 3249(C)	418	7	374	5	396	7
HD 2733 (C)	507	5	364	7	425	5
DBW 187 (C)	508	2	373	6	440	4
Mean	471		409		440	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	9	38	10	
Genotype (B)		**	5	12	3	
B within A		**	7	16		
A within B			11	27		
<b>Grains/Earhead</b>						
HD 3411	28.86	2	15.74	6	22.30	4
HD 2967 (C)	26.52	5	21.45	2	23.98	2
HD 3086 (C)	28.08	3	18.36	3	23.22	3
PBW 826	15.12	8	17.05	4	16.08	8
HD 3406	28.00	4	14.84	7	21.42	5
HD 3249(C)	38.84	1	24.64	1	31.74	1
HD 2733 (C)	19.60	6	13.29	8	16.45	7
DBW 187 (C)	19.18	7	16.47	5	17.82	6
Mean	25.53		17.73		21.63	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.71	2.92	16.04	
Genotype (B)		**	0.77	1.84	8.67	
B within A		**	1.08	2.60		
A within B			1.24	2.97		
<b>1000 Grains Weight, g</b>						
HD 3411	30.03	6	36.20	3	33.12	5
HD 2967 (C)	26.40	8	23.33	8	24.87	8
HD 3086 (C)	30.17	5	28.80	7	29.48	7
PBW 826	43.13	1	39.13	1	41.13	1
HD 3406	39.10	3	34.60	4	36.85	4
HD 3249(C)	28.43	7	31.23	6	29.83	6
HD 2733 (C)	39.00	4	37.80	2	38.40	2
DBW 187 (C)	39.60	2	34.47	5	37.03	3
Mean	34.48		33.20		33.84	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.12	0.50	1.74	
Genotype (B)		**	0.68	1.63	4.89	
B within A		**	0.96	2.30		
A within B			0.90	2.17		
Date of Sowing	11.11.2021		16.12.2021			
Date of Harvesting	24.04.2022		05.05.2022			

Table 3.2.5. North Eastern Plains Zone			IR-TS-DOS-TAS		Ranchi	2021-22
Genotype	Date of Sowing		Rk	Rk	Mean	Rk
	Timely					
<b>Yield, q/ha</b>						
HD 3411	54.16	6	47.76	5	50.96	5
HD 2967 (C)	62.61	1	53.66	2	58.14	1
HD 3086 (C)	49.22	7	39.57	8	44.39	7
PBW 826	60.85	4	48.46	4	54.66	4
HD 3406	61.00	3	53.87	1	57.43	2
HD 3249(C)	48.40	8	40.04	7	44.22	8
HD 2733 (C)	62.47	2	49.17	3	55.82	3
DBW 187 (C)	56.77	5	42.33	6	49.55	6
Mean	56.94		46.86		51.90	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	1.26	5.20	11.90	
Genotype (B)		**	1.98	4.77	9.35	
B within A		N.S.	2.80	6.74		
A within B			2.91	7.00		
<b>Earhead/sqm</b>						
HD 3411	383	5	345	5	364	5
HD 2967 (C)	423	2	358	2	391	3
HD 3086 (C)	360	7	303	8	332	7
PBW 826	385	4	351	3	368	4
HD 3406	400	3	392	1	396	2
HD 3249(C)	327	8	328	7	328	8
HD 2733 (C)	457	1	350	4	403	1
DBW 187 (C)	370	6	330	6	350	6
Mean	388		345		366	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	12	51	17	
Genotype (B)		**	12	30	8	
B within A		N.S.	17	42		
A within B			20	49		
<b>Grains/Earhead</b>						
HD 3411	31.17	7	32.56	5	31.86	7
HD 2967 (C)	32.67	5	35.06	1	33.87	2
HD 3086 (C)	31.33	6	32.65	4	31.99	6
PBW 826	35.15	1	34.75	2	34.95	1
HD 3406	33.40	4	31.94	6	32.67	4
HD 3249(C)	34.74	2	30.14	8	32.44	5
HD 2733 (C)	29.55	8	33.77	3	31.66	8
DBW 187 (C)	34.49	3	31.58	7	33.04	3
Mean	32.81		32.81		32.81	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	1.50	6.20	22.41	
Genotype (B)		N.S.	1.59	3.82	11.86	
B within A		N.S.	2.25	5.41		
A within B			2.58	6.21		
<b>1000 Grains Weight, g</b>						
HD 3411	45.30	4	42.66	3	43.98	4
HD 2967 (C)	45.37	3	43.07	2	44.22	2
HD 3086 (C)	43.59	7	40.20	8	41.90	7
PBW 826	45.18	5	40.47	7	42.82	5
HD 3406	45.81	2	43.73	1	44.77	1
HD 3249(C)	42.66	8	40.69	5	41.68	8
HD 2733 (C)	46.29	1	42.06	4	44.18	3
DBW 187 (C)	45.00	6	40.57	6	42.78	6
Mean	44.90		41.68		43.29	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.53	2.17	5.94	
Genotype (B)		*	0.73	1.77	4.16	
B within A		N.S.	1.04	2.50		
A within B			1.10	2.66		
Date of Sowing	08.11.2021		06.12.2021			
Date of Harvesting	15.03.2022		15.04.2022			

Table 3.2.6. North Eastern Plains Zone			IR-TS-DOS-TAS		RPCAU PUSA/ 2021-22	
Genotype	Date of Sowing		Mean	Rk	Rk	Rk
	Timely	Late				
<b>Yield, q/ha</b>						
HD 3411	30.50	8	23.90	5	27.2	6
HD 2967 (C)	32.20	7	14.80	8	23.50	8
HD 3086 (C)	33.30	5	31.50	3	32.40	4
PBW 826	49.70	2	34.20	2	41.95	2
HD 3406	42.20	4	27.80	6	31.50	5
HD 3249(C)	48.70	3	26.30	4	37.50	3
HD 2733 (C)	32.60	6	16.50	7	24.55	7
DBW 187 (C)	50.83	1	40.60	1	45.72	1
Mean	40.00		26.08		33.04	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.78	3.21	11.52	
Genotype (B)		**	0.81	1.96	6.03	
B within A		**	1.15	2.77		
A within B			1.33	3.19		
<b>Earhead/sqm</b>						
HD 3411	219	8	216	2	218	8
HD 2967 (C)	232	7	205	7	219	7
HD 3086 (C)	245	5	210	5	228	5
PBW 826	264	1	214	3	239	1
HD 3406	248	4	211	4	229	4
HD 3249(C)	255	2	210	6	233	3
HD 2733 (C)	237	6	205	8	221	6
DBW 187 (C)	254	3	221	1	237	2
Mean	244		211		228	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	1	6	3	
Genotype (B)		N.S.	5	13	6	
B within A		N.S.	8	19		
A within B			7	18		
<b>Grains/Earhead</b>						
HD 3411	34.94	6	29.03	5	31.98	6
HD 2967 (C)	37.60	5	21.44	8	29.52	7
HD 3086 (C)	32.83	8	39.77	3	36.30	4
PBW 826	44.10	3	40.01	2	42.05	2
HD 3406	43.44	4	29.00	6	36.22	5
HD 3249(C)	44.78	2	32.33	4	38.55	3
HD 2733 (C)	34.26	7	22.48	7	28.37	8
DBW 187 (C)	47.09	1	47.39	1	47.24	1
Mean	39.88		32.68		36.28	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.31	1.28	4.20	
Genotype (B)		**	1.52	3.65	10.23	
B within A		**	2.14	5.15		
A within B			2.03	4.88		
<b>1000 Grains Weight, g</b>						
HD 3411	40.00	6	38.15	4	39.08	5
HD 2967 (C)	36.90	8	33.63	8	35.27	8
HD 3086 (C)	41.40	4	37.78	5	39.59	4
PBW 826	42.85	1	40.13	1	41.49	1
HD 3406	39.60	7	34.05	7	36.83	7
HD 3249(C)	42.75	3	38.90	2	40.83	2
HD 2733 (C)	40.50	5	36.32	6	38.41	6
DBW 187 (C)	42.76	2	38.80	3	40.78	3
Mean	40.84		37.22		39.03	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.46	1.89	5.75	
Genotype (B)		**	0.98	2.35	6.12	
B within A		N.S.	1.38	3.32		
A within B			1.37	3.29		
Date of Sowing	16.11.2021		15.12.2021			
Date of Harvesting	-		06.04.2021			

Table 3.2.7. North Eastern Plains Zone			IR-TS-DOS-TAS		Sabour	2021-22
Genotype	Date of Sowing		Mean	Rk	Mean	Rk
	Timely	Rk				
<b>Yield, q/ha</b>						
HD 3411	47.69	2	35.02	4	41.35	4
HD 2967 (C)	40.87	6	29.98	8	35.42	7
HD 3086 (C)	47.17	3	41.00	2	44.09	1
PBW 826	44.22	4	39.18	2	41.70	3
HD 3406	42.55	5	34.33	5	38.44	5
HD 3249(C)	40.52	7	33.46	6	36.99	6
HD 2733 (C)	36.36	8	32.56	7	34.46	8
DBW 187 (C)	49.23	1	37.34	3	43.29	2
Mean	43.57		35.36		39.47	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	1.30	5.37	16.14	
Genotype (B)		*	2.14	5.15	13.30	
B within A		N.S.	3.03	7.29		
A within B			3.12	7.50		
<b>Earhead/sqm</b>						
HD 3411	362	3	348	1	355	1
HD 2967 (C)	333	7	283	8	308	7
HD 3086 (C)	378	2	322	2	350	2
PBW 826	350	6	315	3	333	4
HD 3406	355	5	302	5	328	5
HD 3249(C)	357	4	298	6	327	6
HD 2733 (C)	312	8	295	7	303	8
DBW 187 (C)	392	1	307	4	349	3
Mean	355		309		332	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	9	37	13	
Genotype (B)		N.S.	21	51	16	
B within A		N.S.	30	73		
A within B			30	71		
<b>Grains/Earhead</b>						
HD 3411	31.42	1	25.21	8	28.32	7
HD 2967 (C)	30.51	3	27.03	7	28.77	6
HD 3086 (C)	29.71	6	31.85	1	30.78	2
PBW 826	31.16	2	30.99	2	31.07	1
HD 3406	30.01	5	28.12	4	29.06	4
HD 3249(C)	29.49	7	28.07	5	28.78	5
HD 2733 (C)	27.83	8	27.29	6	27.56	8
DBW 187 (C)	30.05	4	30.12	3	30.09	3
Mean	30.02		28.59		29.30	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.90	3.70	14.97	
Genotype (B)		N.S.	2.40	5.78	20.10	
B within A		N.S.	3.40	8.18		
A within B			3.30	7.95		
<b>1000 Grains Weight, g</b>						
HD 3411	42.33	3	40.82	2	41.58	3
HD 2967 (C)	40.79	7	40.04	8	40.41	8
HD 3086 (C)	42.28	4	40.04	7	41.16	4
PBW 826	40.81	6	40.33	4	40.57	6
HD 3406	40.67	8	40.22	5	40.45	7
HD 3249(C)	41.05	5	40.13	6	40.59	5
HD 2733 (C)	42.61	2	40.82	2	41.72	2
DBW 187 (C)	43.33	1	41.00	1	42.16	1
Mean	41.73		40.43		41.08	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.75	3.11	8.99	
Genotype (B)		N.S.	1.03	2.47	6.13	
B within A		N.S.	1.45	3.49		
A within B			1.55	3.74		
Date of Sowing	11.11.2021		16.12.2021			
Date of Harvesting	05.04.2022		08.04.2022			

Table 3.2.8. North Eastern Plains Zone			IR-TS-DOS-TAS		Shillongani	2021-22
Genotype	Date of Sowing		Rk	Rk	Mean	Rk
	Timely					
<b>Yield, q/ha</b>						
HD 3411	42.66	4	40.52	6	41.59	4
HD 2967 (C)	38.00	8	36.77	8	37.39	8
HD 3086 (C)	41.61	5	41.09	4	41.35	5
PBW 826	40.58	6	40.91	5	40.75	6
HD 3406	39.89	7	38.23	7	39.06	7
HD 3249(C)	42.97	3	41.90	3	42.44	3
HD 2733 (C)	44.87	2	42.53	2	43.70	2
DBW 187 (C)	46.98	1	45.24	1	46.11	1
Mean	42.20		40.90		41.55	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.14	0.57	1.63	
Genotype (B)		**	0.68	1.64	4.01	
B within A		N.S.	0.96	2.32		
A within B			0.91	2.19		
<b>Earhead/sqm</b>						
HD 3411	174	8	273	1	224	4
HD 2967 (C)	253	1	257	3	255	1
HD 3086 (C)	178	6	245	4	211	6
PBW 826	184	5	225	7	204	7
HD 3406	204	4	237	6	220	5
HD 3249(C)	178	6	223	8	201	8
HD 2733 (C)	204	3	265	2	235	2
DBW 187 (C)	206	2	243	5	224	3
Mean	198		246		222	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	1	3	2	
Genotype (B)		**	6	15	7	
B within A		**	9	22		
A within B			9	21		
<b>Grains/Earhead</b>						
HD 3411	51.27	1	30.65	8	40.96	5
HD 2967 (C)	38.53	8	36.97	3	37.75	7
HD 3086 (C)	49.75	2	36.40	5	43.08	2
PBW 826	48.22	3	40.48	1	44.35	1
HD 3406	45.36	5	36.91	4	41.14	4
HD 3249(C)	47.40	4	37.94	2	42.67	3
HD 2733 (C)	41.95	7	31.48	7	36.72	8
DBW 187 (C)	43.21	6	34.77	6	38.99	6
Mean	45.71		35.70		40.71	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.66	2.74	7.98	
Genotype (B)		N.S.	1.97	4.74	11.85	
B within A		N.S.	2.79	6.70		
A within B			2.69	6.47		
<b>1000 Grains Weight, g</b>						
HD 3411	48.11	4	48.38	4	48.25	4
HD 2967 (C)	40.96	8	38.71	8	39.83	8
HD 3086 (C)	47.71	5	46.28	5	47.00	5
PBW 826	46.01	6	45.31	6	45.66	6
HD 3406	43.27	7	43.83	7	43.55	7
HD 3249(C)	51.07	3	49.56	3	50.32	3
HD 2733 (C)	52.49	2	51.09	2	51.79	2
DBW 187 (C)	53.36	1	53.62	1	53.49	1
Mean	47.87		47.10		47.49	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.45	1.85	4.61	
Genotype (B)		**	1.14	2.74	5.89	
B within A		N.S.	1.61	3.88		
A within B			1.57	3.79		
Date of Sowing	05.11.2021		10.12.2021			
Date of Harvesting	31.03.2022		16.04.2022			

Table 3.2.9. North Eastern Plains Zone			IR-TS-DOS-TAS		Varanasi	2021-22
Genotype	Date of Sowing				Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HD 3411	47.08	6	41.09	6	44.08	6
HD 2967 (C)	45.49	7	32.44	8	38.97	8
HD 3086 (C)	44.41	8	46.91	4	45.66	5
PBW 826	51.86	3	49.72	1	50.79	1
HD 3406	49.72	4	34.25	7	41.98	7
HD 3249(C)	52.49	2	48.57	2	50.53	2
HD 2733 (C)	53.31	1	44.49	5	48.90	3
DBW 187 (C)	47.96	5	47.33	3	47.65	4
Mean	49.04		43.10		46.07	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.62	2.56	6.59	
Genotype (B)		**	0.82	1.96	4.34	
B within A		**	1.15	2.78		
A within B			1.25	3.00		
<b>Earhead/sqm</b>						
HD 3411	380	2	460	1	420	1
HD 2967 (C)	376	3	368	4	372	4
HD 3086 (C)	434	1	369	3	402	2
PBW 826	331	6	287	8	309	7
HD 3406	308	7	312	7	310	6
HD 3249(C)	349	4	320	6	335	5
HD 2733 (C)	342	5	423	2	382	3
DBW 187 (C)	267	8	324	5	295	8
Mean	348		358		353	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	2	9	3	
Genotype (B)		**	10	24	7	
B within A		**	14	34		
A within B			13	32		
<b>Grains/Earhead</b>						
HD 3411	30.10	6	28.81	8	29.45	8
HD 2967 (C)	33.87	4	34.29	5	34.08	4
HD 3086 (C)	24.50	8	36.80	3	30.65	7
PBW 826	31.35	5	39.27	2	35.31	2
HD 3406	42.04	1	42.78	1	42.41	1
HD 3249(C)	29.33	7	32.47	6	30.90	6
HD 2733 (C)	35.36	2	30.89	7	33.13	5
DBW 187 (C)	35.36	3	35.24	4	35.30	3
Mean	32.74		35.07		33.90	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.67	2.75	9.62	
Genotype (B)		**	1.33	3.21	9.64	
B within A		**	1.89	4.54		
A within B			1.89	4.54		
<b>1000 Grains Weight, g</b>						
HD 3411	41.12	6	31.11	6	36.12	6
HD 2967 (C)	35.85	8	25.77	8	30.81	8
HD 3086 (C)	42.25	5	34.77	4	38.51	5
PBW 826	50.24	3	44.23	2	47.23	2
HD 3406	38.48	7	25.86	7	32.17	7
HD 3249(C)	51.50	1	46.96	1	49.23	1
HD 2733 (C)	44.19	4	34.58	5	39.39	4
DBW 187 (C)	50.99	2	41.60	3	46.30	3
Mean	44.33		35.61		39.97	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.61	2.54	7.53	
Genotype (B)		**	0.76	1.83	4.66	
B within A		*	1.08	2.59		
A within B			1.18	2.84		
Date of Sowing	10.11.2021		10.12.2021			
Date of Harvesting	05.04.2022		09.04.2022			



Table 3.4.1. North Eastern Plains Zone		IR-LS-DOS-TAS			Ayodhya	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	40.31	6	32.54	7	36.43	7
HI1563(c)	42.69	4	33.73	4	38.21	4
PBW833	39.92	7	33.15	6	36.54	6
HI1621(c)	44.86	2	35.71	2	40.29	2
HD3118 (c)	44.28	3	34.92	3	39.60	3
PBW835	45.47	1	35.90	1	40.69	1
DBW107(c)	42.10	5	33.21	5	37.65	5
Mean	42.80		34.17		38.49	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.14	0.56	1.63	
Genotype (B)		**	0.41	0.99	2.61	
B within A		N.S.	0.58	1.40		
A within B			0.55	1.34		
<b>Earhead/sqm</b>						
DBW316	491	5	480	7	486	6
HI1563(c)	525	3	482	6	504	4
PBW833	488	6	493	4	490	5
HI1621(c)	523	4	503	3	513	3
HD3118(c)	552	1	524	1	538	1
PBW835	552	2	518	2	535	2
DBW107(c)	485	7	483	5	484	7
Mean	517		498		507	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	2	6	1	
Genotype (B)		**	5	12	2	
B within A		*	7	17		
A within B			7	17		
<b>Grains/Earhead</b>						
DBW316	22.68	5	19.80	6	21.24	6
HI1563(c)	22.73	4	21.10	1	21.91	2
PBW833	23.04	3	20.28	3	21.66	4
HI1621(c)	23.82	1	21.02	2	22.42	1
HD3118(c)	22.56	6	19.99	5	21.27	5
PBW835	22.07	7	19.68	7	20.88	7
DBW107(c)	23.68	2	20.04	4	21.86	3
Mean	22.94		20.27		21.61	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.12	0.48	2.49	
Genotype (B)		*	0.32	0.77	3.62	
B within A		N.S.	0.45	1.09		
A within B			0.43	1.05		
<b>1000 Grains Weight, g</b>						
DBW316	36.23	3	34.23	3	35.23	3
HI1563(c)	35.77	5	33.20	6	34.48	5
PBW833	35.53	6	33.17	7	34.35	7
HI1621(c)	36.00	4	33.80	4	34.90	4
HD3118(c)	35.53	6	33.33	5	34.43	6
PBW835	37.37	1	35.27	1	36.32	1
DBW107(c)	36.67	2	34.30	2	35.48	2
Mean	36.16		33.90		35.03	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		0	0	0	0	
Genotype (B)		**	0.11	0.27	0.78	
B within A		N.S.	0.16	0.38		
A within B			0.15	0.35		
Date of Sowing	16.12.2021		03.01.2022			
Date of Harvesting	04.03.2022		18.04.2022			

Table 3.4.2. North Eastern Plains Zone		IR-LS-DOS-TAS			Coochbehar	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	36.57	6	19.73	3	28.15	6
HI1563(c)	40.57	4	22.33	1	31.45	3
PBW833	40.53	5	18.50	7	29.52	5
HI1621(c)	35.20	7	18.93	6	27.07	7
HD3118(c)	46.00	1	19.23	5	32.62	2
PBW835	44.70	2	21.77	2	33.23	1
DBW107(c)	43.20	3	19.33	4	31.27	4
Mean	40.97		19.98		30.47	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.33	1.36	5.00	
Genotype (B)		**	1.05	2.54	8.45	
B within A		*	1.49	3.60		
A within B			1.42	3.43		
<b>Earhead/sqm</b>						
DBW316	231	6	196	5	213	6
HI1563(c)	268	3	212	3	240	3
PBW833	234	5	194	6	214	5
HI1621(c)	219	7	190	7	204	7
HD3118(c)	281	2	218	2	250	2
PBW835	288	1	220	1	254	1
DBW107(c)	263	4	201	4	232	4
Mean	255		205		230	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	1	5	3	
Genotype (B)		**	6	14	6	
B within A		N.S.	8	20		
A within B			8	19		
<b>Grains/Earhead</b>						
DBW316	40.28	5	27.34	4	33.81	6
HI1563(c)	38.57	7	29.24	1	33.90	5
PBW833	43.15	1	26.23	6	34.69	4
HI1621(c)	41.88	2	27.95	2	34.91	8
HD3118(c)	40.94	4	25.02	7	32.98	7
PBW835	38.65	6	27.62	3	33.13	2
DBW107(c)	41.83	3	27.09	5	34.46	1
Mean	40.76		27.21		33.99	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.37	1.53	5.04	
Genotype (B)		N.S.	1.58	3.81	11.36	
B within A		N.S.	2.23	5.39		
A within B			2.10	5.07		
<b>1000 Grains Weight, g</b>						
DBW316	39.40	4	36.90	1	38.15	2
HI1563(c)	39.37	5	36.03	3	37.70	4
PBW833	40.27	1	36.77	2	38.52	1
HI1621(c)	39.00	7	35.73	5	37.37	7
HD3118(c)	40.07	3	35.30	7	37.68	5
PBW835	40.23	2	35.87	4	38.05	3
DBW107(c)	39.23	6	35.63	6	37.43	6
Mean	39.65		36.03		37.84	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.10	0.40	1.17	
Genotype (B)		N.S.	0.31	0.74	1.99	
B within A		N.S.	0.43	1.05		
A within B			0.41	1.00		
Date of Sowing	15.11.2021		10.12.2021			
Date of Harvesting	31.03.2022		16.04.2022			

Table 3.4.3. North Eastern Plains Zone		IR-LS-DOS-TAS			Kalyani	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	27.66	5	24.74	2	26.20	4
HI1563(c)	34.02	1	27.16	1	30.59	1
PBW833	33.03	2	23.58	4	28.30	2
HI1621(c)	26.70	6	20.40	7	23.55	6
HD3118(c)	24.83	7	21.17	6	23.00	7
PBW835	30.48	3	24.32	3	27.40	3
DBW107(c)	28.11	4	22.00	5	25.06	5
Mean	29.26		23.34		26.30	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.38	1.57	6.65	
Genotype (B)		**	0.79	1.92	7.37	
B within A		N.S.	1.12	2.71		
A within B			1.10	2.67		
<b>Earhead/sqm</b>						
DBW316	254	4	252	2	253	4
HI1563(c)	312	1	253	1	283	1
PBW833	298	2	246	3	272	2
HI1621(c)	238	6	214	7	226	7
HD3118(c)	223	7	235	6	229	6
PBW835	275	3	238	5	257	3
DBW107(c)	248	5	244	4	246	5
Mean	264		240		252	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	2	7	3	
Genotype (B)		**	9	21	9	
B within A		N.S.	12	30		
A within B			12	28		
<b>Grains/Earhead</b>						
DBW316	28.56	5	25.97	4	27.26	5
HI1563(c)	26.97	7	27.62	1	27.29	4
PBW833	27.77	6	25.37	5	26.57	6
HI1621(c)	29.35	2	25.98	3	27.67	3
HD3118 ( c )	29.02	4	23.96	7	26.49	7
PBW835	29.15	3	26.24	2	27.69	2
DBW107(c)	30.67	1	24.74	6	27.71	1
Mean	28.78		25.70		27.24	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)	(A)	*	0.32	1.31	5.36	
Genotype (B)	(B)	N.S.	1.30	3.14	11.66	
B within A		N.S.	1.83	4.44		
A within B			1.73	4.18		
<b>1000 Grains Weight, g</b>						
DBW316	38.49	4	37.95	3	38.22	4
HI1563(c)	40.48	1	38.97	2	39.73	1
PBW833	40.38	2	37.68	4	39.03	2
HI1621(c)	38.84	3	36.81	6	37.82	6
HD3118(c)	38.34	5	37.60	5	37.97	5
PBW835	38.34	6	39.31	1	38.82	3
DBW107(c)	37.36	7	36.46	7	36.91	7
Mean	38.89		37.82		38.36	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.27	1.11	3.23	
Genotype (B)		N.S.	0.72	1.73	4.57	
B within A		N.S.	1.01	2.45		
A within B			0.98	2.36		
Date of Sowing	15.12.2021		06.01.2022			
Date of Harvesting	02.05.2022		11.05.2022			

Table 3.4.4. North Eastern Plains Zone		IR-LS-DOS-TAS			Kanpur	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	34.14	4	20.13	1	27.14	1
HI1563(c)	32.14	5	15.97	7	24.06	7
PBW833	34.14	3	23.60	2	28.87	2
HI1621(c)	34.72	2	20.60	3	27.66	3
HD3118(c)	35.87	1	17.35	6	26.61	4
PBW835	30.08	7	19.21	4	24.65	5
DBW107(c)	30.55	6	18.05	5	24.30	6
Mean	33.09		19.77		26.18	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.				
Genotype (B)		N.S.				
B within A		N.S.				
A within B						
<b>Earhead/sqm</b>						
DBW316	421	7	451	5	436	<b>6</b>
HI1563(c)	447	4	406	7	426	7
PBW833	437	6	461	1	449	4
HI1621(c)	465	1	457	3	461	1
HD3118(c)	454	3	455	4	455	3
PBW835	462	2	460	2	461	1
DBW107(c)	443	5	449	6	446	5
Mean	447		448		448	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)	(A)	N.S.	1	2	1	
Genotype (B)	(B)	*	8	18	4	
B within A		N.S.	11	26		
A within B			10	24		
<b>Grains/Earhead</b>						
DBW316	23.53	1	14.76	1	19.14	1
HI1563(c)	20.75	6	14.22	7	17.49	7
PBW833	22.94	3	18.38	2	20.66	2
HI1621(c)	21.09	4	16.94	3	19.02	3
HD3118(c)	23.01	2	14.41	6	18.71	4
PBW835	19.39	7	15.65	4	17.52	6
DBW107(c)	21.00	5	15.50	5	18.25	<b>5</b>
Mean	21.67		15.70		18.68	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.				
Genotype (B)		N.S.				
B within A		N.S.				
A within B						
<b>1000 Grains Weight, g</b>						
DBW316	34.50	3	30.27	1.00	32.38	1
HI1563(c)	34.70	2	27.67	3.00	31.18	2
PBW833	34.03	5	28.07	2.00	31.05	4
HI1621(c)	35.57	1	26.60	5.00	31.08	3
HD3118(c)	34.33	4	26.57	6	30.45	5
PBW835	33.58	6	26.73	4	30.16	6
DBW107(c)	32.83	7	25.97	7	29.40	<b>7</b>
Mean	34.22		27.41		30.82	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.11	0.45	1.62	
Genotype (B)		**	0.22	0.53	1.75	
B within A		**	0.31	0.76		
A within B			0.31	0.75		
Date of Sowing	15.12.2021		04.01.2022			
Date of Harvesting	01.05.2022		10.05.2022			

Table 3.4.5. North Eastern Plains Zone IR-LS-DOS-TAS					Ranchi	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	45.95	6	37.86	2	41.90	4
HI1563(c)	47.97	2	37.19	3	42.58	2
PBW833	46.85	4	36.53	6	41.69	6
HI1621(c)	51.80	1	41.69	1	46.74	1
HD3118(c)	46.85	4	36.73	5	41.79	5
PBW835	44.14	7	36.18	7	40.16	7
DBW107(c)	47.97	2	36.77	4	42.37	3
Mean	47.36		37.56		42.46	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	1.22	5.00	13.15	
Genotype (B)		N.S.	1.45	3.52	8.39	
B within A		N.S.	2.06	4.98		
A within B			2.26	5.47		
<b>Earhead/sqm</b>						
DBW316	363	5	325	4	344	5
HI1563(c)	370	4	338	1	354	2
PBW833	340	6	303	7	322	6
HI1621(c)	398	1	334	2	366	1
HD3118(c)	380	2	318	5	349	4
PBW835	307	7	305	6	306	7
DBW107(c)	373	3	327	3	350	3
Mean	362		322		342	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	5	22	7	
Genotype (B)		*	12	29	9	
B within A		N.S.	17	41		
A within B			17	40		
<b>Grains/Earhead</b>						
DBW316	29.91	4	29.12	5	29.51	4
HI1563(c)	29.40	5	27.85	7	28.62	7
PBW833	32.64	2	31.16	1	31.90	2
HI1621(c)	28.56	6	31.05	2	29.81	3
HD3118(c)	28.18	7	29.60	4	28.89	6
PBW835	34.81	1	30.24	3	32.53	1
DBW107(c)	30.28	3	28.32	6	29.30	5
Mean	30.54		29.62		30.08	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.61	2.51	9.31	
Genotype (B)		N.S.	1.81	4.37	14.72	
B within A		N.S.	2.56	6.19		
A within B			2.44	5.92		
<b>1000 Grains Weight, g</b>						
DBW316	42.67	5	40.07	2	41.37	5
HI1563(c)	44.40	2	39.87	3	42.13	2
PBW833	42.46	6	39.40	7	40.93	6
HI1621(c)	45.59	1	40.20	1	42.89	1
HD3118(c)	43.79	3	39.50	6	41.64	3
PBW835	41.60	7	39.87	3	40.73	7
DBW107(c)	43.13	4	39.80	5	41.47	4
Mean	43.38		39.81		41.60	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.12	0.48	1.30	
Genotype (B)		N.S.	0.76	1.84	4.47	
B within A		N.S.	1.07	2.60		
A within B			1.00	2.42		
Date of Sowing	01.12.2021		02.01.2022			
Date of Harvesting	10.04.2022		02.05.2022			

Table 3.4.6. North Eastern Plains Zone		IR-LS-DOS-TAS			RPCAU PUSA	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	19.63	6	17.27	6	18.45	6
HI1563(c)	21.65	5	18.97	4	20.31	5
PBW833	25.14	3	21.51	3	23.33	3
HI1621(c)	25.26	2	21.66	2	23.46	2
HD3118(c)	22.19	4	18.57	5	20.38	4
PBW835	19.29	7	17.85	7	15.32	7
DBW107(c)	29.19	1	22.14	1	25.67	1
Mean	23.19		18.78		20.99	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.56	2.30	12.22	
Genotype (B)		**	0.42	1.01	4.88	
B within A		**	0.59	1.43		
A within B			0.78	1.89		
<b>Earhead/sqm</b>						
DBW316	172	7	162	7	167	7
HI1563(c)	209	4	178	4	194	4
PBW833	215	2	200	1	207	1
HI1621(c)	222	1	187	2	204	2
HD3118(c)	212	3	180	3	196	3
PBW835	191	6	168	6	180	6
DBW107(c)	206	5	177	5	192	5
Mean	204		179		191	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	1	5	3	
Genotype (B)		**	3	7	4	
B within A		*	4	10		
A within B			4	10		
<b>Grains/Earhead</b>						
DBW316	30.04	2	30.41	4	30.22	4
HI1563(c)	25.96	6	35.07	1	30.51	3
PBW833	28.36	4	28.96	6	28.66	5
HI1621(c)	28.70	3	34.41	2	31.56	2
HD3118(c)	26.26	5	28.97	5	27.61	6
PBW835	25.56	7	22.87	7	24.21	7
DBW107(c)	33.51	1	33.06	3	33.29	1
Mean	28.34		30.54		29.44	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.45	1.8	7.00	
Genotype (B)		**	0.82	2.0	6.79	
B within A		**	1.15	2.8		
A within B			1.16	2.8		
<b>1000 Grains Weight, g</b>						
DBW316	38.00	7	35.00	4	36.50	5
HI1563(c)	39.90	3	30.40	6	35.15	6
PBW833	41.49	2	37.20	2	39.35	2
HI1621(c)	39.62	5	33.81	5	36.71	4
HD3118(c)	39.90	3	35.72	3	37.81	3
PBW835	39.60	6	29.60	7	34.60	7
DBW107(c)	42.32	1	38.00	1	40.16	1
Mean	40.12		34.25		37.18	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.42	1.72	5.15	
Genotype (B)		**	0.69	1.68	4.57	
B within A		**	0.98	2.37		
A within B			1.00	2.42		
Date of Sowing	16.12.2021		03.01.2022			
Date of Harvesting	18.04.2022		25.04.2022			

Table 3.4.7. North Eastern Plains Zone		IR-LS-DOS-TAS			Sabour	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	36.26	2	23.89	2	30.07	1
HI1563(c)	32.33	6	20.52	5	26.42	7
PBW833	31.41	7	23.06	3	27.24	6
HI1621(c)	35.33	4	19.34	6	27.33	5
HD3118(c)	32.48	5	23.97	1	28.22	3
PBW835	39.23	1	19.24	7	29.24	2
DBW107(c)	35.58	3	20.78	4	28.18	4
Mean	34.66		21.54		28.10	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.94	3.84	15.27	
Genotype (B)		N.S.	1.80	4.34	15.65	
B within A		N.S.	2.54	6.14		
A within B			2.53	6.12		
<b>Earhead/sqm</b>						
DBW316	275	2	233	3	254	2
HI1563(c)	245	7	212	7	228	7
PBW833	252	5	216	5	234	5
HI1621(c)	262	4	235	2	249	3
HD3118(c)	250	6	214	6	232	6
PBW835	280	1	241	1	261	1
DBW107(c)	263	3	221	4	242	4
Mean	261		225		243	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	13	52	24	
Genotype (B)		N.S.	14	33	14	
B within A		N.S.	19	47		
A within B			22	53		
<b>Grains/Earhead</b>						
DBW316	35.11	5	36.32	2	35.71	2
HI1563(c)	36.38	2	30.85	4	33.61	3
PBW833	32.09	7	34.00	3	33.05	5
HI1621(c)	36.86	1	26.64	6	31.75	6
HD3118(c)	34.57	6	37.03	1	35.80	1
PBW835	35.97	4	25.39	7	30.68	7
DBW107(c)	35.98	3	30.77	5	33.37	4
Mean	35.28		31.57		33.43	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)	(A)	N.S.	0.91	3.72	12.44	
Genotype (B)	(B)	N.S.	2.80	6.76	20.48	
B within A		N.S.	3.95	9.57		
A within B			3.77	9.12		
<b>1000 Grains Weight, g</b>						
DBW316	37.78	5	28.37	7	33.08	7
HI1563(c)	37.56	6	31.47	3	34.52	4
PBW833	39.26	1	32.19	1	35.73	1
HI1621(c)	37.42	7	31.41	4	34.42	5
HD3118(c)	38.02	4	30.53	6	34.28	6
PBW835	39.05	2	31.67	2	35.36	2
DBW107(c)	38.22	3	31.17	5	34.70	3
Mean	38.19		30.97		34.58	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.62	2.53	8.18	
Genotype (B)		N.S.	1.09	2.64	7.74	
B within A		N.S.	1.55	3.74		
A within B			1.56	3.77		
Date of Sowing	16.12.2021		07.01.2022			
Date of Harvesting	25.04.2022		30.04.2022			

Table 3.4.8. North Eastern Plains Zone		IR-LS-DOS-TAS			Shillongani	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	42.19	4	41.71	4	41.95	4
HI1563(c)	45.41	2	43.72	2	44.56	2
PBW833	36.03	7	40.07	7	38.05	7
HI1621(c)	38.47	6	40.28	6	39.37	6
HD3118(c)	41.94	5	41.24	5	41.59	5
PBW835	43.66	3	42.51	3	43.09	3
DBW107(c)	46.09	1	45.41	1	45.75	1
Mean	41.97		42.13		42.05	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.32	1.31	3.48	
Genotype (B)		**	0.64	1.55	3.74	
B within A		N.S.	0.91	2.20		
A within B			0.90	2.18		
<b>Earhead/sqm</b>						
DBW316	239	6	306	6	273	7
HI1563(c)	305	1	333	3	319	2
PBW833	232	7	322	5	277	6
HI1621(c)	287	2	366	1	326	1
HD3118(c)	271	5	329	4	300	4
PBW835	281	3	341	2	311	3
DBW107(c)	275	4	301	7	288	5
Mean	270		328		299	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	16	66	25	
Genotype (B)		*	11	27	9	
B within A		N.S.	16	38		
A within B			22	52		
<b>Grains/Earhead</b>						
DBW316	40.81	1	31.77	2	36.29	1
HI1563(c)	33.79	6	30.79	3	32.29	6
PBW833	36.71	3	29.33	4	33.02	3
HI1621(c)	31.10	7	26.47	7	28.78	7
HD3118(c)	36.17	4	28.80	6	32.49	4
PBW835	35.72	5	29.15	5	32.44	5
DBW107(c)	37.38	2	33.77	1	35.57	2
Mean	35.95		30.01		32.98	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	1.03	4.21	14.28	
Genotype (B)		**	1.00	2.42	7.42	
B within A		N.S.	1.41	3.42		
A within B			1.66	4.02		
<b>1000 Grains Weight, g</b>						
DBW316	43.39	4	43.53	4	43.46	3
HI1563(c)	44.32	2	43.70	3	44.01	2
PBW833	42.36	7	43.12	6	42.74	7
HI1621(c)	43.26	5	42.44	7	42.85	6
HD3118(c)	42.88	6	43.82	2	43.35	4
PBW835	43.48	3	43.21	5	43.35	5
DBW107(c)	45.17	1	44.82	1	45.00	1
Mean	43.55		43.52		43.54	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	0.42	1.72	4.40	
Genotype (B)		N.S.	0.56	1.36	3.17	
B within A		N.S.	0.80	1.93		
A within B			0.85	2.05		
Date of Sowing	11.12.2021		03.01.2022			
Date of Harvesting	08.04.2022		18.04.2022			



Table 3.4.9. North Eastern Plains Zone		IR-LS-DOS-TAS			Varanasi	2021-22
Genotype	Date of Sowing				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
DBW316	41.69	7	31.68	5	36.69	7
HI1563(c)	44.97	6	31.47	6	38.22	5
PBW833	46.51	3	33.01	3	39.76	3
HI1621(c)	45.00	5	30.24	7	37.62	6
HD3118(c)	48.71	1	33.07	2	40.89	2
PBW835	45.47	4	31.97	4	38.72	4
DBW107(c)	48.26	2	34.69	1	41.47	1
Mean	45.80		32.31		39.05	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		**	0.15	0.62	1.77	
Genotype (B)		**	0.34	0.82	2.13	
B within A		**	0.48	1.16		
A within B			0.47	1.14		
<b>Earhead/sqm</b>						
DBW316	378	4	322	7	350	7
HI1563(c)	426	1	371	5	399	1
PBW833	391	3	393	2	392	3
HI1621(c)	375	5	418	1	397	2
HD3118(c)	354	7	392	3	373	5
PBW835	397	2	381	4	389	4
DBW107(c)	368	6	353	6	361	6
Mean	384		376		380	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		N.S.	6	24	7	
Genotype (B)		**	9	23	6	
B within A		**	13	32		
A within B			14	33		
<b>Grains/Earhead</b>						
DBW316	27.78	7	28.48	3	28.13	6
HI1563(c)	28.45	6	27.94	4	28.19	5
PBW833	35.20	3	29.34	2	32.27	3
HI1621(c)	31.71	4	23.14	7	27.42	7
HD3118(c)	38.29	1	26.66	6	32.47	2
PBW835	31.62	5	27.07	5	29.35	4
DBW107(c)	36.94	2	30.76	1	33.85	1
Mean	32.86		27.62		30.24	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.50	2.06	7.60	
Genotype (B)		**	0.90	2.18	7.31	
B within A		**	1.28	3.09		
A within B			1.28	3.10		
<b>1000 Grains Weight, g</b>						
DBW316	39.73	1	34.63	1	37.18	1
HI1563(c)	37.36	3	30.46	6	33.91	3
PBW833	33.94	7	28.77	7	31.35	7
HI1621(c)	37.93	2	31.47	4	34.70	2
HD3118(c)	35.95	5	31.73	3	33.84	5
PBW835	36.30	4	31.15	5	33.73	6
DBW107(c)	35.68	6	32.11	2	33.90	4
Mean	36.70		31.48		34.09	
		F. Test	SEm	CD (0.05)	CV (%)	
Date of Sowing (A)		*	0.45	1.86	6.09	
Genotype (B)		**	0.46	1.11	3.31	
B within A		N.S.	0.65	1.58		
A within B			0.75	1.82		
Date of Sowing	10.12.2021		01.01.2022			
Date of Harvesting	11.04.2022		14.04.2022			

Table 4.2.1. Central Zone		IR-TS-DOS-TAD			Bilaspur	2021-22
Genotype	Sowing Time				Mean	Rk
	Timely	Rk	Late	Rk		
<b>Yield, q/ha</b>						
HI1650	43.21	5	36.25	5	39.73	5
MACS6768	46.64	3	39.16	3	42.90	3
MP3535	41.42	7	32.45	7	36.94	7
GW513 (I)	48.08	1	41.24	1	44.66	1
HI1544 (C)	46.77	2	40.37	2	43.57	2
GW322 (C)	44.73	4	38.86	4	41.80	4
HI1636 (I)	42.12	6	34.82	6	38.47	6
Mean	44.71		37.59		41.15	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	1.16	4.77	12.95		
Genotypes (B)	**	0.80	1.95	4.79		
B within A	N.S.	1.14	2.75			
A within B		1.57	3.80			
<b>Earhead/sq.m.</b>						
HI1650	374	5	370	5	372	5
MACS6768	389	3	377	3	383	2
MP3535	370	6	359	7	365	6
GW513 (I)	391	1	385	1	388	1
HI1544 (C)	389	2	377	4	383	3
GW322 (C)	376	4	382	2	379	4
HI1636 (I)	367	7	362	6	364	7
Mean	379		373		376	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	3.54	14.54	4.31		
Genotypes (B)	**	4.55	11.00	2.96		
B within A	N.S.	6.43	15.56			
A within B		6.93	16.76			
<b>Grains /earhead</b>						
HI1650	26.98	5	24.37	5	25.68	5
MACS6768	27.80	3	25.13	3	26.47	3
MP3535	26.25	7	22.63	7	24.44	7
GW513 (I)	27.92	1	25.52	2	26.72	2
HI1544 (C)	27.83	2	25.65	1	26.74	1
GW322 (C)	27.79	4	24.96	4	26.38	4
HI1636 (I)	26.75	6	23.96	6	25.36	6
Mean	27.33		24.60		25.97	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	1.14	4.69	20.20		
Genotypes (B)	N.S.	0.78	1.89	7.37		
B within A	N.S.	1.10	2.67			
A within B		1.53	3.71			

1000 grain wt, g						
HI1650	43.02	5	40.21	5	41.61	5
MACS6768	43.47	3	41.30	3	42.38	3
MP3535	42.75	7	39.91	7	41.33	7
GW513 (I)	44.05	1	42.13	1	43.09	1
HI1544 (C)	43.48	2	41.79	2	42.63	2
GW322 (C)	43.04	4	40.85	4	41.95	4
HI1636 (I)	43.01	6	40.19	6	41.60	6
Mean	43.26		40.91		42.08	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.49	2.00	5.30		
Genotypes (B)	N.S.	1.00	2.41	5.80		
B within A	N.S.	1.41	3.41			
A within B		1.39	3.37			
Date of Sowing:		12.11.2021		03.12.2021		
Date of Harvesting:		04.04.2022		18.04.2022		

**Table 4.2.2. Central Zone IR-TS-DOS-TAD Durgapura 2021-22**

Genotypes	Sowing Time				Mean	Rk
	Timely	Rk	Late	Rk		
	Yield, q/ha					
HI1650	45.23	6	43.26	1	44.24	2
MACS6768	46.55	5	41.97	2	44.26	1
MP3535	49.23	4	31.01	7	40.12	7
GW513 (I)	44.23	7	40.81	3	42.52	6
HI1544 (C)	53.69	1	32.99	5	43.34	3
GW322 (C)	52.37	3	33.65	4	43.01	4
HI1636 (I)	52.61	2	32.64	6	42.63	5
Mean	49.13		36.62		42.87	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.32	1.32	3.44		
Genotypes (B)	N.S.	1.09	2.65	6.25		
B within A	**	1.55	3.74			
A within B		1.47	3.55			
	Earhead/sq.m.					
HI1650	328	6	312	2	320	2
MACS6768	334	5	360	1	347	1
MP3535	359	4	276	4	317	3
GW513 (I)	326	7	299	3	313	5
HI1544 (C)	365	1	262	5	313	4
GW322 (C)	362	2	258	6	310	6
HI1636 (I)	359	3	254	7	306	7
Mean	347		289		318	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.66	2.73	0.96		
Genotypes (B)	**	6.00	14.52	4.62		
B within A	**	8.49	20.54			
A within B		7.89	19.08			

<b>Grains /earhead</b>						
HI1650	34.05	7	33.66	2	33.85	5
MACS6768	36.70	3	31.59	4	34.14	4
MP3535	35.04	5	27.27	7	31.16	7
GW513 (I)	34.59	6	34.48	1	34.53	2
HI1544 (C)	37.81	1	31.23	5	34.52	3
GW322 (C)	36.11	4	30.97	6	33.54	6
HI1636 (I)	37.07	2	33.30	3	35.19	1
Mean	35.91		31.79		33.85	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.72	2.94	9.72		
Genotypes (B)	N.S.	0.98	2.37	7.09		
B within A	N.S.	1.39	3.35			
A within B		1.47	3.56			
<b>1000 grain wt, g</b>						
HI1650	40.57	1	41.27	3	40.92	2
MACS6768	38.08	7	37.05	7	37.57	7
MP3535	39.23	6	41.27	2	40.25	3
GW513 (I)	39.25	5	39.64	5	39.44	5
HI1544 (C)	39.35	4	40.37	4	39.86	4
GW322 (C)	40.04	2	42.18	1	41.11	1
HI1636 (I)	39.59	3	38.65	6	39.12	6
Mean	39.44		40.06		39.75	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	1.00	4.11	11.56		
Genotypes (B)	N.S.	0.87	2.11	5.36		
B within A	N.S.	1.23	2.98			
A within B		1.52	3.67			
Date of Sowing:		18.11.2021		08.12.2021		
Date of Harvesting:		21.3.2022		02.4.2022		

<b>Table 4.2.3. Central Zone</b>						
<b>Genotypes</b>	<b>IR-TS-DOS-TAD</b>				<b>Indore</b>	<b>2021-22</b>
	<b>Sowing Time</b>				<b>Mean</b>	<b>Rk</b>
	<b>Timely</b>	<b>Rk</b>	<b>Late</b>	<b>Rk</b>		
<b>Yield, q/ha</b>						
HI1650	55.37	1	50.27	3	52.82	1
MACS6768	52.77	3	48.10	6	50.43	5
MP3535	45.20	7	48.50	5	46.85	6
GW513 (I)	52.53	4	51.20	1	51.87	2
HI1544 (C)	54.33	2	49.27	4	51.80	3
GW322 (C)	46.33	6	46.10	7	46.22	7
HI1636 (I)	51.57	5	50.43	2	51.00	4
Mean	51.16		49.12		50.14	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.79	3.24	7.23		
Genotypes (B)	**	0.78	1.89	3.81		
B within A	**	1.10	2.67			
A within B		1.29	3.12			

<b>Earhead/sq.m.</b>						
HI1650	371	1	344	1	357	1
MACS6768	326	6	270	7	298	6
MP3535	345	4	328	3	337	3
GW513 (I)	330	5	313	4	321	5
HI1544 (C)	357	2	340	2	348	2
GW322 (C)	356	3	292	5	324	4
HI1636 (I)	308	7	276	6	292	7
Mean	342		309		325	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	2.90	11.91	4.09		
Genotypes (B)	**	7.02	16.99	5.29		
B within A	N.S.	9.93	24.03			
A within B		9.64	23.33			
<b>Grains /earhead</b>						
HI1650	30.93	5	35.47	7	33.20	7
MACS6768	35.33	1	48.07	1	41.70	1
MP3535	31.09	4	37.17	4	34.13	5
GW513 (I)	31.31	3	36.61	6	33.96	6
HI1544 (C)	33.16	2	36.67	5	34.92	3
GW322 (C)	30.45	6	44.61	2	37.53	2
HI1636 (I)	30.39	7	38.23	3	34.31	4
Mean	31.81		39.54		35.68	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.13	0.53	1.65		
Genotypes (B)	**	1.04	2.52	7.15		
B within A	**	1.47	3.57			
A within B		1.37	3.32			
<b>1000 grain wt, g</b>						
HI1650	48.37	3	41.27	3	44.82	3
MACS6768	45.93	4	37.20	6	41.57	5
MP3535	42.17	7	39.90	5	41.03	6
GW513 (I)	50.90	2	44.77	2	47.83	2
HI1544 (C)	45.90	5	40.07	4	42.98	4
GW322 (C)	42.87	6	35.33	7	39.10	7
HI1636 (I)	55.13	1	47.83	1	51.48	1
Mean	47.32		40.91		44.12	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.24	0.98	2.48		
Genotypes (B)	**	0.26	0.63	1.44		
B within A	**	0.37	0.89			
A within B		0.42	1.00			
Date of Sowing:		12.11.2021		7.12.2021		
Date of Harvesting:		19.3.2022		29.3.2022		

<b>Table 4.2.4. Central Zone</b>		<b>IR-TS-DOS-TAD</b>		<b>Jabalpur</b>	<b>2021-22</b>	
<b>Genotypes</b>	<b>Sowing Time</b>				<b>Mean</b>	<b>Rk</b>
	<b>Timely</b>	<b>Rk</b>	<b>Late</b>	<b>Rk</b>		
<b>Yield, q/ha</b>						
HI1650	48.78	3	46.12	3	47.45	3
MACS6768	46.20	4	44.21	4	45.20	4
MP3535	39.29	7	41.64	6	40.46	6
GW513 (I)	53.16	2	50.51	2	51.84	2
HI1544 (C)	57.03	1	53.30	1	55.16	1
GW322 (C)	41.31	6	37.02	7	39.17	7
HI1636 (I)	45.29	5	41.64	5	43.47	5
<b>Mean</b>	<b>47.29</b>		<b>44.92</b>		<b>46.11</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	N.S.	1.11	4.53	10.99		
Genotypes (B)	**	1.26	3.05	6.70		
B within A	N.S.	1.78	4.32			
A within B		1.99	4.81			
<b>Earhead/sq.m.</b>						
HI1650	344	6	306	4	325	5
MACS6768	368	3	300	5	334	4
MP3535	357	4	320	2	339	3
GW513 (I)	387	2	317	3	352	2
HI1544 (C)	404	1	348	1	376	1
GW322 (C)	356	5	281	7	319	6
HI1636 (I)	320	7	284	6	302	7
<b>Mean</b>	<b>362</b>		<b>308</b>		<b>335</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	**	0.36	1.49	0.50		
Genotypes (B)	**	3.07	7.44	2.25		
B within A	**	4.35	10.52			
A within B		4.04	9.78			
<b>Grains /earhead</b>						
HI1650	30.91	3	35.62	4	33.27	3
MACS6768	28.54	4	37.94	2	33.24	4
MP3535	26.65	6	35.04	5	30.85	5
GW513 (I)	27.04	5	32.15	6	29.60	6
HI1544 (C)	36.84	1	37.91	3	37.38	1
GW322 (C)	31.16	2	42.86	1	37.01	2
HI1636 (I)	26.33	7	29.77	7	28.05	7
<b>Mean</b>	<b>29.64</b>		<b>35.90</b>		<b>32.77</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	N.S.	1.17	4.81	16.41		
Genotypes (B)	**	1.69	4.08	12.62		
B within A	N.S.	2.39	5.78			
A within B		2.50	6.05			

1000 grain wt, g						
HI1650	46.13	3	42.66	3	44.40	3
MACS6768	44.28	4	38.98	5	41.63	4
MP3535	41.32	5	37.32	6	39.32	6
GW513 (I)	50.89	2	50.22	1	50.55	2
HI1544 (C)	38.59	6	40.59	4	39.59	5
GW322 (C)	37.23	7	31.11	7	34.17	7
HI1636 (I)	54.23	1	49.25	2	51.74	1
Mean	44.67		41.45		43.06	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.40	1.63	4.22		
Genotypes (B)	**	1.64	3.97	9.34		
B within A	N.S.	2.32	5.62			
A within B		2.19	5.29			
Date of Sowing:		14.11.2021		06.12.2021		
Date of Harvesting:		26.03.2022		12.04.2022		

**Table 4.2.5. Central Zone IR-TS-DOS-TAD Junagadh 2021-22**

Genotypes	Sowing Time				Mean	Rk
	Timely	Rk	Late	Rk		
Yield, q/ha						
HI1650	55.25	1	52.86	4	54.05	4
MACS6768	52.14	5	52.70	5	52.42	5
MP3535	42.18	7	50.68	7	46.43	7
GW513 (I)	53.12	4	58.38	1	55.75	1
HI1544 (C)	53.65	3	56.99	2	55.32	3
GW322 (C)	54.73	2	56.35	3	55.54	2
HI1636 (I)	47.22	6	51.39	6	49.31	6
Mean	51.19		54.19		52.69	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	2.27	9.31	19.74		
Genotypes (B)	**	1.17	2.84	5.46		
B within A	N.S.	1.66	4.02			
A within B		2.74	6.63			
Earhead/sq.m.						
HI1650	363	6	388	4	376	5
MACS6768	380	4	388	5	384	4
MP3535	447	1	462	1	454	1
GW513 (I)	353	7	380	6	367	7
HI1544 (C)	412	2	433	2	423	2
GW322 (C)	403	3	417	3	410	3
HI1636 (I)	365	5	380	6	373	6
Mean	389		407		398	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	8.83	36.22	10.17		
Genotypes (B)	**	13.37	32.36	8.23		
B within A	N.S.	18.91	45.77			
A within B		19.61	47.46			

<b>Grains /earhead</b>						
HI1650	27.61	2	24.25	4	25.93	2
MACS6768	25.12	4	24.06	6	24.59	4
MP3535	17.84	7	20.29	7	19.06	7
GW513 (I)	25.65	3	25.93	2	25.79	3
HI1544 (C)	24.71	5	24.27	3	24.49	5
GW322 (C)	27.88	1	26.84	1	27.36	1
HI1636 (I)	23.59	6	24.23	5	23.91	6
Mean	24.63		24.27		24.45	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.95	3.90	17.84		
Genotypes (B)	**	1.06	2.57	10.65		
B within A	N.S.	1.50	3.64			
A within B		1.69	4.08			
<b>1000 grain wt, g</b>						
HI1650	55.53	2	56.40	3	55.97	2
MACS6768	55.13	3	56.67	2	55.90	3
MP3535	53.00	5	54.27	5	53.63	5
GW513 (I)	58.60	1	59.27	1	58.93	1
HI1544 (C)	53.00	5	54.27	5	53.63	5
GW322 (C)	49.53	7	50.73	7	50.13	7
HI1636 (I)	55.07	4	56.27	4	55.67	4
Mean	54		55		55	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.08	0.31	0.64		
Genotypes (B)	**	0.61	1.48	2.74		
B within A	N.S.	0.87	2.10			
A within B		0.81	1.95			
Date of Sowing:		16.11.2021		07.12.2021		
Date of Harvesting:		03.10.2022		17.03.2022		

<b>Table 4.2.6. Central Zone</b>	<b>IR-TS-DOS-TAD</b>				<b>Powarkheda 2021-22</b>	
	<b>Sowing Time</b>					
<b>Genotypes</b>	Timely	Rk	Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HI1650	51.71	3	37.22	5	44.47	4
MACS6768	46.84	4	45.78	3	46.31	3
MP3535	31.25	7	34.37	6	32.81	7
GW513 (I)	53.78	2	48.43	2	51.11	2
HI1544 (C)	57.67	1	55.51	1	56.59	1
GW322 (C)	43.38	6	30.79	7	37.09	6
HI1636 (I)	45.79	5	41.11	4	43.45	5
Mean	47.20		41.89		44.55	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.36	1.48	3.70		
Genotypes (B)	**	1.34	3.25	7.38		
B within A	**	1.90	4.59			
A within B		1.79	4.34			



<b>Earhead/sq.m.</b>						
HI1650	510	2	298	7	404	6
MACS6768	422	5	390	5	406	5
MP3535	517	1	427	3	472	2
GW513 (I)	473	4	413	4	443	4
HI1544 (C)	412	6	538	1	475	1
GW322 (C)	488	3	455	2	472	2
HI1636 (I)	375	7	310	6	343	7
Mean	457		405		431	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	7.65	31.37	8.14		
Genotypes (B)	**	7.41	17.93	4.22		
B within A	**	10.48	25.36			
A within B		12.36	29.90			
<b>Grains /earhead</b>						
HI1650	22.12	6	28.98	3	25.55	4
MACS6768	25.31	3	30.50	2	27.91	2
MP3535	14.95	7	23.39	7	19.17	7
GW513 (I)	22.28	5	23.88	6	23.08	6
HI1544 (C)	39.36	1	31.44	1	35.40	1
GW322 (C)	29.39	2	25.46	5	27.43	3
HI1636 (I)	23.40	4	26.64	4	25.02	5
Mean	25.26		27.18		26.22	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.58	2.36	10.07		
Genotypes (B)	**	1.29	3.13	12.09		
B within A	**	1.83	4.43			
A within B		1.79	4.33			
<b>1000 grain wt, g</b>						
HI1650	46.40	3	43.53	3	44.97	3
MACS6768	44.00	4	38.84	4	41.42	4
MP3535	40.38	5	34.59	5	37.49	5
GW513 (I)	51.08	2	49.41	2	50.24	2
HI1544 (C)	35.74	6	32.97	6	34.36	6
GW322 (C)	30.43	7	26.87	7	28.65	7
HI1636 (I)	52.30	1	50.18	1	51.24	1
Mean	42.90		39.48		41.19	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.78	3.21	8.71		
Genotypes (B)	**	1.52	3.67	9.02		
B within A	N.S.	2.15	5.19			
A within B		2.14	5.17			
Date of Sowing:		12.11.2021		04.12.2021		
Date of Harvesting:		21.03.2022		31.03.2022		

<b>Table 4.2.7. Central Zone</b>		<b>IR-TS-DOS-TAD</b>		<b>Udaipur</b>	<b>2021-22</b>	
<b>Genotypes</b>	<b>Sowing Time</b>				<b>Mean</b>	<b>Rk</b>
	<b>Timely</b>	<b>Rk</b>	<b>Late</b>	<b>Rk</b>		
<b>Yield, q/ha</b>						
HI1650	55.89	1	52.20	1	54.05	1
MACS6768	55.49	2	50.06	3	52.78	3
MP3535	48.67	6	43.67	5	46.17	6
GW513 (I)	52.36	5	47.56	4	49.96	4
HI1544 (C)	53.67	4	43.04	6	48.35	5
GW322 (C)	54.94	3	50.93	2	52.94	2
HI1636 (I)	45.14	7	37.33	7	41.23	7
<b>Mean</b>	<b>52.31</b>		<b>46.40</b>		<b>49.35</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	**	0.23	0.94	2.12		
Genotypes (B)	**	2.02	4.89	10.04		
B within A	N.S.	2.86	6.92			
A within B		2.66	6.43			
<b>Earhead/sq.m.</b>						
HI1650	342	6	322	6	332	6
MACS6768	387	2	363	2	375	2
MP3535	415	1	395	1	405	1
GW513 (I)	347	5	332	4	339	5
HI1544 (C)	353	4	327	5	340	4
GW322 (C)	362	3	353	3	358	3
HI1636 (I)	307	7	293	7	300	7
<b>Mean</b>	<b>359</b>		<b>341</b>		<b>350</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	N.S.	5.52	22.64	7.23		
Genotypes (B)	**	8.10	19.60	5.67		
B within A	N.S.	11.45	27.72			
A within B		11.96	28.93			
<b>Grains /earhead</b>						
HI1650	34.00	2	35.65	1	34.83	1
MACS6768	30.15	6	31.06	4	30.60	5
MP3535	25.56	7	27.81	6	26.69	7
GW513 (I)	33.00	5	33.48	2	33.24	2
HI1544 (C)	33.09	4	30.89	5	31.99	4
GW322 (C)	33.20	3	32.46	3	32.83	3
HI1636 (I)	34.69	1	26.50	7	30.60	6
<b>Mean</b>	<b>31.96</b>		<b>31.12</b>		<b>31.54</b>	
	<b>F. Test</b>	<b>SEm</b>	<b>CD (0.05)</b>	<b>CV (%)</b>		
Date of sowing (A)	N.S.	0.61	2.52	8.93		
Genotypes (B)	*	1.43	3.45	11.08		
B within A	N.S.	2.02	4.88			
A within B		1.97	4.76			

1000 grain wt, g						
HI1650	48.39	1	45.87	2	47.13	1
MACS6768	47.76	2	44.65	3	46.20	2
MP3535	45.78	6	39.95	7	42.87	7
GW513 (I)	45.98	4	43.17	5	44.58	5
HI1544 (C)	45.94	5	42.71	6	44.32	6
GW322 (C)	45.99	3	44.27	4	45.13	4
HI1636 (I)	42.48	7	48.04	1	45.26	3
Mean	46.05		44.10		45.07	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.28	1.16	2.87		
Genotypes (B)	N.S.	0.96	2.31	5.19		
B within A	*	1.35	3.27			
A within B		1.28	3.10			
Date of Sowing:		16.11.2021		06.12.2021		
Date of Harvesting:		26.03.2022		01.04.2022		

Table 4.2.8. Central Zone						
IR-TS-DOS-TAD					Vijapur	2021-22
Genotypes	Sowing Time			Mean	Rk	
	Timely	Rk	Late			
Yield, q/ha						
HI1650	46.83	6	43.92	3	45.38	6
MACS6768	53.71	2	46.92	1	50.31	1
MP3535	44.00	7	38.13	7	41.06	7
GW513 (I)	54.54	1	43.42	4	48.98	3
HI1544 (C)	52.13	4	46.50	2	49.31	2
GW322 (C)	51.21	5	43.33	5	47.27	4
HI1636 (I)	52.50	3	41.54	6	47.02	5
Mean	50.70		43.39		47.05	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.88	3.62	8.59		
Genotypes (B)	**	1.19	2.89	6.22		
B within A	N.S.	1.69	4.09			
A within B		1.80	4.35			
Earhead/sq.m.						
HI1650	345	7	419	3	382	5
MACS6768	358	5	371	6	365	6
MP3535	499	1	416	4	457	1
GW513 (I)	384	3	338	7	361	7
HI1544 (C)	380	4	410	5	395	4
GW322 (C)	421	2	467	1	444	2
HI1636 (I)	354	6	446	2	400	3
Mean	391		410		401	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	8.17	33.52	9.35		
Genotypes (B)	**	16.90	40.89	10.33		
B within A	*	23.90	57.83			
A within B		23.59	57.08			

<b>Grains /earhead</b>						
HI1650	22.13	6	25.20	4	23.67	5
MACS6768	25.96	1	30.11	1	28.03	1
MP3535	15.53	7	22.50	6	19.02	7
GW513 (I)	23.41	4	27.17	2	25.29	2
HI1544 (C)	24.12	2	25.69	3	24.91	3
GW322 (C)	23.11	5	24.46	5	23.78	4
HI1636 (I)	23.64	3	19.43	7	21.53	6
Mean	22.56		24.94		23.75	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.86	3.54	16.67		
Genotypes (B)	**	1.16	2.80	11.94		
B within A	N.S.	1.64	3.96			
A within B		1.74	4.22			
<b>1000 grain wt, g</b>						
HI1650	61.40	2	42.33	4	51.87	3
MACS6768	58.29	4	42.07	5	50.18	5
MP3535	56.89	6	40.83	6	48.86	6
GW513 (I)	61.19	3	47.52	2	54.36	2
HI1544 (C)	56.97	5	45.11	3	51.04	4
GW322 (C)	52.75	7	39.06	7	45.90	7
HI1636 (I)	63.05	1	47.91	1	55.48	1
Mean	58.65		43.55		51.10	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.08	0.33	0.73		
Genotypes (B)	**	0.83	2.01	3.99		
B within A	N.S.	1.18	2.85			
A within B		1.09	2.64			
Date of Sowing:		13.11.2021		04.12.2021		
Date of Harvesting:		03.03.2022		22.03.2022		

<b>Table 4.4.1. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Bilaspur</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	37.69	4	32.82	2	35.25	2	
HI1634 (C)	35.54	5	31.55	3	33.55	5	
MP3336 (C)	34.08	6	28.98	6	31.53	6	
HD2864 (C)	38.08	3	34.62	1	36.35	1	
CG1029 (C)	39.90	1	29.74	4	34.82	3	
HD3407	38.41	2	29.67	5	34.04	4	
Mean	37.28		31.23		34.25		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	0.63	2.60	7.81			
Genotype (B)	N.S.	1.34	3.28	9.61			
B within A	N.S.	1.90	4.64				
A within B		1.85	4.50				
<b>Earhead/sq.m.</b>							
HD2932 (C)	309	4	311	2	310	2	
HI1634 (C)	301	5	305	3	303	5	
MP3336 (C)	294	6	280	6	287	6	
HD2864 (C)	315	3	320	1	317	1	
CG1029 (C)	329	1	286	5	308	4	
HD3407	322	2	296	4	309	3	
Mean	312		300		306		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.76	3.14	1.05			
Genotype (B)	**	0.96	2.35	0.77			
B within A	**	1.36	3.33				
A within B		1.46	3.56				
<b>Grains /earhead</b>							
HD2932 (C)	29.9	1	26.3	4	28.1	2	
HI1634 (C)	29.1	3	25.9	5	27.5	5	
MP3336 (C)	29.0	4	27.3	1	28.1	1	
HD2864 (C)	29.5	2	26.5	3	28.0	3	
CG1029 (C)	28.8	5	26.8	2	27.8	4	
HD3407	28.5	6	25.8	6	27.1	6	
Mean	29.1		26.4		27.8		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	0.60	2.49	9.20			
Genotype (B)	N.S.	1.21	2.95	10.65			
B within A	N.S.	1.71	4.17				
A within B		1.67	4.08				
<b>1000 grain wt, g</b>							
HD2932 (C)	41.00	4	40.11	2	40.56	2	
HI1634 (C)	40.58	5	39.91	3	40.24	5	
MP3336 (C)	40.03	6	37.89	6	38.96	6	
HD2864 (C)	41.14	3	40.98	1	41.06	1	
CG1029 (C)	42.09	1	38.92	5	40.51	3	
HD3407	41.68	2	39.06	4	40.37	4	
Mean	41.09		39.48		40.28		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	1.48	6.13	15.62			
Genotype (B)	*	0.41	1.00	2.50			
B within A	N.S.	0.58	1.42				
A within B		1.58	3.84				
Date of Sowing:		03.12.2021		24.12.2021			
Date of Harvesting:		10.04.2022		17.04.2022			

<b>Table 4.4.2. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Durgapura</b>	<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
HD2932 (C)	39.31	3	27.27	5	33.29	4
HI1634 (C)	30.14	6	29.36	4	29.75	6
MP3336 (C)	34.28	5	34.94	1	34.61	2
HD2864 (C)	41.83	1	32.99	2	37.41	1
CG1029 (C)	37.28	4	31.89	3	34.59	3
HD3407	40.82	2	23.99	6	32.40	5
Mean	37.28		30.07		33.68	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.48	1.98	6.03		
Genotype (B)	**	0.85	2.07	6.16		
B within A	**	1.20	2.92			
A within B		1.19	2.91			
<b>Earhead/sq.m.</b>						
HD2932 (C)	292	3	210	5	251	4
HI1634 (C)	228	6	219	4	223	6
MP3336 (C)	255	5	256	1	256	2
HD2864 (C)	318	1	241	2	280	1
CG1029 (C)	272	4	232	3	252	3
HD3407	297	2	190	6	244	5
Mean	277		225		251	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	5.61	23.17	9.49		
Genotype (B)	**	6.11	14.91	5.97		
B within A	**	8.65	21.09			
A within B		9.68	23.62			
<b>Grains /earhead</b>						
HD2932 (C)	32.5	5	37.2	2	34.8	5
HI1634 (C)	36.4	2	34.2	5	35.3	1
MP3336 (C)	32.5	6	37.5	1	35.0	3
HD2864 (C)	33.2	4	36.9	3	35.1	2
CG1029 (C)	33.4	3	35.6	4	34.5	6
HD3407	36.8	1	32.9	6	34.9	4
Mean	34.1		35.7		34.9	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.17	0.71	2.08		
Genotype (B)	N.S.	0.83	2.02	5.81		
B within A	**	1.17	2.86			
A within B		1.08	2.64			
<b>1000 grain wt, g</b>						
HD2932 (C)	41.50	1	35.00	6	38.25	4
HI1634 (C)	36.50	6	39.33	1	37.92	6
MP3336 (C)	41.40	2	36.50	5	38.95	2
HD2864 (C)	39.67	4	37.17	4	38.42	3
CG1029 (C)	41.00	3	38.71	2	39.85	1
HD3407	37.37	5	38.54	3	37.96	5
Mean	39.57		37.54		38.56	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.49	2.01	5.35		
Genotype (B)	N.S.	0.86	2.10	5.47		
B within A	**	1.22	2.97			
A within B		1.21	2.96			
Date of Sowing:		08.12.2021		30.12.2021		
Date of Harvesting:		02.04.2022		10.04.2022		

<b>Table 4.4.3. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Indore</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	55.17	3	44.27	3	49.72	3	
HI1634 (C)	53.70	5	39.47	6	46.58	5	
MP3336 (C)	53.73	4	43.03	4	48.38	4	
HD2864 (C)	48.93	6	42.67	5	45.80	6	
CG1029 (C)	56.53	2	45.57	2	51.05	2	
HD3407	57.13	1	45.87	1	51.50	1	
Mean	54.20		43.48		48.84		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.63	2.60	5.47			
Genotype (B)	**	0.79	1.93	3.97			
B within A	N.S.	1.12	2.73				
A within B		1.20	2.93				
<b>Earhead/sq.m.</b>							
HD2932 (C)	304	5	290	6	297	6	
HI1634 (C)	302	6	308	5	305	5	
MP3336 (C)	371	1	349	1	360	1	
HD2864 (C)	320	4	330	4	325	4	
CG1029 (C)	345	2	333	3	339	3	
HD3407	342	3	343	2	342	2	
Mean	331		325		328		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	2.35	9.72	3.04			
Genotype (B)	**	7.44	18.15	5.56			
B within A	N.S.	10.52	25.67				
A within B		9.89	24.12				
<b>Grains /earhead</b>							
HD2932 (C)	44.7	1	48.4	1	46.6	1	
HI1634 (C)	43.2	2	39.6	3	41.4	3	
MP3336 (C)	35.7	5	35.5	5	35.6	5	
HD2864 (C)	39.4	4	39.2	4	39.3	4	
CG1029 (C)	32.4	6	34.1	6	33.2	6	
HD3407	42.9	3	44.2	2	43.5	2	
Mean	39.7		40.2		39.9		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	0.36	1.50	3.87			
Genotype (B)	**	1.42	3.46	8.71			
B within A	N.S.	2.01	4.90				
A within B		1.87	4.56				
<b>1000 grain wt, g</b>							
HD2932 (C)	40.67	3	31.67	5	36.17	4	
HI1634 (C)	41.40	2	32.53	4	36.97	3	
MP3336 (C)	40.60	4	34.77	2	37.68	2	
HD2864 (C)	39.03	6	33.03	3	36.03	5	
CG1029 (C)	50.70	1	40.20	1	45.45	1	
HD3407	39.07	5	30.33	6	34.70	6	
Mean	41.91		33.76		37.83		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.18	0.75	2.03			
Genotypes (B)	**	0.30	0.72	1.91			
B within A	**	0.42	1.02				
A within B		0.42	1.03				
Date of Sowing:		04.12.2021		28.12.2021			
Date of Harvesting:		02.04.2022		09.04.2022			

<b>Table 4.4.4. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Jabalpur</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	49.53	5	32.40	5	40.97	5	
HI1634 (C)	51.07	4	32.51	4	41.79	4	
MP3336 (C)	43.15	6	28.74	6	35.94	6	
HD2864 (C)	51.22	3	39.25	1	45.24	2	
CG1029 (C)	53.36	2	35.57	2	44.46	3	
HD3407	57.33	1	33.76	3	45.55	1	
Mean	50.94		33.71		42.32		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.22	0.92	2.23			
Genotype (B)	**	1.22	2.98	7.08			
B within A	*	1.73	4.22				
A within B		1.59	3.89				
<b>Earhead/sq.m.</b>							
HD2932 (C)	339	4	286	4	313	5	
HI1634 (C)	367	2	295	3	331	2	
MP3336 (C)	310	6	272	6	291	6	
HD2864 (C)	330	5	314	1	322	3	
CG1029 (C)	354	3	283	5	318	4	
HD3407	389	1	300	2	345	1	
Mean	348		292		320		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.69	2.84	0.91			
Genotype (B)	**	1.90	4.65	1.46			
B within A	**	2.69	6.57				
A within B		2.55	6.23				
<b>Grains /earhead</b>							
HD2932 (C)	28.8	5	27.2	4	28.0	5	
HI1634 (C)	29.2	4	31.0	2	30.1	3	
MP3336 (C)	31.8	3	25.1	5	28.4	4	
HD2864 (C)	36.7	1	31.2	1	34.0	1	
CG1029 (C)	27.5	6	24.6	6	26.0	6	
HD3407	33.5	2	29.5	3	31.5	2	
Mean	31.3		28.1		29.7		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.15	0.63	2.18			
Genotype (B)	**	0.87	2.12	7.16			
B within A	*	1.23	2.99				
A within B		1.13	2.76				
<b>1000 grain wt, g</b>							
HD2932 (C)	50.90	2	41.61	3	46.25	2	
HI1634 (C)	47.75	3	35.59	6	41.67	4	
MP3336 (C)	43.93	5	42.14	2	43.04	3	
HD2864 (C)	42.18	6	40.13	4	41.16	6	
CG1029 (C)	54.70	1	51.40	1	53.05	1	
HD3407	44.06	4	38.38	5	41.22	5	
Mean	47.25		41.54		44.40		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	0.42	1.72	3.98			
Genotype (B)	**	0.90	2.20	4.97			
B within A	**	1.27	3.11				
A within B		1.24	3.01				
Date of Sowing:		05.12.2021		26.12.2021			
Date of Harvesting:		12.04.2022		24.04.2022			



<b>Table 4.4.5. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Junagadh</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	57.30	2	37.42	6	47.36	4	
HI1634 (C)	55.52	4	38.41	4	46.97	5	
MP3336 (C)	54.01	6	38.77	3	46.39	6	
HD2864 (C)	55.16	5	42.90	1	49.03	1	
CG1029 (C)	58.85	1	37.94	5	48.39	2	
HD3407	56.15	3	39.56	2	47.86	3	
Mean	56.17		39.17		47.67		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	1.61	6.64	14.31			
Genotype (B)	N.S.	1.03	2.50	5.27			
B within A	N.S.	1.45	3.54				
A within B		2.08	5.08				
<b>Earhead/sq.m.</b>							
HD2932 (C)	425	1	373	5	399	3	
HI1634 (C)	375	6	387	3	381	6	
MP3336 (C)	395	5	380	4	388	4	
HD2864 (C)	418	2	391	2	405	2	
CG1029 (C)	410	4	362	6	386	5	
HD3407	413	3	398	1	406	1	
Mean	406		382		394		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	6.94	28.64	7.47			
Genotype (B)	*	6.03	14.70	3.75			
B within A	**	8.52	20.79				
A within B		10.42	25.43				
<b>Grains /earhead</b>							
HD2932 (C)	26.6	5	32.8	3	29.7	2	
HI1634 (C)	27.7	3	29.9	5	28.8	5	
MP3336 (C)	27.0	4	31.9	4	29.5	3	
HD2864 (C)	25.6	6	32.9	2	29.3	4	
CG1029 (C)	30.8	1	25.8	6	28.3	6	
HD3407	27.9	2	33.1	1	30.5	1	
Mean	27.6		31.1		29.3		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	0.43	1.78	6.22			
Genotype (B)	N.S.	0.53	1.30	4.43			
B within A	**	0.75	1.83				
A within B		0.81	1.97				
<b>1000 grain wt, g</b>							
HD2932 (C)	50.60	3	30.57	5	40.58	5	
HI1634 (C)	53.27	1	33.27	3	43.27	2	
MP3336 (C)	50.53	4	32.00	4	41.27	4	
HD2864 (C)	51.43	2	33.37	2	42.40	3	
CG1029 (C)	46.67	6	40.57	1	43.62	1	
HD3407	48.67	5	30.00	6	39.33	6	
Mean	50.19		33.29		41.74		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.28	1.16	2.86			
Genotype (B)	**	0.51	1.24	2.98			
B within A	**	0.72	1.75				
A within B		0.71	1.74				
Date of Sowing:		07.12.2021		27.12.2021			
Date of Harvesting:		17.03.2022		28.03.2022			

<b>Table 4.4.6. Central Zone</b>		<b>IR-LS-DOS-TAS</b>			<b>Powarkheda 2021-22</b>	
Genotype	Sowing Time				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
HD2932 (C)	46.18	3	32.33	5	39.26	5
HI1634 (C)	47.49	2	36.90	3	42.20	3
MP3336 (C)	38.76	6	29.97	6	34.37	6
HD2864 (C)	45.90	4	41.21	1	43.56	2
CG1029 (C)	43.31	5	38.89	2	41.10	4
HD3407	53.44	1	36.90	4	45.17	1
Mean	45.85		36.03		40.94	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.68	2.80	7.02		
Genotype (B)	**	1.45	3.53	8.65		
B within A	*	2.04	4.99			
A within B		1.99	4.84			
<b>Earhead/sq.m.</b>						
HD2932 (C)	384	6	366	4	375	5
HI1634 (C)	400	4	361	5	380	4
MP3336 (C)	415	3	382	3	398	3
HD2864 (C)	440	1	431	2	436	1
CG1029 (C)	391	5	341	6	366	6
HD3407	422	2	435	1	429	2
Mean	409		386		397	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	3.66	15.13	3.91		
Genotype (B)	**	6.81	16.61	4.20		
B within A	*	9.63	23.50			
A within B		9.53	23.24			
<b>Grains /earhead</b>						
HD2932 (C)	27.0	3	23.4	3	25.2	3
HI1634 (C)	28.9	2	26.5	1	27.7	2
MP3336 (C)	24.2	4	19.6	6	21.9	6
HD2864 (C)	24.1	5	22.3	4	23.2	4
CG1029 (C)	22.7	6	21.7	5	22.2	5
HD3407	35.5	1	24.2	2	29.9	1
Mean	27.1		23.0		25.0	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.33	1.35	5.54		
Genotype (B)	**	1.07	2.62	10.50		
B within A	*	1.52	3.70			
A within B		1.42	3.47			
<b>1000 grain wt, g</b>						
HD2932 (C)	44.47	2	37.68	5	41.08	3
HI1634 (C)	41.08	4	38.67	4	39.87	4
MP3336 (C)	38.55	5	40.05	3	39.30	5
HD2864 (C)	43.22	3	42.76	2	42.99	2
CG1029 (C)	48.74	1	52.58	1	50.66	1
HD3407	36.10	6	34.97	6	35.53	6
Mean	42.03		41.12		41.57	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.08	0.34	0.84		
Genotype (B)	**	0.22	0.53	1.27		
B within A	**	0.30	0.74			
A within B		0.29	0.71			
Date of Sowing:		06.12.2021		27.12.2021		
Date of Harvesting:		10.04.2022		19.04.2022		

<b>Table 4.4.7. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Udaipur</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	48.00	2	39.07	2	43.53	2	
HI1634 (C)	50.18	1	45.70	1	47.94	1	
MP3336 (C)	45.97	4	37.18	3	41.58	3	
HD2864 (C)	45.78	5	36.57	4	41.17	4	
CG1029 (C)	46.93	3	35.14	6	41.04	5	
HD3407	41.49	6	35.78	5	38.64	6	
Mean	46.39		38.24		42.32		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	0.93	3.83	9.29			
Genotype (B)	**	1.36	3.32	7.88			
B within A	N.S.	1.93	4.70				
A within B		1.99	4.85				
<b>Earhead/sq.m.</b>							
HD2932 (C)	365	3	274	4	319	3	
HI1634 (C)	378	1	280	1	329	1	
MP3336 (C)	367	2	280	1	324	2	
HD2864 (C)	338	5	279	3	309	4	
CG1029 (C)	335	6	265	6	300	6	
HD3407	343	4	274	4	309	4	
Mean	354		275		315		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	6.49	26.82	8.75			
Genotype (B)	N.S.	10.31	25.15	8.02			
B within A	N.S.	14.58	35.57				
A within B		14.81	36.13				
<b>Grains /earhead</b>							
HD2932 (C)	29.0	3	36.3	2	32.6	3	
HI1634 (C)	28.8	4	40.4	1	34.6	1	
MP3336 (C)	28.2	5	33.4	3	30.8	5	
HD2864 (C)	30.7	2	32.2	6	31.4	4	
CG1029 (C)	32.6	1	33.3	4	33.0	2	
HD3407	28.0	6	32.5	5	30.2	6	
Mean	29.5		34.7		32.1		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	0.84	3.47	11.09			
Genotype (B)	N.S.	1.51	3.68	11.52			
B within A	N.S.	2.14	5.21				
A within B		2.12	5.18				
<b>1000 grain wt, g</b>							
HD2932 (C)	45.57	2	39.65	6	42.61	2	
HI1634 (C)	46.47	1	40.42	3	43.44	1	
MP3336 (C)	44.55	3	39.83	4	42.19	4	
HD2864 (C)	44.12	4	40.80	1	42.46	3	
CG1029 (C)	43.94	5	39.77	5	41.85	6	
HD3407	43.56	6	40.43	2	42.00	5	
Mean	44.70		40.15		42.43		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.23	0.94	2.28			
Genotype (B)	N.S.	0.54	1.33	3.14			
B within A	N.S.	0.77	1.88				
A within B		0.74	1.80				
Date of Sowing:		04.12.2021		25.12.2021			
Date of Harvesting:		24.03.2022		06.04.2022			

<b>Table 4.4.8. Central Zone</b>		<b>IR-LS-DOS-TAS</b>		<b>Vijapur</b>		<b>2021-22</b>	
Genotype	Sowing Time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD2932 (C)	49.79	2	31.08	2	40.44	2	
HI1634 (C)	46.75	5	31.92	1	39.33	3	
MP3336 (C)	47.63	4	28.46	5	38.04	4	
HD2864 (C)	42.33	6	30.33	4	36.33	6	
CG1029 (C)	52.13	1	30.50	3	41.31	1	
HD3407	47.71	3	27.79	6	37.75	5	
Mean	47.72		30.01		38.87		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	1.30	5.36	14.16			
Genotype (B)	**	0.86	2.10	5.42			
B within A	**	1.22	2.97				
A within B		1.71	4.17				
<b>Earhead/sq.m.</b>							
HD2932 (C)	473	1	431	2	452	1	
HI1634 (C)	351	6	340	6	346	6	
MP3336 (C)	453	2	406	5	429	4	
HD2864 (C)	442	3	449	1	446	2	
CG1029 (C)	411	5	415	4	413	5	
HD3407	429	4	430	3	430	3	
Mean	427		412		419		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	9.76	40.30	9.88			
Genotype (B)	**	16.33	39.84	9.54			
B within A	N.S.	23.10	56.35				
A within B		23.23	56.68				
<b>Grains /earhead</b>							
HD2932 (C)	24.3	6	22.6	3	23.5	4	
HI1634 (C)	33.9	1	28.3	1	31.1	1	
MP3336 (C)	25.9	3	17.4	6	21.7	6	
HD2864 (C)	25.9	4	21.6	4	23.7	3	
CG1029 (C)	24.9	5	19.0	5	21.9	5	
HD3407	30.0	2	22.7	2	26.4	2	
Mean	27.5		21.9		24.7		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	N.S.	1.27	5.24	21.80			
Genotype (B)	**	1.33	3.24	13.17			
B within A	N.S.	1.88	4.58				
A within B		2.13	5.21				
<b>1000 grain wt, g</b>							
HD2932 (C)	43.76	2	32.15	4	37.95	3	
HI1634 (C)	39.90	4	33.26	3	36.58	4	
MP3336 (C)	40.72	3	41.01	1	40.87	2	
HD2864 (C)	37.65	5	31.52	5	34.58	5	
CG1029 (C)	51.25	1	38.76	2	45.01	1	
HD3407	37.59	6	28.89	6	33.24	6	
Mean	41.81		34.26		38.04		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	**	0.36	1.48	4.00			
Genotypes (B)	**	1.24	3.03	8.01			
B within A	*	1.76	4.29				
A within B		1.64	4.01				
Date of Sowing:		13.11.2021		04.12.2021			
Date of Harvesting:		03.03.2022		22.03.2022			

<b>Table 4.6.1. Central Zone</b>		<b>RIR-TS-TAD</b>				<b>Bilaspur</b>		<b>2021-22</b>	
Genotype	Irrigation level						Mean	Rk	
	Zero	Rk	One	Rk	Two	Rk			
<b>Yield, q/ha</b>									
MP3288 (C)	29.44	4	35.75	4	37.28	4	34.16	4	
HI1655	28.57	6	33.58	6	34.86	6	32.34	6	
DDW47(d)	27.76	7	32.74	7	34.31	7	31.60	7	
HI8823(l)	25.59	9	30.25	9	31.89	9	29.24	9	
CG1036	35.30	1	40.66	1	42.10	1	39.35	1	
DBW110 (C)	34.04	2	39.24	2	40.91	2	38.06	2	
HI8830(d)	30.89	3	37.37	3	38.37	3	35.54	3	
DDW55(d)	28.98	5	34.49	5	36.51	5	33.33	5	
HI8627(d)	26.12	8	31.58	8	33.34	8	30.35	8	
Mean	29.63		35.07		36.62		33.78		
	F. Test		SEm		CD (0.05)		CV (%)		
Irrigation (A)	*		0.96		2.89		14.76		
Genotype (B)	**		0.96		2.29		8.57		
B within A	N.S.		1.67		3.96				
A within B			1.84		4.37				
<b>Earhead/sq.m.</b>									
MP3288 (C)	310	4	325	4	337	5	324	4	
HI1655	308	6	323	6	333	6	321	6	
DDW47(d)	305	7	321	7	327	7	317	7	
HI8823(l)	302	9	316	9	325	9	314	9	
CG1036	333	1	336	1	345	1	338	1	
DBW110 (C)	327	2	331	2	342	2	333	2	
HI8830(d)	312	3	327	3	339	4	326	3	
DDW55(d)	308	5	324	5	339	3	324	5	
HI8627(d)	303	8	319	8	326	8	316	8	
Mean	312		324		335		324		
	F. Test		SEm		CD (0.05)		CV (%)		
Irrigation (A)	N.S.		5.97		18.00		9.58		
Genotype (B)	*		5.24		12.43		4.86		
B within A	N.S.		9.08		21.53				
A within B			10.44		24.75				
<b>Grains/earhead</b>									
MP3288 (C)	24.0	4	26.9	4	26.6	5	25.8	4	
HI1655	23.8	6	25.8	6	26.0	7	25.2	6	
DDW47(d)	23.2	8	25.6	7	26.0	8	24.9	8	
HI8823(l)	23.2	9	24.8	9	25.0	9	24.3	9	
CG1036	25.6	2	28.9	1	28.9	1	27.8	1	
DBW110 (C)	25.7	1	28.2	2	28.5	2	27.5	2	
HI8830(d)	24.7	3	27.6	3	27.2	3	26.5	3	
DDW55(d)	23.9	5	26.3	5	26.6	4	25.6	5	
HI8627(d)	23.5	7	25.3	8	26.1	6	25.0	7	
Mean	24.2		26.6		26.8		25.8		
	F. Test		SEm		CD (0.05)		CV (%)		
Irrigation (A)	N.S.		1.26		3.80		25.36		
Genotype (B)	N.S.		0.85		2.01		9.86		
B within A	N.S.		1.47		3.49				
A within B			1.88		4.45				

1000 grain wt, g								
MP3288 (C)	39.57	4	41.10	5	41.99	4	40.89	4
HI1655	39.33	6	40.42	6	40.46	6	40.07	6
DDW47(d)	39.10	7	39.92	7	40.43	7	39.82	7
HI8823(l)	36.90	8	38.68	9	39.42	8	38.33	9
CG1036	41.43	1	42.37	1	42.35	2	42.05	1
DBW110 (C)	41.07	2	42.15	2	42.42	1	41.88	2
HI8830(d)	40.11	3	41.67	3	42.06	3	41.28	3
DDW55(d)	39.50	5	41.24	4	40.64	5	40.46	5
HI8627(d)	36.88	9	39.33	8	39.22	9	38.48	8
Mean	39.32		40.76		41.00		40.36	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.55		1.66		7.09	
Genotype (B)	**		0.70		1.66		5.20	
B within A	N.S.		1.21		2.88			
A within B			1.27		3.01			
Date of Sowing:	30.10.2021							
Date of Harvesting:	10.03.2022							

**Table 4.6.2. Central Zone RIR-TS-TAD Durgapura 2021-22**

Genotype	Irrigations						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
MP3288 (C)	27.34	2	22.65	7	33.66	2	27.88	2
HI1655	18.25	6	26.55	4	29.70	4	24.84	6
DDW47(d)	16.69	7	31.53	1	27.07	6	25.85	4
HI8823(l)	29.42	1	22.68	6	33.84	1	28.65	1
CG1036	15.36	9	26.87	3	30.46	8	24.23	7
DBW110 (C)	22.91	4	26.01	5	26.03	8	24.98	5
HI8830(d)	16.14	8	22.15	8	26.58	7	21.63	9
DDW55(d)	25.02	3	19.53	9	22.41	9	22.32	8
HI8627(d)	20.05	5	31.11	2	27.47	5	26.21	3
Mean	21.24		25.45		28.58		25.09	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.73		2.21		15.16	
Genotype (B)	**		1.22		2.90		14.63	
B within A	**		2.12		5.03			
A within B			2.13		5.05			
<b>Earhead/sq.m.</b>								
MP3288 (C)	276	1	231	7	308	2	272	2
HI1655	200	6	269	3	290	3	253	4
DDW47(d)	193	7	301	1	264	6	253	5
HI8823(l)	276	1	236	6	310	1	274	1
CG1036	170	9	259	5	277	4	235	7
DBW110 (C)	235	4	262	4	257	7	252	6
HI8830(d)	183	8	229	8	255	8	222	9
DDW55(d)	257	3	213	9	233	9	234	8
HI8627(d)	218	5	291	2	277	5	262	3
Mean	223		255		275		251	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		5.88		17.72		12.17	
Genotype (B)	**		8.01		19.00		9.58	
B within A	**		13.88		32.91			
A within B			14.34		34.01			

Grains /earhead								
MP3288 (C)	27.9	2	23.8	8	26.6	2	26.1	3
HI1655	25.3	5	25.0	5	25.4	6	25.2	5
DDW47(d)	22.7	9	27.5	1	25.6	4	25.3	4
HI8823(l)	30.5	1	24.0	7	26.9	1	27.1	1
CG1036	25.5	4	26.5	3	26.4	3	26.1	2
DBW110 (C)	25.0	7	24.9	6	24.1	8	24.7	8
HI8830(d)	23.2	8	25.0	4	25.4	5	24.5	9
DDW55(d)	26.8	3	23.2	9	24.9	7	25.0	7
HI8627(d)	25.2	6	27.2	2	23.3	9	25.2	6
Mean	25.8		25.3		25.4		25.5	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.35		1.04		7.06	
Genotype (B)	N.S.		0.76		1.80		8.92	
B within A	*		1.31		3.11			
A within B			1.28		3.05			
1000 grain wt, g								
MP3288 (C)	35.53	7	41.03	1	41.27	4	39.28	3
HI1655	35.97	6	39.47	5	40.40	7	38.61	7
DDW47(d)	38.23	2	38.10	9	39.83	8	38.72	5
HI8823(l)	34.90	9	39.87	3	40.57	6	38.44	8
CG1036	35.47	8	39.23	7	41.37	3	38.69	6
DBW110 (C)	38.90	1	40.03	2	41.83	2	40.26	1
HI8830(d)	37.97	3	38.70	8	40.93	5	39.20	4
DDW55(d)	36.23	5	39.47	6	38.40	9	38.03	9
HI8627(d)	36.87	4	39.53	4	42.60	1	39.67	2
Mean	36.67		39.49		40.80		38.99	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.45		1.37		6.06	
Genotype (B)	N.S.		0.72		1.70		5.52	
B within A	N.S.		1.24		2.95			
A within B			1.26		2.98			
Date of Sowing:	20.11.2021							
Date of Harvesting:	24.03.2022							

Genotype	RIR-TS-TAD						Mean	Rk
	Irrigations							
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
MP3288 (C)	32.63	9	37.43	9	43.17	9	37.74	9
HI1655	37.23	7	41.70	5	54.07	2	44.33	2
DDW47(d)	38.93	5	41.63	6	45.30	7	41.96	6
HI8823(l)	33.10	8	43.73	2	50.37	3	42.40	5
CG1036	37.50	6	42.40	4	43.43	8	41.11	7
DBW110 (C)	39.23	4	38.30	8	45.80	6	41.11	7
HI8830(d)	41.87	1	52.07	1	54.43	1	49.46	1
DDW55(d)	39.33	3	43.43	3	49.93	4	44.23	3
HI8627(d)	39.80	2	40.03	7	48.33	5	42.72	4
Mean	37.74		42.30		48.31		42.79	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.51		1.54		6.20	
Genotype (B)	**		0.73		1.72		5.10	
B within A	**		1.26		2.98			
A within B			1.29		3.06			

<b>Earhead/sq.m.</b>								
MP3288 (C)	250	5	258	6	271	5	259	5
HI1655	254	4	256	7	296	3	269	3
DDW47(d)	218	9	264	4	248	9	243	9
HI8823(l)	240	7	273	2	273	4	262	4
CG1036	290	1	337	1	333	1	320	1
DBW110 (C)	248	6	231	9	256	7	245	8
HI8830(d)	256	3	259	5	311	2	275	2
DDW55(d)	236	8	265	3	261	6	254	6
HI8627(d)	260	2	245	8	253	8	253	7
Mean	250		265		278		264	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		2.37		7.16		4.66	
Genotype (B)	**		5.32		12.62		6.04	
B within A	**		9.22		21.86			
A within B			9.01		21.36			
<b>Grains /earhead</b>								
MP3288 (C)	29.3	6	34.5	4	36.5	5	33.4	6
HI1655	29.7	5	35.2	3	36.8	4	33.9	4
DDW47(d)	37.2	1	32.9	7	38.2	3	36.1	2
HI8823(l)	25.6	9	33.1	6	35.5	6	31.4	7
CG1036	26.2	8	24.9	9	25.3	9	25.5	9
DBW110 (C)	31.6	2	38.0	2	39.5	2	36.4	1
HI8830(d)	30.1	4	38.4	1	32.3	8	33.6	5
DDW55(d)	28.3	7	29.2	8	32.8	7	30.1	8
HI8627(d)	30.3	3	34.3	5	40.3	1	35.0	3
Mean	29.8		33.4		35.3		32.8	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.47		1.43		7.51	
Genotype (B)	**		0.88		2.08		8.03	
B within A	**		1.52		3.61			
A within B			1.51		3.58			
<b>1000 grain wt, g</b>								
MP3288 (C)	44.73	9	42.27	9	43.77	9	43.59	9
HI1655	49.37	6	46.37	7	49.80	5	48.51	6
DDW47(d)	48.23	8	47.93	5	47.90	6	48.02	7
HI8823(l)	53.97	3	48.47	4	52.00	3	51.48	3
CG1036	49.37	6	50.50	3	51.93	4	50.60	4
DBW110 (C)	50.60	5	43.63	8	45.37	8	46.53	8
HI8830(d)	54.33	2	52.37	2	54.37	2	53.69	2
DDW55(d)	58.97	1	56.20	1	58.50	1	57.89	1
HI8627(d)	51.07	4	47.73	6	47.53	7	48.78	5
Mean	51.18		48.39		50.13		49.90	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.20		0.60		2.09	
Genotype (B)	**		0.27		0.64		1.64	
B within A	**		0.47		1.12			
A within B			0.49		1.16			
Date of Sowing:	31.10.2021							
Date of Harvesting:	22.03.2022							



<b>Table 4.6.4. Central Zone</b>		<b>RIR-TS-TAD</b>		<b>Jabalpur</b>		<b>2021-22</b>		
Genotype	Irrigations						Mean	Rk
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
MP3288 (C)	31.30	3	36.66	4	37.66	5	35.21	4
HI1655	29.62	5	35.00	6	37.32	7	33.98	6
DDW47(d)	28.41	7	32.70	7	33.77	8	31.63	8
HI8823(l)	26.93	9	29.77	9	31.53	9	29.41	9
CG1036	34.58	2	41.04	1	41.17	2	38.93	2
DBW110 (C)	35.21	1	40.66	2	42.13	1	39.34	1
HI8830(d)	30.70	4	38.29	3	39.08	3	36.02	3
DDW55(d)	29.03	6	35.92	5	37.65	6	34.20	5
HI8627(d)	27.19	8	32.09	8	38.36	4	32.55	7
Mean	30.33		35.79		37.63		34.58	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.65		1.96		9.75	
Genotype (B)	**		1.08		2.56		9.35	
B within A	N.S.		1.87		4.43			
A within B			1.88		4.45			
<b>Earhead/sq.m.</b>								
MP3288 (C)	191	3	224	4	230	5	215	4
HI1655	181	6	213	6	228	7	207	6
DDW47(d)	188	4	199	7	206	8	198	8
HI8823(l)	171	8	182	9	192	9	182	9
CG1036	211	2	250	1	251	2	237	2
DBW110 (C)	215	1	248	2	257	1	240	1
HI8830(d)	187	5	234	3	238	3	220	3
DDW55(d)	180	7	219	5	230	6	210	5
HI8627(d)	166	9	196	8	234	4	199	7
Mean	188		218		230		212	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		4.63		13.95		11.34	
Genotype (B)	**		6.14		14.55		8.69	
B within A	N.S.		10.63		25.21			
A within B			11.04		26.18			
<b>Grains /earhead</b>								
MP3288 (C)	41.3	5	39.5	5	39.2	7	40.0	7
HI1655	41.0	6	39.4	7	42.0	3	40.8	5
DDW47(d)	42.3	3	38.7	8	38.8	8	39.9	8
HI8823(l)	43.2	2	41.9	3	40.3	6	41.8	2
CG1036	39.2	9	37.7	9	37.1	9	38.0	9
DBW110 (C)	40.1	7	41.9	2	40.4	5	40.8	4
HI8830(d)	39.3	8	40.3	4	40.8	4	40.2	6
DDW55(d)	41.7	4	39.5	6	42.1	2	41.1	3
HI8627(d)	43.3	1	42.5	1	43.8	1	43.2	1
Mean	41.3		40.1		40.5		40.6	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.40		1.20		5.08	
Genotype (B)	N.S.		1.02		2.42		7.52	
B within A	N.S.		1.76		4.18			
A within B			1.71		4.06			

1000 grain wt, g								
MP3288 (C)	39.75	5	41.52	5	41.91	3	41.06	2
HI1655	40.07	4	41.75	3	39.19	7	40.34	4
DDW47(d)	36.03	9	42.41	2	42.42	2	40.28	6
HI8823(l)	36.58	8	39.36	7	40.74	4	38.89	8
CG1036	41.86	1	43.58	1	44.30	1	43.25	1
DBW110 (C)	41.08	3	39.19	8	40.58	5	40.28	5
HI8830(d)	41.74	2	40.75	6	40.19	6	40.89	3
DDW55(d)	38.69	6	41.74	4	38.91	8	39.78	7
HI8627(d)	37.91	7	38.69	9	37.52	9	38.04	9
Mean	39.30		41.00		40.64		40.31	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.24		0.71		3.04	
Genotype (B)	**		0.81		1.92		6.01	
B within A	N.S.		1.40		3.32			
A within B			1.34		3.18			
Date of Sowing:	06.11.2021							
Date of Harvesting:	20.03.2022							

Table 4.6.5. Central Zone			RIR-TS-TAD				Powarkheda 2021-22	
Irrigations								
	Zero	Rk	One	Rk	Two	Rk	Mean	Rk
Yield, q/ha								
MP3288 (C)	25.32	4	31.63	4	33.15	4	30.03	4
HI1655	24.45	6	29.46	6	30.73	6	28.21	6
DDW47(d)	23.63	7	28.62	7	30.19	7	27.48	7
HI8823(l)	21.46	9	26.13	9	27.77	9	25.12	9
CG1036	29.92	2	35.11	2	36.78	2	33.94	2
DBW110 (C)	31.18	1	36.54	1	37.98	1	35.23	1
HI8830(d)	26.77	3	33.25	3	34.25	3	31.42	3
DDW55(d)	22.00	8	27.45	8	29.22	8	26.22	8
HI8627(d)	24.86	5	30.37	5	32.39	5	29.21	5
Mean	25.51		30.95		32.50		29.65	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.96		2.89		16.82	
Genotype (B)	**		0.96		2.29		9.76	
B within A	N.S.		1.67		3.96			
A within B			1.84		4.37			
Earhead/sq.m.								
MP3288 (C)	315	4	329	4	341	5	328	4
HI1655	312	6	327	6	337	6	326	5
DDW47(d)	309	7	325	7	331	7	322	8
HI8823(l)	306	9	321	9	329	9	319	9
CG1036	324	2	333	2	346	2	335	2
DBW110 (C)	332	1	335	1	347	1	338	1
HI8830(d)	316	3	331	3	343	4	330	3
DDW55(d)	308	8	323	8	343	3	325	6
HI8627(d)	313	5	328	5	330	8	324	7
Mean	315		328		339		327	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		6.04		18.20		9.59	
Genotype (B)	N.S.		4.90		11.63		4.50	
B within A	N.S.		8.49		20.15			
A within B			10.03		23.79			

Grains /earhead								
MP3288 (C)	19.8	4	22.8	4	22.7	5	21.8	5
HI1655	19.5	6	21.7	6	22.0	6	21.1	6
DDW47(d)	18.9	7	21.4	7	21.9	7	20.8	7
HI8823(l)	18.6	9	20.5	9	20.9	9	20.0	9
CG1036	23.1	1	25.3	2	24.0	2	24.1	2
DBW110 (C)	22.6	2	25.3	1	25.3	1	24.4	1
HI8830(d)	20.6	3	23.6	3	23.4	4	22.5	3
DDW55(d)	18.9	8	21.1	8	21.2	8	20.4	8
HI8627(d)	19.7	5	22.2	5	23.6	3	21.8	4
Mean	20.2		22.7		22.8		21.9	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		1.18		3.56		28.07	
Genotype (B)	**		0.76		1.81		10.46	
B within A	N.S.		1.32		3.13			
A within B			1.72		4.07			
1000 grain wt, g								
MP3288 (C)	40.69	3	42.22	4	43.11	4	42.01	4
HI1655	40.45	5	41.54	6	41.58	6	41.19	6
DDW47(d)	40.22	7	41.04	7	41.55	7	40.94	7
HI8823(l)	38.02	8	39.80	9	40.54	8	39.45	9
CG1036	40.22	6	41.83	5	44.47	1	42.17	3
DBW110 (C)	42.19	1	43.27	1	43.54	2	43.00	1
HI8830(d)	41.23	2	42.79	2	43.18	3	42.40	2
DDW55(d)	38.00	9	40.45	8	40.34	9	39.60	8
HI8627(d)	40.62	4	42.36	3	41.76	5	41.58	5
Mean	40.18		41.70		42.23		41.37	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.62		1.87		7.80	
Genotype (B)	**		0.71		1.68		5.15	
B within A	N.S.		1.23		2.92			
A within B			1.32		3.12			
Date of Sowing:	07.11.2021							
Date of Harvesting:	15.03.2022							

Genotype	RIR-TS-TAD						Mean	Rk
	Irrigations							
	Zero	Rk	One	Rk	Two	Rk		
<b>Yield, q/ha</b>								
MP3288 (C)	36.61	1	37.55	3	40.28	3	38.13	2
HI1655	30.66	4	34.65	6	35.80	8	33.71	6
DDW47(d)	28.32	9	27.87	9	37.87	7	31.35	9
HI8823(l)	30.11	5	36.56	5	38.18	5	34.95	4
CG1036	31.97	2	39.17	2	42.23	2	37.79	3
DBW110 (C)	29.19	6	36.60	4	38.14	6	34.64	5
HI8830(d)	31.06	3	41.00	1	46.99	1	39.68	1
DDW55(d)	28.40	7	33.44	8	33.38	9	31.64	8
HI8627(d)	28.40	7	33.58	7	38.90	4	33.63	7
Mean	30.53		35.57		39.09		35.06	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.55		1.66		8.15	
Genotype (B)	**		0.86		2.05		7.39	
B within A	**		1.50		3.55			
A within B			1.51		3.59			

<b>Earhead/sq.m.</b>								
MP3288 (C)	283	2	303	4	337	3	308	4
HI1655	273	6	297	6	322	6	297	7
DDW47(d)	265	8	378	1	293	9	312	3
HI8823(l)	277	4	310	3	335	4	307	5
CG1036	282	3	302	5	365	2	316	2
DBW110 (C)	275	5	297	6	328	5	300	6
HI8830(d)	288	1	313	2	375	1	326	1
DDW55(d)	265	8	273	9	310	8	283	9
HI8627(d)	272	7	278	8	322	6	291	8
Mean	276		306		332		304	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		3.69		11.12		6.29	
Genotype (B)	**		5.48		13.00		5.40	
B within A	**		9.50		22.52			
A within B			9.68		22.96			
<b>Grains /earhead</b>								
MP3288 (C)	30.0	1	28.3	4	25.0	6	27.8	1
HI1655	26.5	3	27.7	6	25.2	5	26.5	4
DDW47(d)	27.4	2	17.6	9	30.8	1	25.3	9
HI8823(l)	25.8	6	27.6	7	24.3	8	25.9	7
CG1036	26.0	5	28.1	5	24.1	9	26.1	6
DBW110 (C)	25.2	7	28.5	1	25.8	3	26.5	3
HI8830(d)	23.1	9	27.4	8	25.5	4	25.3	8
DDW55(d)	26.1	4	28.4	3	25.0	7	26.5	5
HI8627(d)	25.1	8	28.4	2	27.5	2	27.0	2
Mean	26.1		26.9		25.9		26.3	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.75		2.25		14.71	
Genotype (B)	N.S.		1.04		2.47		11.90	
B within A	**		1.81		4.29			
A within B			1.86		4.41			
<b>1000 grain wt, g</b>								
MP3288 (C)	43.14	4	44.49	3	48.15	2	45.26	3
HI1655	42.52	5	42.31	8	44.23	6	43.02	6
DDW47(d)	39.10	9	41.69	9	41.98	9	40.92	9
HI8823(l)	43.30	3	43.69	4	47.07	4	44.69	4
CG1036	43.98	2	46.71	2	48.14	3	46.28	2
DBW110 (C)	42.20	6	43.26	5	45.15	5	43.54	5
HI8830(d)	46.75	1	47.81	1	49.31	1	47.96	1
DDW55(d)	41.21	8	42.82	6	43.36	8	42.46	8
HI8627(d)	42.07	7	42.48	7	43.93	7	42.83	7
Mean	42.70		43.92		45.70		44.11	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	*		0.52		1.58		6.16	
Genotype (B)	**		0.89		2.12		6.07	
B within A	N.S.		1.55		3.66			
A within B			1.55		3.67			
Date of Sowing:			10.11.2021					
Date of Harvesting:			11.03.2022					

Table 4.8.1 Central Zone		SPL-IR-ES-HYPT		Powarkheda 2021-22		
Genotype	Nutrient Management				Mean	Rk
	NM1	Rk	NM2	Rk		
<b>Yield, q/ha</b>						
GW322	46.67	2	49.66	4	48.17	3
DBW187	47.25	1	52.89	1	50.07	1
DBW303	45.89	3	52.79	2	49.34	2
DBW372	45.62	4	50.03	3	47.83	4
Mean	46.36		51.34		48.85	
	F. Test	SEm	CD (0.05)	CV (%)		
Nutrient Mgt (A)	**	0.06	0.26	0.45		
Genotype (B)	**	0.07	0.18	0.36		
B within A	**	0.10	0.25			
A within B		0.11	0.27			
<b>Earhead/sq.m.</b>						
GW322	367	2	423	2	410	2
DBW187	450	1	482	1	466	1
DBW303	287	4	382	4	334	4
DBW372	375	3	412	3	393	3
Mean	377		425		401	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	5.33	22.00	4.60		
Genotype (B)	**	2.37	5.97	1.45		
B within A	**	3.35	8.44			
A within B		6.07	15.29			
<b>Grains /earhead</b>						
GW322	28.8	3	25.5	3	27.2	3
DBW187	24.7	4	21.7	4	23.2	4
DBW303	42.2	1	34.2	1	38.2	1
DBW372	30.8	2	29.0	2	29.9	2
Mean	31.6		27.6		29.6	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.33	1.36	3.85		
Genotype (B)	**	0.31	0.78	2.55		
B within A	**	0.44	1.10			
A within B		0.50	1.26			
<b>1000 grain wt, g</b>						
GW322	40.87	2	45.97	2	43.42	2
DBW187	42.50	1	50.67	1	46.58	1
DBW303	37.98	4	40.55	4	39.27	4
DBW372	39.50	3	41.95	3	40.73	3
Mean	40.21		44.78		42.50	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.05	0.23	0.44		
Genotype (B)	**	0.08	0.19	0.44		
B within A	**	0.11	0.27			
A within B		0.11	0.27			
<b>Plant Height, cm</b>						
GW322	91.7	4	76.0	3	83.8	4
DBW187	98.0	2	80.7	1	89.3	1
DBW303	100.3	1	75.0	4	87.7	2
DBW372	96.0	3	78.0	2	87.0	3
Mean	96.5		77.4		87.0	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.51	2.12	2.05		
Genotype (B)	**	0.89	2.25	2.51		
B within A	**	1.26	3.18			
A within B		1.21	3.04			

<b>Biomass, q/ha</b>						
GW322	161.39	3	174.64	3	168.02	4
DBW187	177.77	1	190.85	1	184.31	1
DBW303	156.56	4	182.82	2	169.69	3
DBW372	177.49	2	171.32	4	174.40	2
Mean	168.30		179.91		174.10	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	5.80	23.95	11.54		
Genotype (B)	N.S.	4.65	11.72	6.54		
B within A	N.S.	6.58	16.58			
A within B		8.13	20.49			
<b>Physiological Maturity, Days</b>						
GW322	116	3	118	3	117	4
DBW187	115	4	120	1	118	3
DBW303	119	1	118	4	118	2
DBW372	117	2	120	1	119	1
Mean	116.75		119.17		117.96	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.93	3.82	2.72		
Genotype (B)	N.S.	0.72	1.81	1.50		
B within A	*	1.02	2.57			
A within B		1.28	3.22			
Date of Sowing:		07.11.2021		25.03.2022		
Date of Harvesting:		25.03.2022				

<b>Table 4.8.2. Central Zone</b>	<b>SPL-IR-ES-HYPT</b>				<b>BISA Jabalpur 2021-22</b>	
Genotype	Nutrient Management				Mean	Rk
	NM1	Rk	NM2	Rk		
<b>Yield, q/ha</b>						
GW322	75.25	1	80.00	3	77.63	2
DBW187	75.01	2	82.40	2	78.71	1
DBW303	69.49	4	83.46	1	76.47	3
DBW372	73.75	3	72.15	4	72.95	4
Mean	73.38		79.50		76.44	
	F. Test	SEm	CD (0.05)	CV (%)		
Nutrient Mgt (A)	N.S.	2.48	10.26	11.26		
Genotype (B)	N.S.	2.51	6.32	8.04		
B within A	N.S.	3.55	8.94			
A within B		3.95	9.95			
<b>Earhead/sq.m.</b>						
GW322	400	2	451	1	426	2
DBW187	364	4	436	3	400	3
DBW303	370	3	426	4	398	4
DBW372	423	1	443	2	433	1
Mean	389		439		414	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	4.90	20.23	4.10		
Genotype (B)	N.S.	14.66	36.94	8.67		
B within A	N.S.	20.73	52.25			
A within B		18.61	46.90			
<b>Grains /earhead</b>						
GW322	48.5	1	40.5	3	44.5	2
DBW187	44.1	3	44.1	2	44.1	3
DBW303	45.7	2	49.9	1	47.8	1
DBW372	39.6	4	38.5	4	39.1	4
Mean	44.5		43.3		43.9	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	2.02	8.35	15.98		
Genotype (B)	N.S.	2.03	5.11	11.33		
B within A	N.S.	2.87	7.23			
A within B		3.20	8.08			

1000 grain wt, g						
GW322	39.13	4	43.77	1	41.45	3
DBW187	47.17	1	43.10	2	45.13	1
DBW303	41.73	3	39.23	4	40.48	4
DBW372	44.47	2	42.70	3	43.58	2
Mean	43.13		42.20		42.66	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.43	1.76	3.47		
Genotype (B)	**	0.41	1.04	2.37		
B within A	**	0.58	1.47			
A within B		0.66	1.67			
Plant Height, cm						
GW322	100.4	4	92.4	3	96.4	4
DBW187	102.6	3	91.0	4	96.8	3
DBW303	104.0	1	93.1	2	98.6	2
DBW372	102.9	2	96.1	1	99.5	1
Mean	102.5		93.2		97.8	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.37	1.52	1.30		
Genotype (B)	N.S.	1.07	2.69	2.67		
B within A	N.S.	1.51	3.80			
A within B		1.36	3.42			
Biomass, q/ha						
GW322	143.42	3	157.67	2	150.55	2
DBW187	146.18	2	150.51	3	148.35	3
DBW303	157.63	1	167.13	1	162.38	1
DBW372	137.53	4	143.09	4	140.31	4
Mean	146.19		154.60		150.40	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.33	1.35	0.76		
Genotype (B)	**	1.76	4.44	2.87		
B within A	N.S.	2.49	6.28			
A within B		2.18	5.50			
Physiological Maturity						
GW322	128	4	129	4	129	4
DBW187	129	3	131	2	130	3
DBW303	129	2	130	3	130	2
DBW372	135	1	136	1	135	1
Mean	130.17		131.42		130.79	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.81	3.35	2.15		
Genotype (B)	**	0.50	1.25	0.93		
B within A	N.S.	0.70	1.77			
A within B		1.01	2.55			
Date of Sowing:	10.11.2021					
Date of Harvesting:	04.04.2022					

Table 4.8.3. Central Zone		SPL-IR-ES-HYPT		Jabalpur	2021-22	
Genotype	Nutrient Management				Mean	Rk
	NM1	Rk	NM2	Rk		
Yield, q/ha						
GW322	74.01	1	80.14	2	77.07	2
DBW187	69.50	3	77.11	3	73.31	3
DBW303	73.40	2	82.43	1	77.92	1
DBW372	62.66	4	69.19	4	65.92	4
Mean	69.89		77.22		73.55	
	F. Test	SEm	CD (0.05)	CV (%)		
Nutrient Mgt (A)	N.S.	1.57	6.49	7.40		
Genotype (B)	**	1.25	3.14	4.15		
B within A	N.S.	1.76	4.44			
A within B		2.19	5.52			

<b>Earhead/sq.m.</b>						
GW322	421	2	427	3	424	3
DBW187	449	1	451	2	450	1
DBW303	369	4	486	1	427	2
DBW372	379	3	406	4	392	4
Mean	405		442		424	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	2.05	8.45	1.67		
Genotype (B)	**	2.43	6.12	1.40		
B within A	**	3.43	8.65			
A within B		3.61	9.09			
<b>Grains /earhead</b>						
GW322	35.2	2	36.3	2	35.8	2
DBW187	28.6	4	31.5	4	30.0	4
DBW303	44.7	1	37.3	1	41.0	1
DBW372	34.9	3	36.1	3	35.5	3
Mean	35.9		35.3		35.6	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.61	2.52	5.94		
Genotype (B)	**	1.28	3.24	8.85		
B within A	*	1.82	4.58			
A within B		1.69	4.25			
<b>1000 grain wt, g</b>						
GW322	50.20	2	51.90	2	51.05	2
DBW187	54.06	1	54.43	1	54.24	1
DBW303	44.57	4	45.53	4	45.05	4
DBW372	47.68	3	47.20	3	47.44	3
Mean	49.13		49.77		49.45	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.20	0.83	1.41		
Genotype (B)	**	1.15	2.90	5.70		
B within A	N.S.	1.63	4.10			
A within B		1.42	3.58			
<b>Plant Height, cm</b>						
GW322	98.2	4	94.6	3	96.4	4
DBW187	105.9	1	93.0	4	99.4	2
DBW303	104.6	2	96.6	1	100.6	1
DBW372	102.4	3	95.5	2	98.9	3
Mean	102.7		94.9		98.8	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.43	1.79	1.52		
Genotype (B)	*	0.83	2.10	2.06		
B within A	*	1.18	2.96			
A within B		1.11	2.79			
<b>Biomass, q/ha</b>						
GW322	143.42	3	157.67	2	150.55	2
DBW187	146.18	2	150.51	3	148.35	3
DBW303	157.63	1	167.13	1	162.38	1
DBW372	137.53	4	143.09	4	140.31	4
Mean	146.19		154.60		150.40	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	**	0.33	1.35	0.76		
Genotype (B)	**	1.76	4.44	2.87		
B within A	N.S.	2.49	6.28			
A within B		2.18	5.50			



Physiological Maturity						
GW322	125	4	125	4	125	4
DBW187	128	2	128	2	128	2
DBW303	128	2	128	2	128	2
DBW372	134	1	134	1	134	1
Mean	128.75		128.83		128.79	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.16	0.64	0.42		
Genotype (B)	**	0.26	0.66	0.50		
B within A	N.S.	0.37	0.94			
A within B		0.36	0.90			
Date of Sowing:	05.11.2021					
Date of Harvesting:	12.04.2022					

Table 4.8.4. Central Zone		SPL-IR-ES-HYPT			Udaipur	2021-22
Genotype	Nutrient Management				Mean	Rk
	NM1	Rk	NM2	Rk		
<b>Yield, q/ha</b>						
GW322	54.57	1	65.28	1	59.93	1
DBW187	53.21	2	63.72	2	58.46	2
DBW303	52.02	3	59.84	3	55.93	3
DBW372	48.28	4	58.82	4	53.55	4
Mean	52.02		61.91		56.97	
	F. Test	SEm	CD (0.05)	CV (%)		
Nutrient Mgt (A)	*	0.95	3.93	5.78		
Genotype (B)	**	1.00	2.53	4.32		
B within A	N.S.	1.42	3.58			
A within B		1.55	3.92			
<b>Earhead/sq.m.</b>						
GW322	402	2	407	4	404	2
DBW187	357	4	448	1	403	3
DBW303	380	3	413	3	397	4
DBW372	413	1	415	2	414	1
Mean	388		421		404	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	7.15	29.51	6.12		
Genotype (B)	N.S.	9.70	24.45	5.88		
B within A	*	13.72	34.58			
A within B		13.87	34.95			
<b>Grains /earhead</b>						
GW322	28.6	3	33.8	1	31.2	1
DBW187	32.2	1	30.0	4	31.1	3
DBW303	30.5	2	31.7	2	31.1	2
DBW372	26.6	4	31.6	3	29.1	4
Mean	29.5		31.8		30.6	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.61	2.53	6.94		
Genotype (B)	N.S.	0.68	1.72	5.47		
B within A	**	0.97	2.44			
A within B		1.04	2.61			
<b>1000 grain wt, g</b>						
GW322	47.49	1	47.59	1	47.54	1
DBW187	46.53	2	47.43	2	46.98	2
DBW303	45.11	3	45.73	3	45.42	3
DBW372	44.18	4	44.95	4	44.57	4
Mean	45.83		46.43		46.13	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.66	2.72	4.95		
Genotype (B)	N.S.	0.84	2.12	4.47		
B within A	N.S.	1.19	3.00			
A within B		1.22	3.08			

<b>Plant Height, cm</b>						
GW322	87.3	1	94.8	1	91.1	1
DBW187	85.7	2	93.8	2	89.8	2
DBW303	84.8	3	91.3	4	88.1	3
DBW372	83.2	4	92.8	3	88.0	4
Mean	85.3		93.2		89.2	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	1.00	4.13	3.88		
Genotype (B)	N.S.	1.36	3.44	3.74		
B within A	N.S.	1.93	4.86			
A within B		1.95	4.91			
<b>Biomass, q/ha</b>						
GW322	154.67	1	164.90	1	159.78	1
DBW187	137.33	2	154.67	2	146.00	2
DBW303	128.17	3	153.00	3	140.58	3
DBW372	127.50	4	144.52	4	136.01	4
Mean	136.92		154.27		145.59	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	2.80	11.56	6.66		
Genotype (B)	**	2.74	6.92	4.62		
B within A	N.S.	3.88	9.78			
A within B		4.37	11.02			
<b>Physiological Maturity</b>						
GW322	121	4	126	1	124	3
DBW187	122	2	125	2	124	2
DBW303	122	3	124	4	123	4
DBW372	124	1	125	2	125	1
Mean	122.33		125.00		123.67	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.79	3.27	2.22		
Genotype (B)	N.S.	0.98	2.46	1.93		
B within A	N.S.	1.38	3.48			
A within B		1.43	3.61			
Date of Sowing:		11.11.2021				
Date of Harvesting:		18.03.2022				

<b>Table 4.8.5. Central Zone</b>		<b>SPL-IR-ES-HYPT</b>		<b>Vijapur</b>		<b>2021-22</b>	
Genotype	Nutrient Management				Mean	Rk	
	NM1	Rk	NM2	Rk			
<b>Yield, q/ha</b>							
GW322	54.21	2	60.83	2	57.52	2	
DBW187	52.31	4	59.08	4	55.70	4	
DBW303	52.71	3	60.13	3	56.42	3	
DBW372	55.71	1	65.79	1	60.75	1	
Mean	53.73		61.46		57.60		
	F. Test	SEm	CD (0.05)	CV (%)			
Nutrient Mgt (A)	*	1.19	4.93	7.18			
Genotype (B)	N.S.	2.28	5.75	9.71			
B within A	N.S.	3.23	8.14				
A within B		3.04	7.66				
<b>Earhead/sq.m.</b>							
GW322	376	3	463	1	420	2	
DBW187	388	1	445	3	416	3	
DBW303	342	4	406	4	374	4	
DBW372	380	2	462	2	421	1	
Mean	372		444		408		
	F. Test	SEm	CD (0.05)	CV (%)			
Date of sowing (A)	*	7.59	31.34	6.45			
Genotype (B)	*	11.50	28.97	6.91			
B within A	N.S.	16.26	40.97				
A within B		16.00	40.31				

<b>Grains /earhead</b>						
GW322	29.6	3	28.0	3	28.8	3
DBW187	26.3	4	24.7	4	25.5	4
DBW303	36.5	1	33.9	1	35.2	1
DBW372	31.9	2	30.9	2	31.4	2
Mean	31.1		29.4		30.2	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	1.63	6.75	18.71		
Genotype (B)	**	1.69	4.25	13.67		
B within A	N.S.	2.39	6.02			
A within B		2.63	6.64			
<b>1000 grain wt, g</b>						
GW322	49.87	2	46.88	2	48.38	2
DBW187	51.74	1	54.09	1	52.92	1
DBW303	42.24	4	43.70	4	42.97	4
DBW372	45.86	3	46.47	3	46.16	3
Mean	47.43		47.79		47.61	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.85	3.52	6.20		
Genotype (B)	**	0.82	2.06	4.21		
B within A	N.S.	1.16	2.92			
A within B		1.32	3.32			
<b>Plant Height, cm</b>						
GW322	84.1	4	82.7	4	83.4	4
DBW187	93.8	1	86.9	1	90.4	1
DBW303	86.4	3	86.0	2	86.2	3
DBW372	93.4	2	84.3	3	88.9	2
Mean	89.4		85.0		87.2	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	0.45	1.86	1.79		
Genotype (B)	**	0.78	1.96	2.19		
B within A	**	1.10	2.78			
A within B		1.06	2.66			
<b>Biomass, q/ha</b>						
GW322	115.25	4	135.92	4	125.58	4
DBW187	117.00	2	138.33	2	127.67	2
DBW303	115.50	3	136.96	3	126.23	3
DBW372	133.42	1	149.17	1	141.29	1
Mean	120.29		140.09		130.19	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	*	2.19	9.04	5.82		
Genotype (B)	N.S.	4.95	12.47	9.31		
B within A	N.S.	7.00	17.63			
A within B		6.44	16.24			
<b>Physiological Maturity</b>						
GW322	102	3	104	2	103	3
DBW187	102	3	102	4	102	4
DBW303	103	2	104	2	104	2
DBW372	108	1	109	1	109	1
Mean	104.08		104.67		104.38	
	F. Test	SEm	CD (0.05)	CV (%)		
Date of sowing (A)	N.S.	0.12	0.49	0.39		
Genotype (B)	**	0.22	0.54	0.50		
B within A	N.S.	0.30	0.77			
A within B		0.29	0.73			
Date of Sowing:	04.11.2021					
Date of Harvesting:	03.03.2022					

Table 5.2.1. Peninsular Zone		IR-TS-DOS-TAD		Akola		2021-22	
Genotype	Sowing time				Mean	Rk	
	Timely	Rk	Late	Rk			
<b>Yield, q/ha</b>							
MACS4100(d)	38.63	5	56.96	3	47.80	5	
HI8826(d)	56.49	1	46.29	5	51.39	3	
GW322 (C)	50.99	2	58.13	2	54.56	1	
MACS3949(d)(C)	48.23	3	58.89	1	53.56	2	
DDW48(d)(C)	47.16	4	54.92	4	51.04	4	
Mean	48.30		55.04		51.67		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		1.45		5.99	10.87	
Genotype (B)	N.S.		2.04		5.37	9.67	
B within A	**		2.08		6.98	5.57	
A within B			2.35		7.91		
<b>Earheads/sqm</b>							
MACS4100(d)	397	5	445	5	421	5	
HI8826(d)	487	1	480	2	483	1	
GW322 (C)	445	3	482	1	463	3	
MACS3949(d)(C)	430	4	450	4	440	4	
DDW48(d)(C)	487	1	475	3	481	2	
Mean	449		466		458		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		11.03		45.56	9.34	
Genotype (B)	N.S.		14.58		38.36	7.80	
B within A	N.S.		26.62		76.88	10.25	
A within B			24.07		69.52		
<b>Grains/Earhead</b>							
MACS4100(d)	33.52	1	30.95	4	32.23	2	
HI8826(d)	25.21	4	19.57	5	22.39	5	
GW322 (C)	32.60	2	31.89	1	32.24	1	
MACS3949(d)(C)	29.96	3	31.62	2	30.79	3	
DDW48(d)(C)	23.20	5	31.57	3	27.38	4	
Mean	28.90		29.12		29.01		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		1.22		5.03	16.26	
Genotype (B)	**		0.93		2.45	7.86	
B within A	N.S.		2.19		6.78	12.15	
A within B			1.71		5.30		
<b>1000 Grains Weight, g</b>							
MACS4100(d)	29.80	5	41.43	3	35.62	5	
HI8826(d)	46.70	1	49.57	1	48.13	1	
GW322 (C)	35.70	4	37.93	4	36.82	4	
MACS3949(d)(C)	37.60	3	41.57	2	39.58	2	
DDW48(d)(C)	42.07	2	36.93	5	39.50	3	
Mean	38.37		41.49		39.93		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	*		0.23		0.94	2.21	
Genotype (B)	**		0.15		0.41	0.95	
B within A	**		0.46		1.39	1.95	
A within B			0.35		1.06		
Date of Sowing:	10.11.2021		26.11.2021				
Date of Harvesting:	29.03.2022		06.04.2022				

Table 5.2.2. Peninsular Zone		IR-TS-DOS-TAD		Dharwad		2021-22	
Genotype	Sowing time				Mean	Rk	
	Timely	Rk	Late	Rk			
<b>Yield, q/ha</b>							
MACS4100(d)	40.29	3	38.15	2	39.22		2
HI8826(d)	44.57	1	37.03	4	40.80		1
GW322 (C)	40.71	2	37.60	3	39.16		3
MACS3949(d)(C)	37.47	5	39.87	1	38.64		4
DDW48(d)(C)	38.32	4	36.37	5	37.35		5
Mean	40.27		37.79		39.03		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	*		0.21		0.87		2.10
Genotype (B)	N.S.		1.29		3.39		8.10
B within A	N.S.		1.07		2.88		5.21
A within B			1.53		4.13		
<b>Earheads/sqm</b>							
MACS4100(d)	311	4	216	5	264		4
HI8826(d)	318	3	253	2	286		3
GW322 (C)	293	5	228	4	261		5
MACS3949(d)(C)	347	1	240	3	293		2
DDW48(d)(C)	331	2	311	1	321		1
Mean	320		250		285		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		11.64		48.08		15.83
Genotype (B)	*		8.85		23.28		7.61
B within A	N.S.		14.65		52.41		6.04
A within B			11.30		40.43		
<b>Grains/Earhead</b>							
MACS4100(d)	32.13	3	44.11	2	38.12		2
HI8826(d)	35.83	2	39.11	4	37.47		3
GW322 (C)	39.62	1	46.44	1	43.03		1
MACS3949(d)(C)	28.50	5	41.99	3	35.24		4
DDW48(d)(C)	29.93	4	32.49	5	31.21		5
Mean	33.20		40.83		37.01		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		2.08		8.59		21.76
Genotype (B)	*		1.59		4.18		10.52
B within A	N.S.		2.57		9.28		7.86
A within B			1.98		7.17		
<b>1000 Grains Weight, g</b>							
MACS4100(d)	40.97	1	40.39	1	40.68		1
HI8826(d)	39.28	2	37.63	3	38.46		3
GW322 (C)	35.52	5	35.61	5	35.57		5
MACS3949(d)(C)	38.72	4	39.81	2	39.27		2
DDW48(d)(C)	38.93	3	36.27	4	37.60		4
Mean	38.69		37.94		38.31		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		1.05		4.34		10.62
Genotype (B)	N.S.		1.07		2.82		6.85
B within A	N.S.		1.31		4.72		4.00
A within B			1.24		4.45		
Date of Sowing:	11.11.2021		02.12.2021				
Date of Harvesting:	23.03.2022		21.04.2022				

Table 5.2.3. Peninsular Zone		IR-TS-DOS-TAD		Niphad		2021-22	
Genotype	Sowing time				Mean	Rk	
	Timely	Rk	Late	Rk			
<b>Yield, q/ha</b>							
MACS4100(d)	59.12	4	50.89	2	55.01	4	
HI8826(d)	69.52	1	59.19	1	64.36	1	
GW322 (C)	58.89	5	47.26	5	53.08	5	
MACS3949(d)(C)	63.70	3	50.67	3	57.18	2	
DDW48(d)(C)	64.84	2	48.05	4	56.44	3	
Mean	63.21		51.21		57.21		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	*		0.91		3.76		6.16
Genotype (B)	N.S.		2.01		5.28		8.59
B within A	N.S.		2.15		6.22		6.58
A within B			2.53		7.33		
<b>Earheads/sqm</b>							
MACS4100(d)	367	4	337	2	352	4	
HI8826(d)	432	1	390	1	411	1	
GW322 (C)	365	5	316	5	341	5	
MACS3949(d)(C)	395	3	337	3	366	2	
DDW48(d)(C)	402	2	321	4	362	3	
Mean	392		340		366		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	*		6.32		26.10		6.68
Genotype (B)	*		8.78		23.08		5.87
B within A	N.S.		9.88		32.04		4.01
A within B			10.63		34.49		
<b>Grains/Earhead</b>							
MACS4100(d)	32.04	1	32.03	1	32.03	1	
HI8826(d)	26.00	5	28.12	5	27.06	5	
GW322 (C)	29.79	3	30.91	4	30.35	3	
MACS3949(d)(C)	30.02	2	32.02	2	31.02	2	
DDW48(d)(C)	27.45	4	31.07	3	29.26	4	
Mean	29.06		30.83		29.94		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	*		0.25		1.02		3.20
Genotype (B)	N.S.		0.79		2.08		6.48
B within A	N.S.		0.97		2.65		6.08
A within B			1.09		2.96		
<b>1000 Grains Weight, g</b>							
MACS4100(d)	50.33	5	47.00	4	48.67	5	
HI8826(d)	62.00	1	54.00	1	58.00	1	
GW322 (C)	54.00	3	48.33	2	51.17	3	
MACS3949(d)(C)	53.67	4	47.00	4	50.33	4	
DDW48(d)(C)	58.67	2	48.33	2	53.50	2	
Mean	55.73		48.93		52.33		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	**		0.22		0.89		1.60
Genotype (B)	*		1.02		2.68		4.77
B within A	N.S.		0.99		2.67		3.57
A within B			1.27		3.44		
Date of Sowing:	10.11.2021		01.12.2021				
Date of Harvesting:	09.03.2022		30.03.2022				

Table 5.2.4. Peninsular Zone		IR-TS-DOS-TAD		Pune		2021-22	
Genotype	Sowing time				Mean	Rk	
	Timely	Rk	Late	Rk			
<b>Yield, q/ha</b>							
MACS4100(d)	34.27	5	37.92	4	36.10	4	
HI8826(d)	37.78	2	42.34	2	40.06	2	
GW322 (C)	37.72	3	44.34	1	41.03	1	
MACS3949(d)(C)	39.55	1	39.95	3	39.75	3	
DDW48(d)(C)	36.31	4	30.96	5	33.64	5	
Mean	37.13		39.10		38.11		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		0.78		3.22		7.93
Genotype (B)	N.S.		1.49		3.91		9.55
B within A	N.S.		1.53		4.62		6.68
A within B			1.81		5.48		
<b>Earheads/sqm</b>							
MACS4100(d)	290	3	273	3	282	3	
HI8826(d)	282	5	248	5	265	5	
GW322 (C)	335	1	317	1	326	1	
MACS3949(d)(C)	283	4	262	4	273	4	
DDW48(d)(C)	302	2	282	2	292	2	
Mean	298		276		287		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		9.82		40.57		13.24
Genotype (B)	N.S.		11.15		29.33		9.51
B within A	N.S.		16.16		51.46		8.65
A within B			15.07		48.00		
<b>Grains/Earhead</b>							
MACS4100(d)	32.73	2	31.17	3	31.95	2	
HI8826(d)	29.99	3	33.42	2	31.71	3	
GW322 (C)	34.11	1	37.14	1	35.62	1	
MACS3949(d)(C)	29.86	4	27.88	4	28.87	4	
DDW48(d)(C)	29.41	5	21.40	5	25.40	5	
Mean	31.22		30.20		30.71		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	N.S.		0.71		2.94		8.98
Genotype (B)	N.S.		1.85		4.87		14.77
B within A	N.S.		2.35		6.51		14.13
A within B			2.56		7.09		
<b>1000 Grains Weight, g</b>							
MACS4100(d)	36.33	4	45.00	4	40.67	4	
HI8826(d)	44.67	2	52.33	2	48.50	2	
GW322 (C)	33.33	5	38.33	5	35.83	5	
MACS3949(d)(C)	47.00	1	55.00	1	51.00	1	
DDW48(d)(C)	41.00	3	51.33	3	46.17	3	
Mean	40.47		48.40		44.43		
	F. Test		SEm		CD (0.05)		CV (%)
Sowing time (A)	**		0.54		2.25		4.74
Genotype (B)	**		0.86		2.26		4.74
B within A	N.S.		1.18		3.49		4.58
A within B			1.20		3.52		
Date of Sowing:	05.11.2021		26.11.2021				
Date of Harvesting:	03.03.2022		25.03.2022				

Table 5.4.1. Peninsular Zone		IR-LS-DOS-TAS		Akola		2021-22	
Genotype	Sowing time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD3090 (C)	58.52	3	32.71	5	45.62	5	
DBW320	60.25	2	42.22	3	51.24	1	
HI1633 (C)	53.85	5	45.10	2	49.47	4	
HD2932 (C)	60.56	1	40.83	4	50.69	3	
RAJ4083 (C)	56.47	4	45.48	1	50.97	2	
Mean	57.93		41.27		49.60		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	**		0.95		3.91	7.40	
Genotype (B)	N.S.		1.74		4.57	8.57	
B within A	*		1.95		5.81	6.63	
A within B			2.20		6.55		
<b>Earheads/sqm</b>							
HD3090 (C)	452	3	427	3	439	3	
DBW320	430	5	378	5	404	5	
HI1633 (C)	435	4	438	2	437	4	
HD2932 (C)	477	2	408	4	443	2	
RAJ4083 (C)	513	1	473	1	493	1	
Mean	461		425		443		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		14.28		58.99	12.48	
Genotype (B)	N.S.		20.25		53.27	11.19	
B within A	N.S.		28.39		85.45	10.72	
A within B			28.04		84.40		
<b>Grains/Earhead</b>							
HD3090 (C)	33.44	1	24.20	5	28.82	2	
DBW320	28.67	4	28.52	2	28.60	3	
HI1633 (C)	31.47	2	29.50	1	30.48	1	
HD2932 (C)	29.21	3	26.47	3	27.84	4	
RAJ4083 (C)	26.28	5	24.73	4	25.50	5	
Mean	29.81		26.68		28.25		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		1.24		5.13	17.02	
Genotype (B)	N.S.		1.93		5.09	16.77	
B within A	N.S.		2.29		7.04	13.23	
A within B			2.46		7.56		
<b>1000 Grains Weight, g</b>							
HD3090 (C)	39.07	5	32.70	5	35.88	5	
DBW320	49.00	1	39.67	1	44.33	1	
HI1633 (C)	39.43	4	35.83	4	37.63	4	
HD2932 (C)	43.57	2	37.90	3	40.73	2	
RAJ4083 (C)	41.97	3	39.17	2	40.57	3	
Mean	42.61		37.05		39.83		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	**		0.01		0.04	0.09	
Genotype (B)	**		0.13		0.33	0.78	
B within A	**		0.18		0.47	0.87	
A within B			0.19		0.50		
Date of Sowing:	26.11.2021		21.12.2021				
Date of Harvesting:	29.03.2022		02.04.2022				



Genotype	Sowing time				Mean	Rk
	Late	Rk	Very Late	Rk		
<b>Yield, q/ha</b>						
HD3090 (C)	34.97	2	25.96	3	30.47	2
DBW320	32.51	3	25.82	4	29.17	4
HI1633 (C)	37.73	1	30.47	1	34.10	1
HD2932 (C)	30.78	4	27.89	2	29.22	3
RAJ4083 (C)	29.51	5	24.66	5	27.09	5
Mean	33.10		26.91		30.01	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	*		0.84		3.48	10.88
Genotype (B)			0.87		2.29	7.09
B within A	N.S.		1.59		4.84	8.66
A within B			1.37		4.19	
<b>Earheads/sqm</b>						
HD3090 (C)	289	5	204	4	247	5
DBW320	295	4	199	5	247	4
HI1633 (C)	304	2	205	3	255	3
HD2932 (C)	307	1	217	2	262	2
RAJ4083 (C)	297	3	237	1	267	1
Mean	298		213		256	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	*		12.97		53.55	19.66
Genotype (B)	N.S.		7.73		20.33	7.41
B within A	N.S.		17.22		59.94	8.59
A within B			11.83		41.18	
<b>Grains/Earhead</b>						
HD3090 (C)	33.68	1	40.50	1	37.09	1
DBW320	25.73	5	35.81	4	30.77	4
HI1633 (C)	30.92	2	38.76	2	34.84	2
HD2932 (C)	26.77	4	36.48	3	31.62	3
RAJ4083 (C)	27.10	3	29.45	5	28.27	5
Mean	28.84		36.20		32.52	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	*		0.85		3.50	10.09
Genotype (B)	*		1.35		3.56	10.19
B within A	N.S.		1.92		5.60	10.23
A within B			1.92		5.61	
<b>1000 Grains Weight, g</b>						
HD3090 (C)	36.16	5	31.57	5	33.87	5
DBW320	43.33	1	36.19	2	39.76	1
HI1633 (C)	40.17	2	38.30	1	39.24	2
HD2932 (C)	38.02	3	35.03	4	36.53	4
RAJ4083 (C)	37.82	4	35.56	3	36.69	3
Mean	39.10		35.33		37.22	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	**		0.17		0.70	1.77
Genotype (B)	*		0.66		1.74	4.36
B within A	N.S.		1.14		3.03	5.85
A within B			1.11		2.95	
Date of Sowing:	02.12.2021		23.12.2021			
Date of Harvesting:	13.04.2022		26.04.2022			

Genotype	IR-LS-DOS-TAS				Niphad	2021-22
	Sowing time					
	Late	Rk	Very Late	Rk	Mean	Rk
<b>Yield, q/ha</b>						
HD3090 (C)	52.13	4	44.07	5	48.10	5
DBW320	54.47	3	50.25	3	52.36	3
HI1633 (C)	63.46	2	51.37	2	57.42	2
HD2932 (C)	65.71	1	52.10	1	58.90	1
RAJ4083 (C)	51.66	5	46.37	4	49.01	4
Mean	57.49		48.83		53.16	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	*		0.82		3.38	5.97
Genotype (B)	*		1.74		4.59	8.04
B within A	N.S.		2.36		6.63	8.05
A within B			2.47		6.94	
<b>Earheads/sqm</b>						
HD3090 (C)	337	4	285	5	311	5
DBW320	352	3	325	3	339	3
HI1633 (C)	410	2	332	2	371	2
HD2932 (C)	425	1	337	1	381	1
RAJ4083 (C)	334	5	300	4	317	4
Mean	372		316		344	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	**		2.42		9.99	2.72
Genotype (B)	*		12.31		32.39	8.77
B within A	N.S.		16.60		44.20	9.25
A within B			17.90		47.64	
<b>Grains/Earhead</b>						
HD3090 (C)	32.65	2	36.94	1	34.80	2
DBW320	31.97	3	32.26	4	32.11	3
HI1633 (C)	31.20	4	32.95	3	32.07	4
HD2932 (C)	29.61	5	31.91	5	30.76	5
RAJ4083 (C)	34.36	1	35.28	2	34.82	1
Mean	31.96		33.87		32.91	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	N.S.		1.27		5.24	14.95
Genotype (B)	N.S.		2.18		5.72	16.19
B within A	N.S.		3.22		9.22	17.40
A within B			3.19		9.15	
<b>1000 Grains Weight, g</b>						
HD3090 (C)	48.00	4	42.67	5	45.33	4
DBW320	48.67	3	48.00	2	48.33	3
HI1633 (C)	49.67	2	47.67	3	48.67	2
HD2932 (C)	52.67	1	48.67	1	50.67	1
RAJ4083 (C)	45.33	5	44.33	4	44.83	5
Mean	48.87		46.27		47.57	
	F. Test		SEm		CD (0.05)	CV (%)
Sowing time (A)	*		0.42		1.75	3.45
Genotype (B)	**		0.39		1.02	1.99
B within A	N.S.		1.06		3.04	3.95
A within B			0.86		2.47	
Date of Sowing:	01.12.2021		17.12.2021			
Date of Harvesting:	25.03.2022		08.04.2022			

Table 5.4.4. Peninsular Zone		IR-LS-DOS-TAS		Pune		2021-22	
Genotype	Sowing time				Mean	Rk	
	Late	Rk	Very Late	Rk			
<b>Yield, q/ha</b>							
HD3090 (C)	48.41	4	33.31	5	40.86	5	
DBW320	53.30	2	33.32	4	43.31	2	
HI1633 (C)	49.39	3	34.45	2	41.92	3	
HD2932 (C)	57.16	1	39.58	1	48.37	1	
RAJ4083 (C)	47.67	5	34.06	3	40.86	4	
Mean	51.19		34.94		43.07		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	*		1.43		8.70	12.86	
Genotype (B)	**		1.29		3.87	7.34	
B within A	N.S.		1.82		5.47		
A within B			2.17		6.51		
<b>Earheads/sqm</b>							
HD3090 (C)	353	3	307	3	330	4	
DBW320	345	4	287	5	316	5	
HI1633 (C)	338	5	337	1	338	3	
HD2932 (C)	408	1	315	2	362	1	
RAJ4083 (C)	388	2	298	4	343	2	
Mean	367		309		338		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	*		8.52		51.87	9.78	
Genotype (B)	N.S.		18.92		56.73	13.73	
B within A	N.S.		26.76		80.22		
A within B			25.41		76.17		
<b>Grains/Earhead</b>							
HD3090 (C)	32.80	4	34.67	1	33.73	1	
DBW320	33.41	3	26.77	3	30.09	4	
HI1633 (C)	38.20	1	23.63	5	30.91	2	
HD2932 (C)	33.62	2	28.04	2	30.83	3	
RAJ4083 (C)	29.56	5	24.46	4	27.01	5	
Mean	33.51		27.51		30.51		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		1.09		6.66	13.88	
Genotype (B)	N.S.		1.80		5.38	14.41	
B within A	N.S.		2.54		7.61		
A within B			2.52		7.56		
<b>1000 Grains Weight, g</b>							
HD3090 (C)	42.00	2	33.00	5	37.50	5	
DBW320	46.33	1	44.33	3	45.33	1	
HI1633 (C)	38.67	5	43.33	4	41.00	4	
HD2932 (C)	41.67	4	44.67	2	43.17	3	
RAJ4083 (C)	42.00	2	47.00	1	44.50	2	
Mean	42.13		42.47		42.30		
	F. Test		SEm		CD (0.05)	CV (%)	
Sowing time (A)	N.S.		0.50		3.04	4.57	
Genotype (B)	**		0.42		1.26	2.43	
B within A	**		0.59		1.78		
A within B			0.73		2.18		
Date of Sowing:	26.11.2021		17.12.2021				
Date of Harvesting:	25.03.2022		25.03.2022				

<b>Table 6.1.1. Northern Hill Zone</b>		<b>SPL-1</b>	<b>Bajaura</b>	<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	349	43.73	30.89	46.94	112.10
PE Pendimethalin @ 1500 g/ha	366	45.98	31.29	52.55	119.34
PE Pyroxasulfone @ 127.5 g/ha	384	42.53	26.08	42.39	105.53
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	359	47.62	30.67	52.46	117.89
PE Pyroxa+metsulfuron 127.5+4 g/ha	364	44.23	29.36	47.17	111.59
EPOST Pyroxasulfone@ 127.5 g/ha	353	44.04	29.60	45.99	107.72
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	354	42.08	30.07	44.77	104.96
PE Metribuzin @300 g/ha	347	46.60	30.22	48.80	111.45
PE Pendi + metribuzin@1250+280 g/ha	358	47.23	30.36	51.23	115.01
PE Pyroxa + metribuzin@127.5+280 g/ha	363	46.46	30.05	50.58	113.17
Weedy Check	353	42.23	26.42	39.28	103.46
Weed free	359	46.51	30.86	51.50	114.70
SEM	7.69	0.60	1.22	1.40	3.68
CD (0.05)	18.66	1.45	2.97	3.39	8.93
CV (%)	3.71	2.31	7.15	5.06	5.72
Date of Sowing:	26.10.2021	Date of Harvesting:	21.05.2022		

<b>Table 6.1.2. Northern Hill Zone</b>		<b>SPL-1</b>	<b>Malan</b>	<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 Grains Weight, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	440	40.06	22.71	40.00	95.00
PE Pendimethalin @ 1500 g/ha	432	40.98	14.13	25.00	81.25
PE Pyroxasulfone @ 127.5 g/ha	488	42.19	18.82	38.75	89.58
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	486	42.62	19.01	39.38	88.33
PE Pyroxa+metsulfuron 127.5+4 g/ha	482	41.23	18.22	36.25	78.33
EPOST Pyroxasulfone@ 127.5 g/ha	462	41.04	15.83	30.00	68.75
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	415	39.08	13.31	21.56	54.58
PE Metribuzin @300 g/ha	494	40.94	17.58	35.63	85.00
PE Pendi + metribuzin@1250+280 g/ha	472	41.23	20.41	39.38	89.58
PE Pyroxa + metribuzin@127.5+280 g/ha	456	41.11	20.35	38.04	88.33
Weedy Check	453	39.82	13.51	24.38	79.58
Weed free	492	41.18	19.55	39.63	88.23
SEM	8.60	0.41	1.07	1.99	1.69
CD(0.05)	20.87	0.99	2.59	4.83	4.11
CV(%)	3.21	1.73	10.39	10.12	3.57
Date of Sowing:	11.11.2021	Date of Harvesting:	30.04.2022		

<b>Table 6.3.1. North Western Plains Zone</b>		<b>SPL-1</b>	<b>Gurdaspur</b>		<b>2021-22</b>	
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
PE Pendimethalin @ 1000 g/ha	49.80	330	37.65	40.13	120.38	96.43
PE Pendimethalin @ 1500 g/ha	50.70	332	39.68	38.52	122.77	97.33
PE Pyroxasulfone @ 127.5 g/ha	50.20	331	39.66	38.33	121.05	96.43
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	51.70	341	38.86	39.06	126.80	98.77
PE Pyroxa+metsulfuron 127.5+4 g/ha	51.00	335	38.12	39.98	123.88	98.13
EPOST Pyroxasulfone@ 127.5 g/ha	49.20	327	38.51	39.13	118.56	96.17
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	49.50	329	37.20	40.47	119.61	96.30
PE Metribuzin @300 g/ha	48.90	325	38.49	39.21	117.89	95.67
PE Pendi + metribuzin@1250+280 g/ha	51.25	341	38.70	39.02	125.52	98.40
PE Pyroxa + metribuzin@127.5+280 g/ha	51.80	343	39.14	38.69	127.24	98.87
Weedy Check	39.00	275	36.00	39.43	101.27	93.87
Weed free	51.90	345	39.41	38.18	129.81	99.33
Mean	49.58	329	38.45	39.18	121.23	97.14
SEm	1.12	7.38	0.50	1.22	4.32	1.06
CD (0.05)	2.73	17.92	1.20	2.95	10.48	2.56
CV (%)	3.93	3.88	2.23	5.37	6.17	1.88
Date of Sowing:	17.11.2021					

Table 6.3.2. North Western Plains Zone		SPL-1		Hisar		2021-22	
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm	
PE Pendimethalin @ 1000 g/ha	44.36	388	34.83	32.80	125.64	100.33	
PE Pendimethalin @ 1500 g/ha	45.68	402	35.33	32.28	126.37	102.78	
PE Pyroxasulfone @ 127.5 g/ha	47.99	405	36.20	32.74	130.04	104.78	
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	51.65	420	36.49	33.81	139.19	109.11	
PE Pyroxa+metsulfuron 127.5+4 g/ha	50.70	417	36.34	33.56	137.36	108.00	
EPOST Pyroxasulfone@ 127.5 g/ha	47.47	405	36.29	32.29	130.04	106.22	
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	48.57	408	36.08	33.02	134.07	105.22	
PE Metribuzin @300 g/ha	44.18	380	36.37	32.03	122.34	100.11	
PE Pendi + metribuzin@1250+280 g/ha	46.70	420	35.41	31.38	127.84	104.33	
PE Pyroxa + metribuzin@127.5+280 g/ha	46.45	413	35.22	31.89	126.37	105.33	
Weedy Check	32.93	312	32.86	32.36	111.72	91.33	
Weed free	52.16	422	36.63	33.83	138.10	108.89	
Mean	46.57	399	35.67	32.67	129.09	103.87	
SEm	2.25	13.04	0.75	1.64	6.80	3.24	
CD (0.05)	5.47	31.67	1.82	3.97	16.52	7.87	
CV (%)	8.38	5.66	3.64	8.67	9.13	5.41	
Date of Sowing:	11.11.2021						

Table 6.3.3. North Western Plains Zone		SPL-1		Jammu		2021-22	
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Plant Ht., cm		
PE Pendimethalin @ 1000 g/ha	38.88	370	36.44	28.97	87.97		
PE Pendimethalin @ 1500 g/ha	39.38	389	36.75	27.61	86.47		
PE Pyroxasulfone @ 127.5 g/ha	36.92	381	37.00	26.82	85.64		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	41.42	363	36.61	31.18	85.84		
PE Pyroxa+metsulfuron 127.5+4 g/ha	37.78	406	36.86	25.42	84.77		
EPOST Pyroxasulfone@ 127.5 g/ha	36.65	368	36.70	27.22	85.17		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	37.52	351	36.99	29.14	89.74		
PE Metribuzin @300 g/ha	37.81	381	37.81	26.55	85.74		
PE Pendi + metribuzin@1250+280 g/ha	41.15	410	37.53	27.05	87.14		
PE Pyroxa + metribuzin@127.5+280 g/ha	42.87	398	36.45	29.91	90.61		
Weedy Check	31.48	286	34.91	31.90	79.41		
Weed free	51.72	471	38.07	29.17	92.46		
Mean	39.47	381	36.84	28.41	86.75		
SEm	2.78	22.22	1.02	2.73	4.03		
CD (0.05)	6.75	53.95	2.48	6.62	9.79		
CV (%)	12.20	10.09	4.80	16.63	8.05		
Date of Sowing:	16.11.2021						

Table 6.4.1. North Western Plains Zone		SPL-1		Gurdaspur		Weeds		2021-22	
Herbicide	Weed Count 30	Weed Count 60	Weed Count 90	Weed dry wt. 30	Weed dry wt. 60	Weed dry wt. 90			
	DAS	DAS	DAS	DAS	DAS	DAS			
PE Pendimethalin @ 1000 g/ha	2.71 (6.5)	4.20 (17.0)	5.19 (26.0)	1.55 (1.43)	1.82 (2.30)	2.67 (6.32)			
PE Pendimethalin @ 1500 g/ha	2.55 (5.7)	3.98 (15.2)	5.14 (25.5)	1.51 (1.28)	1.66 (1.77)	2.45 (5.20)			
PE Pyroxasulfone @ 127.5 g/ha	2.62 (6.0)	4.12 (16.2)	5.17 (26.0)	1.52 (1.32)	1.76 (2.10)	2.51 (5.70)			
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	1.93 (3.0)	3.65 (12.5)	4.89 (23.2)	1.29 (0.75)	1.55 (1.45)	2.20 (3.90)			
PE Pyroxa+metsulfuron 127.5+4 g/ha	2.48 (5.3)	3.99 (15.0)	5.08 (25.0)	1.44 (1.08)	1.64 (1.72)	2.41 (4.80)			
EPOST Pyroxasulfone@ 127.5 g/ha	2.88 (7.5)	4.40 (18.5)	5.41 (28.5)	1.60 (1.64)	1.88 (2.54)	2.78 (6.88)			
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	2.86 (7.3)	4.34 (18.0)	5.36 (28.0)	1.60 (1.58)	1.84 (2.42)	2.76 (7.06)			
PE Metribuzin @300 g/ha	2.96 (7.8)	4.48 (19.2)	5.47 (29.0)	1.65 (1.72)	1.89 (2.61)	2.90 (7.65)			
PE Pendi + metribuzin@1250+280 g/ha	2.24 (4.2)	3.86 (14.0)	4.92 (23.5)	1.33 (0.84)	1.57 (1.52)	2.32 (4.40)			
PE Pyroxa + metribuzin@127.5+280 g/ha	1.81 (2.3)	3.60 (12.2)	4.78 (22.0)	1.27 (0.62)	1.52 (1.33)	2.04 (3.20)			
Weedy Check	6.64 (43.3)	9.76 (94.7)	11.06 (121.5)	3.75 (13.03)	5.50 (29.31)	6.55 (42.05)			
Weed free	1.00 (1.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)			
Mean	2.72 (8.3)	4.28 (21.0)	5.29 (31.5)	1.62 (2.11)	1.97 (4.09)	2.72			
SEm	0.27	0.30	0.27	0.12	0.11	0.28			
CD (0.05)	0.66	0.72	0.66	0.30	0.28	0.67			
CV (%)	17.37	12.01	8.87	13.15	10.03	17.57			

Table 6.4.2. North Western Plains Zone

Herbicide	SPL-1		Hisar	Weeds		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	NA	4.28 (17.3)	4.10 (16.0)	NA	4.25 (17.11)	5.82 (33.01)
PE Pendimethalin @ 1500 g/ha	NA	4.04 (16.0)	4.10 (16.0)	NA	3.74 (13.75)	5.62 (31.04)
PE Pyroxasulfone @ 127.5 g/ha	NA	3.21 (9.3)	2.95 (8.0)	NA	3.24 (9.52)	3.90 (15.16)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	NA	2.75 (6.7)	2.49 (5.3)	NA	2.56 (5.68)	3.67 (12.96)
PE Pyroxa+metsulfuron 127.5+4 g/ha	NA	3.20 (9.3)	2.95 (8.0)	NA	3.27 (9.75)	3.94 (15.28)
EPOST Pyroxasulfone@ 127.5 g/ha	NA	3.37 (10.7)	3.40 (10.7)	NA	3.32 (10.08)	4.64 (20.73)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	NA	3.20 (9.3)	3.37 (10.7)	NA	2.56 (5.68)	4.80 (22.63)
PE Metribuzin @300 g/ha	NA	2.49 (5.3)	2.75 (6.7)	NA	2.18 (3.81)	5.34 (28.28)
PE Pendi + metribuzin@1250+280 g/ha	NA	4.04 (16.0)	3.95 (14.7)	NA	3.81 (14.07)	5.62 (30.69)
PE Pyroxa + metribuzin@127.5+280 g/ha	NA	3.58 (12.0)	3.58 (12.0)	NA	3.68 (12.63)	4.35 (18.12)
Weedy Check	NA	8.60 (73.3)	8.17 (66.7)	NA	6.99 (48.00)	10.87 (117.41)
Weed free	NA	1.00 (0.0)	1.00 (0.0)	NA	1.00 (0.00)	1.00 (0.00)
Mean		3.65 (15.4)	3.57 (14.6)		3.38 (12.51)	4.96
SEm		0.34	0.35		0.30	0.43
CD (0.05)		0.82	0.86		0.73	1.04
CV (%)		16.12	17.20		15.49	14.92

Table 6.4.3. North Western Plains Zone

Herbicide	SPL-1		Jammu	Weeds		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	5.19 (26.0)1	5.91 (34.0)	6.36 (39.7)	4.07 (15.85)	8.00 (63.17)	8.91 (78.46)
PE Pendimethalin @ 1500 g/ha	3.95 (14.7)	4.39 (18.3)	5.12 (25.3)	2.96 (7.81)	6.23 (37.99)	6.97 (47.76)
PE Pyroxasulfone @ 127.5 g/ha	5.55 (30.0)	5.85 (33.3)	6.22 (37.7)	4.64 (20.59)	8.00 (63.65)	8.89 (78.45)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.90 (14.3)	4.96 (23.7)	5.45 (28.7)	3.19 (9.18)	7.23 (51.75)	7.97 (62.88)
PE Pyroxa+metsulfuron 127.5+4 g/ha	5.22 (26.3)	6.14 (36.7)	6.53 (41.7)	4.06 (15.57)	8.22 (66.90)	9.17 (83.17)
EPOST Pyroxasulfone@ 127.5 g/ha	5.67 (31.3)	6.31 (39.0)	6.65 (43.3)	4.40 (18.36)	8.54 (72.24)	9.48 (89.28)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	5.38 (28.0)	5.59 (30.3)	6.07 (36.0)	4.27 (17.57)	8.21 (66.70)	9.03 (80.90)
PE Metribuzin @300 g/ha	5.10 (25.0)	4.67 (21.0)	5.44 (28.7)	4.04 (15.55)	5.03 (24.36)	6.03 (35.35)
PE Pendi + metribuzin@1250+280 g/ha	3.26 (9.7)	3.64 (12.3)	4.55 (19.7)	2.66 (6.11)	4.63 (20.59)	5.40 (28.27)
PE Pyroxa + metribuzin@127.5+280 g/ha	2.88 (7.3)	3.40 (10.7)	4.20 (16.7)	2.61 (5.81)	4.40 (18.39)	5.09 (24.90)
Weedy Check	10.48 (109.0)	11.47 (130.7)	12.26 (149.7)	8.24 (67.35)	16.35 (266.72)	18.04 (325.07)
Weed free	1.00 (1.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
Mean	4.80	5.28 (32.5)	5.82 (38.9)	3.84 (16.65)	7.16 (62.71)	8.00
SEm	0.20	0.22	0.22	0.26	0.31	0.30
CD (0.05)	0.50	0.53	0.54	0.64	0.75	0.73
CV (%)	7.39	7.23	6.59	11.87	7.47	6.51

Table 6.5.1. North Eastern Plains Zone

Herbicide	Yield, q/ha	SPL-1	1000 GW, g	Ayodhya	2021-22
		Earheads/sqm		Grains/Earhead	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	42.72	428	39.83	25.09	99.62
PE Pendimethalin @ 1500 g/ha	43.44	418	39.93	26.03	102.25
PE Pyroxasulfone @ 127.5 g/ha	43.30	414	39.67	26.40	103.49
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	44.05	481	39.57	23.14	104.12
PE Pyroxa+metsulfuron 127.5+4 g/ha	43.78	479	39.53	23.14	103.79
EPOST Pyroxasulfone@ 127.5 g/ha	42.56	417	39.77	25.69	102.21
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	44.13	453	39.77	24.52	103.71
PE Metribuzin @300 g/ha	42.42	414	39.90	25.66	99.86
PE Pendi + metribuzin@1250+280 g/ha	44.28	490	39.83	22.71	104.07
PE Pyroxa + metribuzin@127.5+280 g/ha	44.14	482	39.93	22.92	103.73
Weedy Check	32.49	380	37.07	23.10	76.84
Weed free	44.96	483	40.13	23.18	107.06
Mean	42.69	445	39.58	24.30	100.90
SEm	0.25	5	0.13	0.37	0.90
CD (0.05)	0.60	11	0.32	0.89	2.20
CV (%)	1.00	2	0.58	2.62	1.55
Date of Sowing :	11.11.2021		Date of Harvesting:		13.03.2022

Table 6.5.2. North Eastern Plains Zone		SPL-1		Ranchi	2021-22
Herbicide	Yield, q/ha	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	52.63	373	41.67	33.91	117.67
PE Pendimethalin @ 1500 g/ha	53.60	375	42.00	34.31	119.57
PE Pyroxasulfone @ 127.5 g/ha	56.13	380	40.67	36.40	125.25
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	58.07	398	41.67	35.07	129.52
PE Pyroxa+metsulfuron 127.5+4 g/ha	63.30	410	42.00	36.82	141.45
EPOST Pyroxasulfone@ 127.5 g/ha	55.83	383	42.00	35.15	124.84
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	61.97	393	43.33	36.47	138.28
PE Metribuzin @300 g/ha	61.07	400	44.67	34.28	136.21
PE Pendi + metribuzin@1250+280 g/ha	64.37	414	45.00	34.72	143.78
PE Pyroxa + metribuzin@127.5+280 g/ha	64.90	418	42.33	36.68	144.81
Weedy Check	44.87	313	42.93	34.11	100.06
Weed free	65.30	419	45.00	34.63	145.68
Mean	58.50	390	42.77	35.21	130.59
SEm	2.20	16	1.11	2.40	4.94
CD (0.05)	5.35	38	2.69	5.83	12.00
CV (%)	6.52	7	4.49	11.81	6.55
Date of Sowing :	19.11.2021		Date of Harvesting:		14.04.2022

Table 6.5.3. North Eastern Plains Zone		SPL-1		RPCAU PUSA	2021-22
Herbicide	Yield, q/ha	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	34.84	229	35.03	43.36	100.97
PE Pendimethalin @ 1500 g/ha	35.94	238	36.19	41.74	99.10
PE Pyroxasulfone @ 127.5 g/ha	37.11	216	36.17	47.57	96.72
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	36.27	216	36.07	46.50	99.25
PE Pyroxa+metsulfuron 127.5+4 g/ha	36.27	222	36.00	45.49	97.70
EPOST Pyroxasulfone@ 127.5 g/ha	37.34	237	37.68	41.77	102.61
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	38.48	223	38.95	44.34	104.44
PE Metribuzin @300 g/ha	35.10	233	35.00	43.18	97.26
PE Pendi + metribuzin@1250+280 g/ha	36.77	212	36.07	48.04	97.30
PE Pyroxa + metribuzin@127.5+280 g/ha	36.77	236	38.06	41.08	99.38
Weedy Check	24.57	209	32.00	36.83	92.62
Weed free	38.61	237	39.23	41.53	101.53
Mean	35.67	226	36.37	43.45	99.07
SEm	0.92	3	0.93	1.50	3.02
CD (0.05)	2.24	7	2.27	3.65	7.34
CV (%)	4.48	2	4.44	5.99	5.28
Date of Sowing :	14.12.2021		Date of Harvesting:		16.04.2022

Table 6.5.4. North Eastern Plains Zone		SPL-1		Shillongani	2021-22
Herbicide	Yield, q/ha	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	42.38	140	44.60	67.94	57.01
PE Pendimethalin @ 1500 g/ha	44.45	183	45.33	57.00	57.59
PE Pyroxasulfone @ 127.5 g/ha	43.78	127	46.93	73.53	45.07
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	44.55	224	49.50	41.26	60.01
PE Pyroxa+metsulfuron 127.5+4 g/ha	45.99	174	49.83	53.21	57.89
EPOST Pyroxasulfone@ 127.5 g/ha	44.79	150	52.57	57.64	49.58
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	45.73	174	45.90	57.81	76.60
PE Metribuzin @300 g/ha	43.01	127	45.03	75.57	53.14
PE Pendi + metribuzin@1250+280 g/ha	46.84	228	44.00	46.87	76.80
PE Pyroxa + metribuzin@127.5+280 g/ha	46.39	216	44.47	48.67	77.71
Weedy Check	23.57	246	44.73	21.39	39.47
Weed free	47.74	247	44.80	43.53	86.37
Mean	43.27	186	46.48	53.70	61.44
SEm	1.15	10	2.66	3.98	3.10
CD (0.05)	2.78	25	6.46	9.67	7.52
CV (%)	4.59	9	9.92	12.84	8.73
Date of Sowing :	17.11.2021		Date of Harvesting:		10.04.2022

Table 6.6.1. North Eastern Plains Zone

Herbicide	SPL-1			Ayodhya	2021-22	
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	3.79(13.33)	4.12(16.00)	3.80(13.43)	4.58(20.01)	5.27(26.74)	4.59(20.08)
PE Pendimethalin @ 1500 g/ha	3.56(11.70)	3.88(14.03)	3.60(11.97)	4.35(17.90)	5.02(24.24)	4.35(17.90)
PE Pyroxasulfone @ 127.5 g/ha	3.78(13.30)	4.13(16.03)	3.78(13.27)	4.57(19.85)	5.26(26.71)	4.56(19.82)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.30(9.90)	3.56(11.70)	3.32(10.00)	3.99(14.96)	4.76(21.63)	3.99(14.96)
PE Pyroxa+metsulfuron 127.5+4 g/ha	3.32(10.03)	3.61(12.00)	3.36(10.27)	4.00(15.02)	4.81(22.12)	4.04(15.33)
EPOST Pyroxasulfone@ 127.5 g/ha	3.57(11.73)	3.90(14.23)	3.66(12.40)	4.31(17.57)	5.06(24.61)	4.42(18.53)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	3.32(10.03)	3.59(11.90)	3.37(10.33)	4.00(15.02)	4.70(21.12)	4.06(15.74)
PE Metribuzin @300 g/ha	3.79(13.37)	4.11(15.90)	3.83(13.70)	4.58(20.01)	5.27(26.73)	4.62(20.39)
PE Pendi + metribuzin@1250+280 g/ha	3.04(8.23)	3.29(9.83)	3.06(8.37)	3.65(12.34)	4.43(18.62)	3.67(12.48)
PE Pyroxa + metribuzin@127.5+280 g/ha	3.11(8.70)	3.37(10.33)	3.14(8.87)	3.76(13.13)	4.43(18.63)	3.76(13.13)
Weedy Check	4.57(19.87)	5.00(23.97)	4.66(20.70)	5.59(30.20)	6.19(37.34)	6.02(35.20)
Weed free	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)
Mean	3.35(10.85)	3.63(12.99)	3.38(11.11)	4.03(16.33)	4.68(22.37)	4.09(16.94)
SEm	0.04(0.32)	0.04(0.27)	0.04(0.26)	0.05(0.39)	0.05(0.51)	0.04(0.35)
CD (0.05)	0.10(0.78)	0.09(0.66)	0.09(0.63)	0.11(0.95)	0.12(1.23)	0.10(0.85)
CV (%)	2.23(5.11)	1.75(3.63)	1.85(4.01)	1.94(4.15)	1.78(3.91)	1.70(3.58)
Date of Sowing :	11.11.2021			Date of Harvesting:		13.03.2022

Table 6.6.2. North Eastern Plains Zone

Herbicide	SPL-1			Ranchi	2021-22	
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	1.41(1.00)	4.78(24.67)	3.87(15.67)	1.06(0.13)	2.97(8.47)	2.61(6.17)
PE Pendimethalin @ 1500 g/ha	1.72(2.00)	5.35(33.00)	4.80(27.33)	1.11(0.24)	2.54(7.49)	2.39(6.16)
PE Pyroxasulfone @ 127.5 g/ha	1.79(2.33)	5.86(38.00)	4.41(21.33)	1.24(0.56)	2.90(8.67)	2.83(8.05)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	1.61(1.67)	4.74(23.00)	3.28(10.33)	1.13(0.29)	2.52(5.97)	2.35(4.97)
PE Pyroxa+metsulfuron 127.5+4 g/ha	1.82(2.33)	4.75(22.33)	4.19(17.67)	1.11(0.24)	2.81(7.40)	2.22(3.93)
EPOST Pyroxasulfone@ 127.5 g/ha	1.99(3.00)	6.83(49.33)	5.24(28.00)	1.32(0.78)	4.04(16.37)	3.39(10.83)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	1.72(2.00)	3.38(11.33)	2.65(6.33)	1.13(0.27)	1.70(2.29)	1.62(1.93)
PE Metribuzin @300 g/ha	1.88(2.67)	3.61(12.67)	3.12(9.33)	1.30(0.79)	2.33(4.79)	2.25(4.43)
PE Pendi + metribuzin@1250+280 g/ha	1.91(2.67)	3.62(14.00)	3.42(12.67)	1.14(0.31)	2.23(4.66)	2.15(4.10)
PE Pyroxa + metribuzin@127.5+280 g/ha	1.82(2.33)	3.40(11.67)	2.52(5.67)	1.14(0.31)	2.42(6.78)	2.20(4.99)
Weedy Check	5.57(30.33)	12.98(170.00)	10.99(120.00)	2.63(6.35)	8.00(63.70)	6.92(47.27)
Weed free	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)
Mean	2.02(4.36)	5.02(34.17)	4.12(22.86)	1.28(0.85)	2.96(11.38)	2.66(8.57)
SEm	0.20(1.51)	1.07(14.09)	0.86(7.83)	0.16(0.79)	0.68(4.74)	0.54(3.42)
CD (0.05)	0.48(3.68)	2.61(34.20)	2.09(19.01)	0.38(1.93)	1.64(11.51)	1.31(8.29)
CV (%)	16.87(60.13)	37.01(71.41)	36.15(59.32)	21.33(161.06)	39.66(72.10)	35.00(69.04)
Date of Sowing :	19.11.2021			Date of Harvesting:		14.04.2022

Table 6.6.3. North Eastern Plains Zone

Herbicide	SPL-1			RPCAU PUSA	2021-22	
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	3.99(15.00)	5.49(29.33)	4.16(16.33)	3.25(9.62)	4.20(16.63)	3.50(11.26)
PE Pendimethalin @ 1500 g/ha	3.98(15.00)	4.85(22.67)	4.27(17.33)	3.16(9.04)	3.47(11.06)	3.54(11.55)
PE Pyroxasulfone @ 127.5 g/ha	4.34(18.00)	5.44(28.67)	4.45(19.00)	3.70(12.71)	3.96(14.74)	3.57(11.76)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	4.32(17.67)	5.26(26.67)	4.11(16.00)	3.34(10.14)	3.83(13.67)	3.26(9.70)
PE Pyroxa+metsulfuron 127.5+4 g/ha	3.91(14.33)	4.76(21.67)	3.96(14.67)	3.13(8.83)	3.46(11.02)	3.45(10.94)
EPOST Pyroxasulfone@ 127.5 g/ha	4.47(19.00)	5.65(31.00)	4.65(20.67)	3.48(11.15)	4.06(15.52)	3.61(12.00)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	3.95(14.67)	5.80(32.67)	4.19(16.67)	3.40(10.58)	3.69(12.70)	3.31(10.02)
PE Metribuzin @300 g/ha	4.45(19.00)	5.49(29.33)	4.49(19.33)	3.63(12.17)	3.87(14.06)	3.50(11.30)
PE Pendi + metribuzin@1250+280 g/ha	4.13(16.33)	4.86(22.67)	4.08(15.67)	3.13(8.84)	3.45(10.93)	3.22(9.37)
PE Pyroxa + metribuzin@127.5+280 g/ha	3.65(12.33)	4.89(23.00)	3.95(14.67)	3.08(8.52)	3.43(10.77)	3.17(9.10)
Weedy Check	7.76(59.33)	12.06(145.00)	11.67(135.33)	5.03(24.34)	7.18(50.64)	7.02(48.22)
Weed free	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)
Mean	4.16(18.39)	5.46(34.39)	4.58(25.47)	3.28(10.50)	3.80(15.15)	3.51(12.93)
SEm	0.22(2.15)	0.23(3.98)	0.19(2.14)	0.11(0.75)	0.15(1.48)	0.12(0.86)
CD (0.05)	0.55(5.23)	0.57(9.67)	0.45(5.19)	0.26(1.83)	0.37(3.59)	0.30(2.10)
CV (%)	9.34(20.28)	7.42(20.07)	7.01(14.53)	5.55(12.42)	6.95(16.90)	6.10(11.58)
Date of Sowing :	14.12.2021			Date of Harvesting:		16.04.2022



Herbicide	SPL-1			Shillongani		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	12.16(147.67)	16.64(279.00)	16.30(265.33)	4.83(22.33)	7.88(61.33)	9.62(92.00)
PE Pendimethalin @ 1500 g/ha	9.74(94.00)	14.35(206.00)	10.28(105.33)	4.28(17.33)	5.58(30.67)	5.55(30.33)
PE Pyroxasulfone @ 127.5 g/ha	15.61(243.00)	21.42(458.67)	19.59(385.67)	5.57(30.30)	10.81(116.00)	12.86(165.00)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	9.69(93.00)	10.99(120.00)	14.64(215.00)	4.20(16.67)	4.79(22.00)	9.12(83.00)
PE Pyroxa+metsulfuron 127.5+4 g/ha	15.95(254.00)	25.51(650.67)	26.94(725.00)	6.75(44.67)	10.45(108.33)	17.63(310.00)
EPOST Pyroxasulfone@ 127.5 g/ha	14.30(203.67)	23.56(554.33)	21.91(479.33)	6.02(35.33)	10.03(99.67)	11.44(130.00)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	23.91(570.67)	28.55(814.00)	26.36(694.00)	6.73(44.33)	14.42(207.00)	15.12(227.67)
PE Metribuzin @300 g/ha	16.59(274.67)	16.39(268.67)	18.46(340.33)	5.23(26.33)	6.56(42.33)	10.99(120.00)
PE Pendi + metribuzin@1250+280 g/ha	8.30(68.00)	8.82(77.33)	14.36(209.33)	3.60(12.00)	5.25(26.67)	6.50(41.33)
PE Pyroxa + metribuzin@127.5+280 g/ha	9.14(82.67)	9.29(85.67)	11.97(144.00)	3.64(12.33)	5.16(25.67)	5.74(32.00)
Weedy Check	32.48(1056.67)	34.61(1197.33)	36.34(1321.00)	10.26(104.33)	16.98(287.33)	19.38(375.00)
Weed free	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)	1.00(0.00)
Mean	14.07(257.33)	17.59(392.64)	18.18(407.03)	5.18(30.47)	8.24(85.58)	10.41(133.86)
SEm	0.49(24.54)	0.61(22.42)	0.75(29.13)	0.14(1.56)	0.25(3.77)	0.36(7.78)
CD (0.05)	1.20(59.59)	1.49(54.43)	1.83(70.73)	0.33(3.79)	0.62(9.15)	0.88(18.88)
CV (%)	6.08(16.52)	6.04(9.89)	7.18(12.40)	4.60(8.87)	5.33(7.62)	6.04(10.06)
Date of Sowing :	17.11.2021			Date of Harvesting:		10.04.2022

Herbicide	Earheads/sqm	SPL-1		Bilaspur		2021-22
		Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm
PE Pendimethalin @ 1000 g/ha	333	27.6	40.93	37.43	92	84
PE Pendimethalin @ 1500 g/ha	334	27.8	41.49	38.39	92	85
PE Pyroxasulfone @ 127.5 g/ha	342	28.0	42.47	40.62	94	87
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	338	27.9	42.01	39.63	94	86
PE Pyroxa+metsulfuron 127.5+4 g/ha	348	28.1	43.04	41.70	94	87
EPOST Pyroxasulfone@ 127.5 g/ha	343	28.0	42.83	41.00	94	87
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	347	28.2	43.83	43.00	97	88
PE Metribuzin @300 g/ha	313	27.4	39.77	34.05	91	83
PE Pendi + metribuzin@1250+280 g/ha	317	27.6	40.20	35.00	91	84
PE Pyroxa + metribuzin@127.5+280 g/ha	336	27.8	41.98	39.06	93	86
Weedy Check	286	21.2	38.28	23.21	88	78
Weed free	352	28.9	44.81	45.48	100	91
CD (0.05)	12.64	3.0	3.52	3.15	5.75	3.41
Date of Sowing	20.11.2021					

Herbicide	Earheads/sqm	SPL-1		Durgapura		2021-22
		Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm
PE Pendimethalin @ 1000 g/ha	400	34.8	38.70	53.69	103	86
PE Pendimethalin @ 1500 g/ha	404	33.8	39.93	54.41	102	87
PE Pyroxasulfone @ 127.5 g/ha	406	35.6	38.60	55.68	102	87
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	444	34.8	39.80	61.33	101	94
PE Pyroxa+metsulfuron 127.5+4 g/ha	341	34.4	39.63	46.47	99	81
EPOST Pyroxasulfone@ 127.5 g/ha	375	33.6	40.10	50.45	101	84
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	437	34.0	39.47	58.69	101	91
PE Metribuzin @300 g/ha	318	35.8	38.43	43.79	102	78
PE Pendi + metribuzin@1250+280 g/ha	320	33.9	40.50	43.98	104	76
PE Pyroxa + metribuzin@127.5+280 g/ha	309	34.7	39.43	42.22	102	75
Weedy Check	297	35.0	39.33	40.95	102	87
Weed free	460	34.8	39.69	63.59	102	95
CD (0.05)	39.47	1.8	1.78	4.93	7.43	6.17
Date of Sowing	18.11.2021					

<b>Table 6.7.3. Central Zone</b>		<b>SPL-1</b>		<b>Jabalpur</b>		<b>2021-22</b>
Herbicide	Earheads/sqm	Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm
PE Pendimethalin @ 1000 g/ha	357	29.9	41.56	44.16	100	74
PE Pendimethalin @ 1500 g/ha	373	30.9	43.65	50.18	98	77
PE Pyroxasulfone @ 127.5 g/ha	370	31.1	43.52	50.10	99	77
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	380	34.4	43.08	56.20	100	80
PE Pyroxa+metsulfuron 127.5+4 g/ha	377	30.5	43.85	50.36	98	78
EPOST Pyroxasulfone@ 127.5 g/ha	363	30.9	43.44	48.36	100	75
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	397	31.7	45.20	56.77	100	84
PE Metribuzin @300 g/ha	362	29.3	43.40	45.89	97	75
PE Pendi + metribuzin@1250+280 g/ha	379	30.5	43.93	50.50	98	79
PE Pyroxa + metribuzin@127.5+280 g/ha	389	33.1	44.12	56.58	100	83
Weedy Check	231	29.4	41.78	28.03	95	73
Weed free	436	28.9	45.63	57.21	103	85
CD (0.05)	26.12	4.1	3.23	3.67	4.26	5.37
Date of Sowing	15.11.2021					

<b>Table 6.7.4. Central Zone</b>		<b>SPL-1</b>		<b>Junagarh</b>		<b>2021-22</b>
Herbicide	Earheads/sqm	Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm
PE Pendimethalin @ 1000 g/ha	440	24.8	47.67	51.94	202	69
PE Pendimethalin @ 1500 g/ha	447	23.7	48.07	50.82	203	70
PE Pyroxasulfone @ 127.5 g/ha	418	25.0	49.97	52.21	203	68
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	453	23.0	48.67	50.65	201	70
PE Pyroxa+metsulfuron 127.5+4 g/ha	427	25.6	48.90	53.23	206	69
EPOST Pyroxasulfone@ 127.5 g/ha	447	23.6	47.83	50.27	203	68
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	413	26.3	48.57	52.45	203	68
PE Metribuzin @300 g/ha	455	23.4	47.73	50.68	204	68
PE Pendi + metribuzin@1250+280 g/ha	425	25.6	47.93	52.18	202	68
PE Pyroxa + metribuzin@127.5+280 g/ha	435	25.1	49.17	53.43	202	71
Weedy Check	352	29.4	45.13	46.30	201	64
Weed free	470	24.7	48.20	55.84	202	73
CD (0.05)	27.73	2.6	1.71	3.35	2.48	4.01
Date of Sowing	18.11.2021					

<b>Table 6.7.5. Central Zone</b>		<b>SPL-1</b>		<b>Powarkheda</b>		<b>2021-22</b>
Herbicide	Earheads/sqm	Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm
PE Pendimethalin @ 1000 g/ha	368	34.8	31.62	40.43	173	73
PE Pendimethalin @ 1500 g/ha	405	33.3	33.31	44.53	167	74
PE Pyroxasulfone @ 127.5 g/ha	411	32.1	36.44	47.58	223	76
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	453	27.0	43.39	52.64	243	79
PE Pyroxa+metsulfuron 127.5+4 g/ha	422	23.2	50.62	49.34	178	77
EPOST Pyroxasulfone@ 127.5 g/ha	407	32.3	35.48	46.48	230	74
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	465	21.4	54.92	54.57	285	83
PE Metribuzin @300 g/ha	431	25.9	45.89	51.14	240	78
PE Pendi + metribuzin@1250+280 g/ha	455	22.4	53.49	54.29	253	82
PE Pyroxa + metribuzin@127.5+280 g/ha	416	28.4	41.40	48.35	205	77
Weedy Check	347	32.4	25.50	28.48	153	72
Weed free	497	20.1	56.05	55.86	292	76
CD (0.05)	29.06	3.8	4.86	1.98	26.35	7.06
Date of Sowing	23.11.21					

Herbicide	Earheads/sqm	SPL-1			Indore		2021-22	
		Grains/ Earhead	1000 grains weight, g	Yield, q/ha	Stand count	Plant height, cm		
PE Pendimethalin @ 1000 g/ha	249	38.0	52.40	49.63	158	101		
PE Pendimethalin @ 1500 g/ha	233	38.9	49.23	44.43	92	100		
PE Pyroxasulfone @ 127.5 g/ha	239	41.7	50.33	50.07	145	98		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	194	44.2	49.67	42.50	116	97		
PE Pyroxa+metsulfuron 127.5+4 g/ha	238	47.0	50.63	55.50	136	100		
EPOST Pyroxasulfone@ 127.5 g/ha	252	41.7	49.47	51.90	141	100		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	260	35.8	52.00	48.30	181	97		
PE Metribuzin @300 g/ha	257	36.6	47.77	44.90	81	98		
PE Pendi + metribuzin@1250+280 g/ha	251	37.9	47.53	45.23	78	95		
PE Pyroxa + metribuzin@127.5+280 g/ha	255	40.0	48.87	49.63	87	95		
Weedy Check	255	35.1	51.13	45.80	178	93		
Weed free	283	38.9	50.70	55.73	169	103		
CD (0.05)	23.25	5.4	1.21	3.45	21.12	2.62		
Date of Sowing	27.11.2021							

Herbicide	SPL-1			Bilaspur			2021-22	
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS		
PE Pendimethalin @ 1000 g/ha	10.2 (104.1)	4.7 (21.1)	5.2 (26.4)	3.9 (14.2)	3.6 (11.9)	3.1 (8.7)		
PE Pendimethalin @ 1500 g/ha	10.2 (104.5)	4.4 (19.0)	5.0 (24.0)	3.9 (13.9)	3.5 (11.4)	3.0 (8.3)		
PE Pyroxasulfone @ 127.5 g/ha	10.2 (103.7)	4.2 (16.7)	4.4 (18.6)	3.7 (12.9)	3.4 (10.8)	3.0 (7.9)		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	10.2 (103.8)	4.3 (17.8)	4.5 (19.6)	3.7 (13.0)	3.5 (11.0)	3.0 (8.2)		
PE Pyroxa+metsulfuron 127.5+4 g/ha	10.2 (102.7)	4.1 (16.5)	4.0 (15.2)	3.6 (12.2)	3.3 (10.1)	2.8 (7.1)		
EPOST Pyroxasulfone@ 127.5 g/ha	10.2 (103.4)	4.1 (16.5)	4.4 (18.3)	3.7 (12.9)	3.4 (10.7)	2.9 (7.3)		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	10.1 (101.0)	3.6 (12.2)	3.2 (9.09)	3.4 (10.7)	3.0 (7.9)	2.3 (4.3)		
PE Metribuzin @300 g/ha	10.4 (106.2)	4.8 (21.8)	5.3 (27.5)	3.8 (13.1)	3.6 (12.0)	3.1 (8.9)		
PE Pendi + metribuzin@1250+280 g/ha	10.3 (105.2)	4.7 (21.1)	5.2 (26.4)	4.0 (15.2)	3.6 (12.0)	3.1 (8.9)		
PE Pyroxa + metribuzin@127.5+280 g/ha	10.2(103.9)	4.3 (17.8)	4.8 (22.4)	3.9 (14.5)	3.5 (11.1)	3.0 (8.3)		
Weedy Check	10.4 (108.1)	14.5 (209.9)	17.2 (293.3)	4.2 (16.9)	9.8 (95.6)	5.3 (26.8)		
Weed free	1 (0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)		
CD (0.05)	0.14(2.91)	0.25 (2.82)	0.26 (2.71)	0.20 (1.48)	0.17 (1.58)	0.22 (1.30)		
Date of Sowing:				Date of Harvesting	05.04.2022			

Herbicide	SPL-1			Durgapura			2021-22	
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS		
PE Pendimethalin @ 1000 g/ha	6.1(36.7)	7.1 (50.6)	7.6 (58.0)	3.3 (9.8)	4.6 (20.5)	8.7 (75.4)		
PE Pendimethalin @ 1500 g/ha	6.0(36.0)	7.2 (52.0)	7.6 (58.3)	3.3 (9.7)	4.4 (18.6)	8.6 (74.9)		
PE Pyroxasulfone @ 127.5 g/ha	6.0 (35.3)	6.8 (45.0)	7.2 (51.3)	3.1 (8.5)	4.4 (18.5)	7.9 (62.8)		
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.9 (14.7)	5.3 (27.3)	5.5 (30.3)	3.0 (7.9)	4.0 (14.8)	6.2 (38.7)		
PE Pyroxa+metsulfuron 127.5+4 g/ha	7.9 (62.7)	8.8 (77.3)	9.3 (86.6)	3.4 (10.7)	4.8 (22.0)	11.4 (129.5)		
EPOST Pyroxasulfone@ 127.5 g/ha	7.6 (58.0)	8.6 (73.7)	9.2 (84.6)	3.3 (10.1)	4.7 (21.3)	10.9 (118.8)		
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	5.7 (32.3)	6.4 (41.0)	7.0 (48.0)	3.1 (8.4)	4.2 (16.7)	7.9 (63.1)		
PE Metribuzin @300 g/ha	8.7 (75.0)	9.6 (92.3)	10.5 (109.0)	3.6 (11.7)	5.8 (32.5)	12.2 (152.1)		
PE Pendi + metribuzin@1250+280 g/ha	9.1 (82.3)	10.3 (104.7)	12.4 (153.3)	3.7 (12.9)	6.3 (38.7)	22.0 (491.9)		
PE Pyroxa + metribuzin@127.5+280 g/ha	9.5 (90.0)	10.8 (117.0)	12.2 (147.6)	3.6 (12.3)	6.0 (35.4)	19 (363.7)		
Weedy Check	12.3 (151.3)	13.5 (182.3)	14.5 (208.0)	4.3 (17.6)	8.0 (64.3)	30.9 (952.1)		
Weed free	1.0 (0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)		
CD (0.05)	1.21 (19.02)	1.19 (19.3)	1.18 (20.3)	0.36 (2.71)	0.89 (11.92)	2.43 (87.9)		
Date of Sowing:				Date of Harvesting	22.03.2022			

Herbicide	SPL-1			Jabalpur		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	7.2(50.9)	7.2 (50.7)	6.9 (47.0)	9.1 (81.8)	8.4 (70.1)	8.3 (68.3)
PE Pendimethalin @ 1500 g/ha	5.8 (33.2)	5.1 (25.0)	4.9 (22.7)	6.6 (42.5)	6.3 (39.0)	5.7 (31.1)
PE Pyroxasulfone @ 127.5 g/ha	6.1 (36.7)	5.7 (31.8)	5.5 (29.1)	7.5 (54.6)	6.8 (45.4)	6.1 (35.9)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	5.1 (25.3)	4.6 (20.5)	4.3 (17.3)	5.4 (28.5)	5.1 (25.1)	4.8 (21.8)
PE Pyroxa+metsulfuron 127.5+4 g/ha	5.6 (30.5)	4.9 (23.01)	4.7 (21.0)	6.2 (37.4)	5.8 (32.6)	5.3 (27.3)
EPOST Pyroxasulfone@ 127.5 g/ha	6.6 (42.9)	6.3 (39.0)	5.8 (32.5)	8.2 (66.2)	7.4 (53.3)	6.8 (44.8)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.1 (15.7)	3.8 (13.7)	3.6 (11.9)	4.5 (19.1)	4.0 (14.9)	3.6 (11.8)
PE Metribuzin @300 g/ha	7.1 (49.9)	6.8 (44.8)	6.5 (41.1)	8.8 (76.2)	8.0 (62.4)	7.2 (50.4)
PE Pendi + metribuzin@1250+280 g/ha	5.3 (27.4)	4.7 (21.5)	4.5 (19.2)	5.6 (30.6)	5.3 (27.2)	5.0 (23.7)
PE Pyroxa + metribuzin@127.5+280 g/ha	4.7 (20.7)	4.2 (16.4)	3.8 (13.1)	4.8 (22.3)	4.5 (19.4)	4.0 (15.2)
Weedy Check	9.9 (97.5)	10.9 (116.9)	12.3 (150.9)	10.9 (118.0)	12 (149.2)	13.4 (178.1)
Weed free	3.7 (12.9)	3.1 (8.80)	2.8 (7.1)	3.6 (12.2)	3.4 (10.7)	3.1 (8.4)
CD (0.05)	0.28 (3.28)	0.28 (3.38)	0.35 (3.44)	0.34 (4.1)	0.34 (3.7)	2.43 (3.76)
Date of Sowing:	Date of Harvesting				28.03.2022	

Herbicide	SPL-1			Junagadh		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	3.9 (15.0)	4.6 (20.0)	4.8 (22.3)	8.2 (68.3)	11.4 (130.8)	14.5 (213.1)
PE Pendimethalin @ 1500 g/ha	3.8 (14.0)	4.5 (19.3)	4.5 (19.6)	8.0 (63.8)	11.2 (126.1)	13.6 (185.6)
PE Pyroxasulfone @ 127.5 g/ha	3.9 (14.6)	5.0 (23.6)	4.7 (21.6)	8.1 (65.5)	12.4 (153.1)	14.3 (204.8)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	3.5 (11.6)	4.6 (20.6)	4.7 (21.3)	7.3 (53.3)	11.6 (136.1)	14.2 (204.6)
PE Pyroxa+metsulfuron 127.5+4 g/ha	4.0 (16.0)	5.2 (26.3)	5.2 (26.3)	8.4 (71.0)	13.1 (170.3)	15.8 (249.3)
EPOST Pyroxasulfone@ 127.5 g/ha	4.2 (17.3)	4.9 (23.3)	4.8 (22.3)	8.8 (76.8)	12.3 (153.0)	14.5 (210.8)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.0 (16.0)	4.8 (22.0)	4.9 (23.3)	8.6 (73.6)	11.9 (142.0)	14.9 (222.6)
PE Metribuzin @300 g/ha	4.0 (16.0)	5.0 (23.6)	4.7 (21.3)	8.4 (71.2)	12.4 (155.0)	14.2 (204.6)
PE Pendi + metribuzin@1250+280 g/ha	4.1 (16.0)	4.9 (22.6)	4.9 (23.3)	8.5 (71.0)	12.1 (146.8)	14.8 (222.3)
PE Pyroxa + metribuzin@127.5+280 g/ha	4.2 (17.0)	5.0 (23.6)	4.8 (22.6)	8.7 (77.5)	12.4 (154.5)	14.6 (215.8)
Weedy Check	11.9 (142.3)	12.3 (151.0)	12.3 (150.3)	25.3 (638.3)	31.3 (983.5)	37.8 (1430.6)
Weed free	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)
CD (0.05)	0.83 (7.69)	0.60 (6.94)	0.80 (9.32)	1.90 (38.89)	1.98 (67.1)	2.79 (107.8)
Date of Sowing:	Date of Harvesting				09.03.2022	

Herbicide	SPL-1			Powarkheda		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	7.1 (50.3)	7.3 (52.6)	7.0 (48.0)	9.2 (83.6)	8.5 (72.1)	8.4 (69.9)
PE Pendimethalin @ 1500 g/ha	7.0 (49.3)	6.9 (46.6)	6.6 (42.1)	7.6 (56.4)	7.0 (47.4)	7.3 (52.0)
PE Pyroxasulfone @ 127.5 g/ha	6.1 (36.2)	5.9 (33.6)	5.6 (30.1)	8.9 (77.9)	8.1 (64.4)	6.2 (37.5)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	5.0 (24.74)	4.8 (22.3)	4.4 (18.3)	5.6 (30.3)	5.3 (27.1)	4.9 (23.4)
PE Pyroxa+metsulfuron 127.5+4 g/ha	5.5 (30.01)	5.1 (24.8)	4.8 (21.9)	5.8 (32.4)	6.0 (34.6)	5.5 (28.9)
EPOST Pyroxasulfone@ 127.5 g/ha	6.5 (42.3)	6.5 (40.8)	5.9 (33.5)	8.3 (67.9)	7.5 (55.3)	6.9 (46.4)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	4.0(15.1)	4.1 (15.5)	3.9 (14.1)	4.7 (20.9)	4.2 (16.9)	3.8 (13.3)
PE Metribuzin @300 g/ha	5.2 (26.8)	4.9 (23.4)	4.6 (20.1)	6.3 (39.1)	4.7 (21.5)	4.2 (16.8)
PE Pendi + metribuzin@1250+280 g/ha	4.5 (20.1)	4.4 (18.3)	3.7 (12.8)	5.0 (24.1)	5.5 (29.2)	5.1 (25.3)
PE Pyroxa + metribuzin@127.5+280 g/ha	5.7 (32.6)	5.3 (26.8)	5.0 (23.7)	6.7 (44.2)	6.5 (41.1)	5.8 (32.7)
Weedy Check	9.8 (96.9)	10.9 (118.8)	12.4 (151.8)	11.0 (119.8)	12.3 (151.2)	13.4 (179.7)
Weed free	3.6 (12.3)	3.4 (10.7)	3.0 (8.0)	3.9 (14.0)	3.7 (12.7)	3.3 (10.1)
CD (0.05)	0.21 (2.55)	0.19 (2.81)	0.2 (1.94)	0.24 (3.58)	0.23 (2.65)	0.21 (2.07)
Date of Sowing:	Date of Harvesting				07.04.2022	

Herbicide	SPL-1			Indore		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	7.1 (51.0)	4.4 (18.5)	3.5 (11.2)	4.14 (16.5)	2.9 (7.3)	3.6 (11.9)
PE Pendimethalin @ 1500 g/ha	8.3 (70.0)	3.1 (9.0)	2.7 (6.3)	4.35 (17.9)	1.8 (2.2)	3.0 (8.1)
PE Pyroxasulfone @ 127.5 g/ha	8.9 (80.0)	3.3 (10.0)	3.0 (8.3)	4.18 (16.7)	2.3 (4.4)	3.7 (12.8)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	6.7 (45.1)	3.7 (12.5)	3.4 (10.8)	3.96 (14.9)	2.6 (6.1)	3.2 (10.1)
PE Pyroxa+metsulfuron 127.5+4 g/ha	7.5 (57.0)	3.7 (12.6)	3.5 (11.0)	3.97 (14.9)	2.7 (6.1)	3.3 (9.6)
EPOST Pyroxasulfone@ 127.5 g/ha	8.5 (74.5)	3.6 (12.6)	3.4 (10.6)	4.01 (15.2)	2.9 (7.2)	3.6 (11.7)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	8.2 (67.6)	3.7 (12.5)	3.1 (9.0)	4.13 (16.0)	2.4 (5.1)	3.6 (12.1)
PE Metribuzin @300 g/ha	6.7 (47.3)	3.7 (13.0)	3.8 (13.8)	3.93 (14.5)	2.8 (7.1)	3.6 (12.4)
PE Pendi + metribuzin@1250+280 g/ha	9.2 (86.1)	3.9 (14.3)	3.1 (8.6)	4.1 (15.9)	2.9 (7.6)	3.0 (8.4)
PE Pyroxa + metribuzin@127.5+280 g/ha	12.1 (176.8)	3.2 (9.2)	3.5 (11.5)	4.0 (15.1)	2.5 (5.4)	2.5 (5.5)
Weedy Check	8.4 (70.5)	8.0 (63.6)	6.3 (38.8)	4.2 (16.8)	6.0 (35.4)	7.4 (54.1)
Weed free	1.0 (0.0)	1.0(0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)
CD (0.05)	3.21 (83.79)	0.67 (6.93)	0.61 (4.38)	0.58 (4.69)	0.40 (2.98)	0.84 (6.69)
Date of Sowing:					Date of Harvesting	09.04.2022

Herbicide	Yield, q/ha	SPL-1		Dharwad		2021-22
		Earheads/ sqm	1000 GW, g	Grains/ Earhead	Lodging score	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	35.28	187	35.83	53.45	3.07	65.33
PE Pendimethalin @ 1500 g/ha	36.47	201	38.51	47.42	2.83	59.14
PE Pyroxasulfone @ 127.5 g/ha	37.63	195	37.05	52.28	3.13	61.87
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	39.10	188	36.11	58.85	4.20	62.77
PE Pyroxa+metsulfuron 127.5+4 g/ha	39.68	191	36.53	57.33	3.07	65.12
EPOST Pyroxasulfone@ 127.5 g/ha	37.04	225	36.19	46.69	3.03	70.14
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	39.75	208	38.20	50.35	3.43	67.49
PE Metribuzin @300 g/ha	37.28	230	36.90	44.69	3.67	75.60
PE Pendi + metribuzin@1250+280 g/ha	40.11	210	39.14	49.39	2.80	72.90
PE Pyroxa + metribuzin@127.5+280 g/ha	40.00	209	37.35	51.95	3.50	70.25
Weedy Check	27.73	158	31.72	55.91	4.30	53.39
Weed free	37.36	198	37.97	50.11	2.70	68.18
Mean	37.29	200	36.79	51.54	3.31	66.01
SEm	2.57	10.87	1.99	5.13	0.24	3.36
CD (0.05)	6.25	26.39	4.83	12.46	0.59	8.17
CV (%)	11.95	9.42	9.36	17.24	12.79	8.83
Date of Sowing :	14.11.2021	Date of Harvesting:		19.03.2022		

Herbicide	Yield, q/ha	SPL-1		Pune	2021-22
		Earheads/ sqm	1000 GW, g	Grains/ Earhead	Biomass, q/ha
PE Pendimethalin @ 1000 g/ha	65.38	450	44.43	32.74	136.83
PE Pendimethalin @ 1500 g/ha	62.58	430	47.57	31.39	145.44
PE Pyroxasulfone @ 127.5 g/ha	59.02	487	46.27	26.21	127.92
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	45.71	320	43.07	33.56	109.78
PE Pyroxa+metsulfuron 127.5+4 g/ha	61.64	435	44.90	32.00	138.30
EPOST Pyroxasulfone@ 127.5 g/ha	61.69	423	47.00	31.10	134.80
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	57.42	337	47.13	36.39	126.14
PE Metribuzin @300 g/ha	53.85	420	45.87	28.31	124.55
PE Pendi + metribuzin@1250+280 g/ha	63.83	470	44.73	30.94	134.78
PE Pyroxa + metribuzin@127.5+280 g/ha	56.12	432	44.27	29.67	119.92
Weedy Check	64.26	418	46.57	34.33	137.27
Weed free	67.04	342	45.30	43.28	144.28
Mean	59.88	414	45.59	32.49	131.67
SEm	2.71	27.58	0.94	1.98	5.61
CD (0.05)	6.57	66.97	2.28	4.80	13.62
CV (%)	7.83	11.55	3.57	10.53	7.38
Date of Sowing :	15.11.2021	Date of Harvesting:		21.03.2022	

Herbicide	SPL-1			Dharwad		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	3.49 (11.33)	4.04 (15.33)	3.94 (14.67)	2.89 (7.57)	3.73 (13.0)	3.50 (11.50)
PE Pendimethalin @ 1500 g/ha	3.20 (9.33)	3.83 (13.67)	3.64 (12.33)	2.77 (6.80)	3.39 (10.53)	3.13 (8.97)
PE Pyroxasulfone @ 127.5 g/ha	3.40 (10.67)	3.63 (12.33)	4.19 (16.67)	2.81 (7.10)	3.06 (8.50)	3.70 (12.83)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	2.88 (7.33)	3.81 (13.67)	3.78 (13.33)	2.31 (4.40)	3.22 (9.53)	3.25 (9.67)
PE Pyroxa+metsulfuron 127.5+4 g/ha	2.86 (7.33)	3.15 (9.0)	3.98 (15.0)	2.25 (4.17)	2.78 (6.80)	3.31 (10.10)
EPOST Pyroxasulfone@ 127.5 g/ha	3.20 (9.33)	3.64 (12.33)	3.78 (13.33)	2.51 (5.50)	3.15 (8.97)	3.39 (10.53)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	2.93 (7.67)	3.59 (12.0)	3.91 (14.33)	2.47 (5.17)	3.09 (8.63)	3.36 (10.40)
PE Metribuzin @300 g/ha	2.86 (7.33)	3.20 (9.33)	3.46 (11.0)	2.18 (3.77)	2.71 (6.47)	3.0 (8.07)
PE Pendi + metribuzin@1250+280 g/ha	2.74 (6.67)	2.93 (7.67)	3.05 (8.33)	2.15 (3.83)	2.59 (5.70)	2.50 (5.33)
PE Pyroxa + metribuzin@127.5+280 g/ha	2.99 (8.0)	3.25 (9.67)	3.36 (10.33)	2.35 (4.63)	2.71 (6.53)	2.86 (7.20)
Weedy Check	5.38 (28.0)	5.71 (31.67)	6.35 (39.33)	4.76 (21.70)	5.35 (27.63)	5.75 (32.13)
Weed free	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)
Mean	3.08 (9.42)	3.48 (12.22)	3.70 (14.06)	2.54 (6.22)	3.07 (9.36)	3.23 (10.56)
SEm	0.21 (1.34)	0.20 (1.46)	0.19 (1.54)	0.24 (1.27)	0.20 (1.29)	0.22 (1.60)
CD (0.05)	0.51 (3.26)	0.50 (3.56)	0.46 (3.73)	0.59 (3.09)	0.49 (3.14)	0.53 (3.89)
CV (%)	11.8 (24.68)	10.15 (20.76)	8.95 (18.92)	16.64 (35.43)	11.52 (23.91)	11.79 (26.25)
Date of Sowing :	14.11.2021		Date of Harvesting:		19.03.2022	

Herbicide	SPL-1			Pune		2021-22
	Weed Count 30 DAS	Weed Count 60 DAS	Weed Count 90 DAS	Weed dry wt. 30 DAS	Weed dry wt. 60 DAS	Weed dry wt. 90 DAS
PE Pendimethalin @ 1000 g/ha	4.38 (18.27)	1.99 (3.0)	1.57 (1.5)	6.30 (40.0)	2.58 (6.03)	1.53 (1.37)
PE Pendimethalin @ 1500 g/ha	3.92 (14.70)	2.05 (3.37)	1.65 (1.73)	5.59 (31.93)	2.26 (4.43)	1.58 (1.53)
PE Pyroxasulfone @ 127.5 g/ha	4.41 (19.20)	2.66 (6.33)	2.43 (4.90)	6.00 (36.97)	3.93 (14.90)	2.62 (6.0)
PE Pendi + Pyroxa @ 1250 + 127.5 g/ha	4.91 (24.60)	3.62 (13.90)	3.77 (16.70)	6.61 (45.50)	4.39 (19.47)	3.73 (17.13)
PE Pyroxa+metsulfuron 127.5+4 g/ha	3.62 (12.33)	3.01 (8.77)	2.35(5.07)	3.92 (15.0)	3.73 (13.27)	2.06 (3.40)
EPOST Pyroxasulfone@ 127.5 g/ha	9.95 (99.70)	4.21 (18.10)	2.90 (8.37)	15.57 (251.33)	3.80 (13.67)	3.11 (8.67)
EPOST Pyroxa + metsul @ 127.5 + 4 g/ha	10.32 (105.67)	4.87 (32.43)	2.67 (7.63)	16.42 (275.53)	4.60 (21.97)	2.52 (5.70)
PE Metribuzin @300 g/ha	7.88 (61.43)	4.05 (16.73)	3.51 (13.77)	12.44 (157.83)	4.42 (19.23)	2.76 (6.83)
PE Pendi + metribuzin@1250+280 g/ha	4.56 (20.0)	2.57 (6.47)	2.73 (7.37)	6.32 (39.03)	3.75 (13.27)	3.12 (9.53)
PE Pyroxa + metribuzin@127.5+280 g/ha	4.95 (24.37)	3.15 (9.4)	2.75 (6.63)	6.08 (36.83)	4.60 (21.47)	4.73 (22.57)
Weedy Check	10.58 (112.37)	1.79 (2.23)	2.34 (4.83)	17.64 (315.70)	3.10 (8.93)	3.35 (10.97)
Weed free	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)	1.0 (0.0)
Mean	5.87 (42.72)	2.91 (10.06)	2.47 (6.54)	8.66 (103.81)	3.51 (13.05)	2.67 (7.81)
SEm	0.58 (8.88)	0.75 (8.05)	0.58 (4.03)	1.22 (33.13)	0.50 (4.19)	0.57 (4.24)
CD (0.05)	1.41 (21.57)	1.82 (19.54)	1.42 (9.80)	2.95 (80.45)	1.20 (10.17)	1.38 (10.30)
CV (%)	17.13 (36.01)	44.57 (138.51)	40.94 (106.81)	24.31 (55.28)	24.42 (55.59)	36.80 (94.13)
Date of Sowing :	15.11.2021		Date of Harvesting:		21.03.2022	

Table 6.11.1. Northern Hill Zone

Foliar application	SPL-2				Mean	Rk
	Seed treatment with seaweed extract					
	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	40.73	6	43.20	6	41.97	6
Seaweed ext 4ml/lit tillering	41.71	5	44.99	5	43.35	5
Seaweed ext 2ml/lit heading	42.04	4	45.29	4	43.67	4
Seaweed ext 4ml/lit heading	42.69	3	46.29	1	44.49	3
Seaweed ext 2ml/lit tillering & heading	44.63	1	45.55	3	45.09	2
Seaweed ext 4ml/lit tillering & heading	44.58	2	46.01	2	45.30	1
Mean	42.73		45.22		43.98	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	*		0.35		1.43	3.34
Foliar application (B)	N.S.		0.90		2.20	5.01
B within A	N.S.		1.27		3.11	
A within B			1.21		2.96	
<b>Earhead/sqm</b>						
Seaweed ext 2ml/lit tillering	344	4	376	1	360	4
Seaweed ext 4ml/lit tillering	333	6	350	6	341	6
Seaweed ext 2ml/lit heading	370	3	352	5	361	3
Seaweed ext 4ml/lit heading	373	2	359	4	366	2
Seaweed ext 2ml/lit tillering & heading	338	5	374	2	356	5
Seaweed ext 4ml/lit tillering & heading	378	1	373	3	375	1
Mean	356		364		360	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.		4.97		20.51	5.85
Foliar application (B)	N.S.		11.00		26.83	7.48
B within A	N.S.		15.55		37.94	
A within B			15.04		36.69	
<b>Grains/earhead</b>						
Seaweed ext 2ml/lit tillering	27.10	3	26.14	6	26.62	6
Seaweed ext 4ml/lit tillering	29.07	2	28.67	3	28.87	1
Seaweed ext 2ml/lit heading	25.80	6	29.09	1	27.44	3
Seaweed ext 4ml/lit heading	25.84	5	28.76	2	27.30	4
Seaweed ext 2ml/lit tillering & heading	30.39	1	27.16	5	28.78	2
Seaweed ext 4ml/lit tillering & heading	26.65	4	27.40	4	27.02	5
Mean	27.47		27.87		27.67	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.		0.81		3.33	12.35
Foliar application (B)	N.S.		0.77		1.87	6.80
B within A	N.S.		1.09		2.65	
A within B			1.28		3.12	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	43.98	4	44.07	6	44.03	6
Seaweed ext 4ml/lit tillering	43.34	6	44.83	4	44.09	5
Seaweed ext 2ml/lit heading	44.30	2	44.37	5	44.33	4
Seaweed ext 4ml/lit heading	44.25	3	44.85	3	44.55	2
Seaweed ext 2ml/lit tillering & heading	43.67	5	45.37	1	44.52	3
Seaweed ext 4ml/lit tillering & heading	44.42	1	45.36	2	44.89	1
Mean	43.99		44.81		44.40	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.		0.38		1.58	3.66
Foliar application (B)	N.S.		0.40		0.98	2.23
B within A	N.S.		0.57		1.39	
A within B			0.65		1.58	

<b>Biomass, q/ha</b>						
Seaweed ext 2ml/lit tillering	92.95	6	98.65	6	95.80	6
Seaweed ext 4ml/lit tillering	94.64	4	101.34	3	97.99	4
Seaweed ext 2ml/lit heading	93.44	5	100.66	4	97.05	5
Seaweed ext 4ml/lit heading	96.30	3	104.12	1	100.21	2
Seaweed ext 2ml/lit tillering & heading	103.05	1	101.78	2	102.41	1
Seaweed ext 4ml/lit tillering & heading	99.65	2	100.35	5	100.00	3
Mean	96.67		101.15		98.91	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.		3.25		13.44	13.96
Foliar application (B)	N.S.		2.55		6.23	6.32
B within A	N.S.		3.61		8.80	
A within B			4.63		11.30	
<b>Plant height, cm</b>						
Seaweed ext 2ml/lit tillering	94.6	2	94.3	2	94.4	2
Seaweed ext 4ml/lit tillering	95.5	1	94.2	3	94.8	1
Seaweed ext 2ml/lit heading	91.9	6	95.4	1	93.7	4
Seaweed ext 4ml/lit heading	92.3	5	93.7	5	93.0	5
Seaweed ext 2ml/lit tillering & heading	92.3	4	92.1	6	92.2	6
Seaweed ext 4ml/lit tillering & heading	93.6	3	94.2	3	93.9	3
Mean	93.4		94.0		93.7	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.		0.37		1.54	1.69
Foliar application (B)	N.S.		0.78		1.91	2.05
B within A	N.S.		1.11		2.71	
A within B			1.08		2.63	
Date of Sowing:	26.10.2021	Date of Harvesting:	25.05.2022			

**Table 6.11.2. Northern Hill Zone**

Foliar application	<b>SPL-2</b>				<b>Malan</b>	<b>2021-22</b>
	Seed treatment with seaweed extract				Mean	Rk
	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	35.40	6	40.67	6	38.04	6
Seaweed ext 4ml/lit tillering	36.03	5	42.04	4	39.04	5
Seaweed ext 2ml/lit heading	37.99	4	41.22	5	39.61	4
Seaweed ext 4ml/lit heading	39.68	3	43.17	3	41.43	3
Seaweed ext 2ml/lit tillering & heading	41.11	2	44.26	2	42.69	2
Seaweed ext 4ml/lit tillering & heading	44.64	1	49.11	1	46.88	1
Mean	39.14		43.41		41.28	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	*		0.60		2.47	6.14
Foliar application (B)	**		0.87		2.11	5.14
B within A	N.S.		1.22		2.99	
A within B			1.27		3.09	
<b>Earhead/sqm</b>						
Seaweed ext 2ml/lit tillering	415	6	425	6	420	6
Seaweed ext 4ml/lit tillering	423	4	433	4	428	5
Seaweed ext 2ml/lit heading	429	3	432	5	431	4
Seaweed ext 4ml/lit heading	434	1	435	3	435	2
Seaweed ext 2ml/lit tillering & heading	423	4	438	2	431	3
Seaweed ext 4ml/lit tillering & heading	434	2	470	1	452	1
Mean	427		439		433	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	*		1.91		7.87	1.87
Foliar application (B)	**		2.74		6.69	1.55
B within A	**		3.88		9.46	
A within B			4.02		9.81	



<b>Grains/earhead</b>						
Seaweed ext 2ml/lit tillering	21.00	6	24.21	3	22.60	4
Seaweed ext 4ml/lit tillering	21.16	5	23.54	5	22.35	6
Seaweed ext 2ml/lit heading	21.69	4	23.23	6	22.46	5
Seaweed ext 4ml/lit heading	22.16	3	24.19	4	23.17	3
Seaweed ext 2ml/lit tillering & heading	23.76	2	24.54	2	24.15	2
Seaweed ext 4ml/lit tillering & heading	24.90	1	25.04	1	24.97	1
Mean	22.44		24.13		23.29	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.	0.364	1.50	6.6	8.64	20.10
Foliar application (B)	**	0.463	1.13	4.9	4.61	12.76
B within A	N.S.	0.655	1.60		6.52	
A within B		0.7	1.71		7.28	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	40.61	5	39.55	6	40.08	6
Seaweed ext 4ml/lit tillering	40.24	6	41.19	2	40.71	5
Seaweed ext 2ml/lit heading	40.83	4	41.14	4	40.99	4
Seaweed ext 4ml/lit heading	41.25	2	41.00	5	41.13	2
Seaweed ext 2ml/lit tillering & heading	40.89	3	41.16	3	41.03	3
Seaweed ext 4ml/lit tillering & heading	41.29	1	41.75	1	41.52	1
Mean	40.85		40.97		40.91	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	N.S.	0.087	0.36	0.9	9.60	16.89
Foliar application (B)	*	0.295	0.72	1.8	4.70	9.84
B within A	N.S.	0.417	1.02		6.64	
A within B		0.391	0.95		7.64	
<b>Biomass, q/ha</b>						
Seaweed ext 2ml/lit tillering	80.73	6	93.63	6	87.18	6
Seaweed ext 4ml/lit tillering	84.32	5	97.88	4	91.10	5
Seaweed ext 2ml/lit heading	88.52	4	96.73	5	92.63	4
Seaweed ext 4ml/lit heading	91.13	3	99.22	3	95.18	3
Seaweed ext 2ml/lit tillering & heading	94.41	2	105.66	2	100.03	2
Seaweed ext 4ml/lit tillering & heading	102.98	1	114.62	1	108.80	1
Mean	90.35		101.29		95.82	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	*		1.49		6.16	6.61
Foliar application (B)	**		1.94		4.73	4.95
B within A	N.S.		2.74		6.69	
A within B			2.91		7.11	
<b>Plant height, cm</b>						
Seaweed ext 2ml/lit tillering	85.0	6	89.3	6	87.2	6
Seaweed ext 4ml/lit tillering	86.0	4	91.0	5	88.5	5
Seaweed ext 2ml/lit heading	85.7	5	94.0	4	89.8	4
Seaweed ext 4ml/lit heading	87.7	3	95.7	3	91.7	3
Seaweed ext 2ml/lit tillering & heading	88.0	2	96.3	2	92.2	2
Seaweed ext 4ml/lit tillering & heading	91.7	1	98.0	1	94.8	1
Mean	87.3		94.1		90.7	
	F Test		SEm		CD	CV (%)
Seed treatment (A)	**		0.10		0.43	0.49
Foliar application (B)	**		0.61		1.48	1.64
B within A	N.S.		0.86		2.09	
A within B			0.79		1.93	
Date of Sowing:	27.11.2020	Date of Harvesting:	03.04.2021			

Foliar application	SPL-2		Delhi		2021-22	
	Seed treatment with seaweed extract				Mean	Rk
	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	53.28	4	53.78	5	53.53	4
Seaweed ext 4ml/lit tillering	53.85	3	54.83	3	54.34	3
Seaweed ext 2ml/lit heading	52.92	6	53.62	6	53.27	6
Seaweed ext 4ml/lit heading	53.03	5	53.97	4	53.50	5
Seaweed ext 2ml/lit tillering & heading	53.90	2	55.02	2	54.46	2
Seaweed ext 4ml/lit tillering & heading	54.98	1	56.20	1	55.59	1
Mean	53.66		54.57		54.12	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.03	0.12		0.23	
Foliar application (B)	**	0.03	0.07		0.13	
B within A	**	0.04	0.10			
A within B		0.05	0.12			
<b>Earheads/sq.m</b>						
Seaweed ext 2ml/lit tillering	470	4	491	5	480	5
Seaweed ext 4ml/lit tillering	496	2	502	4	499	3
Seaweed ext 2ml/lit heading	443	6	483	6	463	6
Seaweed ext 4ml/lit heading	467	5	503	3	485	4
Seaweed ext 2ml/lit tillering & heading	493	3	529	2	511	2
Seaweed ext 4ml/lit tillering & heading	516	1	540	1	528	1
Mean	481		508		494	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.60	2.50		0.52	
Foliar application (B)	**	4.30	10.48		2.13	
B within A	N.S.	6.08	14.82			
A within B		5.58	13.61			
<b>1000 grains weight, g</b>						
Seaweed ext 2ml/lit tillering	39.17	3	39.88	3	39.52	3
Seaweed ext 4ml/lit tillering	39.50	2	40.23	2	39.86	2
Seaweed ext 2ml/lit heading	38.34	6	39.08	6	38.71	6
Seaweed ext 4ml/lit heading	38.60	5	39.33	5	38.97	5
Seaweed ext 2ml/lit tillering & heading	38.95	4	39.70	4	39.33	4
Seaweed ext 4ml/lit tillering & heading	40.32	1	40.98	1	40.65	1
Mean	39.15		39.87		39.51	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.14	0.59		1.54	
Foliar application (B)	**	0.13	0.32		0.82	
B within A	N.S.	0.19	0.46			
A within B		0.22	0.54			
<b>Grains per ear head</b>						
Seaweed ext 2ml/lit tillering	29.02	3	27.52	2	28.27	3
Seaweed ext 4ml/lit tillering	27.50	5	27.17	4	27.34	4
Seaweed ext 2ml/lit heading	31.20	1	28.46	1	29.83	1
Seaweed ext 4ml/lit heading	29.46	2	27.34	3	28.40	2
Seaweed ext 2ml/lit tillering & heading	28.10	4	26.24	5	27.17	5
Seaweed ext 4ml/lit tillering & heading	26.45	6	25.48	6	25.97	6
Mean	28.62		27.03		27.83	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.08	0.32		1.17	
Foliar application (B)	**	0.23	0.56		2.01	
B within A	*	0.32	0.79			
A within B		0.30	0.74			

<b>Biomass, q/ha</b>						
Seaweed ext 2ml/lit tillering	129.50	4	131.17	6	130.33	5
Seaweed ext 4ml/lit tillering	132.00	2	132.83	4	132.42	3
Seaweed ext 2ml/lit heading	128.00	6	131.67	5	129.83	6
Seaweed ext 4ml/lit heading	129.33	5	133.33	3	131.33	4
Seaweed ext 2ml/lit tillering & heading	132.00	2	135.00	2	133.50	2
Seaweed ext 4ml/lit tillering & heading	133.67	1	137.00	1	135.33	1
Mean	130.75		133.50		132.13	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.07	0.28		0.22	
Foliar application (B)	**	0.28	0.67		0.51	
B within A	**	0.39	0.95			
A within B		0.36	0.89			
Date of Sowing:	10.11.2021		Date of Harvesting:	26.03.2022		

**Table 6.12.2. North Western Plains Zone****SPL-2****Gurdaspur****2021-22**

Foliar application	Seed treatment with seaweed extract				Mean	Rk
	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	51.54	6	54.06	3	52.80	6
Seaweed ext 4ml/lit tillering	52.64	4	53.36	5	53.00	5
Seaweed ext 2ml/lit heading	52.03	5	54.68	2	53.35	4
Seaweed ext 4ml/lit heading	54.88	2	52.93	6	53.91	3
Seaweed ext 2ml/lit tillering & heading	55.25	1	53.87	4	54.56	2
Seaweed ext 4ml/lit tillering & heading	53.24	3	56.38	1	54.81	1
Mean	53.26		54.21		53.74	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.46	1.92		3.67	
Foliar application (B)	N.S.	0.70	1.72		3.21	
B within A	N.S.	1.00	2.43			
A within B		1.02	2.49			
<b>Earheads/sq.m</b>						
Seaweed ext 2ml/lit tillering	337	6	372	2	354	6
Seaweed ext 4ml/lit tillering	337	5	378	1	357	3
Seaweed ext 2ml/lit heading	358	4	355	4	356	5
Seaweed ext 4ml/lit heading	372	2	343	6	357	3
Seaweed ext 2ml/lit tillering & heading	359	3	360	3	359	2
Seaweed ext 4ml/lit tillering & heading	378	1	351	5	364	1
Mean	357		360		358	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	2.40	9.92		2.85	
Foliar application (B)	N.S.	3.93	9.59		2.69	
B within A	**	5.56	13.56			
A within B		5.61	13.69			
<b>1000 grains weight, g</b>						
Seaweed ext 2ml/lit tillering	36.69	5	36.94	5	36.81	5
Seaweed ext 4ml/lit tillering	36.21	6	36.30	6	36.25	6
Seaweed ext 2ml/lit heading	37.46	4	37.87	4	37.66	4
Seaweed ext 4ml/lit heading	37.56	3	39.22	1	38.39	3
Seaweed ext 2ml/lit tillering & heading	37.79	2	39.16	3	38.48	2
Seaweed ext 4ml/lit tillering & heading	38.00	1	39.22	2	38.61	1
Mean	37.28		38.12		37.70	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.61	2.52		6.87	
Foliar application (B)	N.S.	0.94	2.30		6.12	
B within A	N.S.	1.33	3.25			
A within B		1.36	3.32			

Grains per ear head						
Seaweed ext 2ml/lit tillering	41.96	2	39.34	3	40.65	2
Seaweed ext 4ml/lit tillering	43.21	1	39.34	4	41.27	1
Seaweed ext 2ml/lit heading	38.86	5	40.92	2	39.89	3
Seaweed ext 4ml/lit heading	39.40	4	39.33	5	39.36	5
Seaweed ext 2ml/lit tillering & heading	40.86	3	38.17	6	39.51	4
Seaweed ext 4ml/lit tillering & heading	37.21	6	41.09	1	39.15	6
Mean	40.25		39.69		39.97	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.47	1.93		4.97	
Foliar application (B)	N.S.	1.16	2.83		7.11	
B within A	N.S.	1.64	4.01			
A within B		1.57	3.83			
Biomass, q/ha						
Seaweed ext 2ml/lit tillering	117.93	6	130.19	2	124.06	6
Seaweed ext 4ml/lit tillering	125.72	3	124.21	5	124.96	5
Seaweed ext 2ml/lit heading	127.15	2	123.46	6	125.31	4
Seaweed ext 4ml/lit heading	124.87	4	128.61	4	126.74	3
Seaweed ext 2ml/lit tillering & heading	124.68	5	130.30	1	127.49	2
Seaweed ext 4ml/lit tillering & heading	128.50	1	128.98	3	128.74	1
Mean	124.81		127.63		126.22	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	1.46	6.04		4.91	
Foliar application (B)	N.S.	1.75	4.27		3.40	
B within A	*	2.47	6.04			
A within B		2.69	6.56			
Date of Sowing:	20.11.2021		Date of Harvesting:	29.04.2022		

Table 6.12.3. North Western Plains Zone

Foliar application	SPL-2		Jammu		2021-22	
	Seed treatment with seaweed extract				Mean	Rk
	Without	Rk	With	Rk		
Yield, q/ha						
Seaweed ext 2ml/lit tillering	47.17	4	43.58	4	45.38	4
Seaweed ext 4ml/lit tillering	48.56	3	44.26	3	46.41	3
Seaweed ext 2ml/lit heading	44.77	6	41.84	6	43.31	6
Seaweed ext 4ml/lit heading	46.20	5	42.52	5	44.36	5
Seaweed ext 2ml/lit tillering & heading	49.65	2	45.13	2	47.39	2
Seaweed ext 4ml/lit tillering & heading	51.72	1	46.56	1	49.14	1
Mean	48.01		43.98		46.00	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.11	0.46		1.03	
Foliar application (B)	**	0.79	1.94		4.23	
B within A	N.S.	1.12	2.74			
A within B		1.03	2.52			
Earheads/sq.m						
Seaweed ext 2ml/lit tillering	421	2	364	5	392	4
Seaweed ext 4ml/lit tillering	422	1	378	4	400	2
Seaweed ext 2ml/lit heading	417	3	353	6	385	6
Seaweed ext 4ml/lit heading	403	6	381	2	392	5
Seaweed ext 2ml/lit tillering & heading	414	5	380	3	397	3
Seaweed ext 4ml/lit tillering & heading	415	4	402	1	408	1
Mean	415		376		396	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	*	3.34	13.81		3.59	
Foliar application (B)	N.S.	9.79	23.87		6.06	
B within A	N.S.	13.84	33.76			
A within B		13.07	31.88			

1000 grains weight, g						
Seaweed ext 2ml/lit tillering	37.51	4	36.92	4	37.21	4
Seaweed ext 4ml/lit tillering	38.23	3	37.59	3	37.91	3
Seaweed ext 2ml/lit heading	36.44	6	35.84	6	36.14	6
Seaweed ext 4ml/lit heading	37.20	5	36.52	5	36.86	5
Seaweed ext 2ml/lit tillering & heading	39.65	2	37.79	2	38.72	2
Seaweed ext 4ml/lit tillering & heading	40.06	1	38.76	1	39.41	1
Mean	38.18		37.24		37.71	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.29	1.19		3.24	
Foliar application (B)	**	0.57	1.38		3.68	
B within A	N.S.	0.80	1.95			
A within B		0.79	1.92			
Grains per ear head						
Seaweed ext 2ml/lit tillering	29.96	5	32.55	2	31.26	2
Seaweed ext 4ml/lit tillering	30.21	4	31.20	4	30.70	5
Seaweed ext 2ml/lit heading	29.60	6	33.24	1	31.42	1
Seaweed ext 4ml/lit heading	30.91	2	30.78	5	30.85	4
Seaweed ext 2ml/lit tillering & heading	30.27	3	31.73	3	31.00	3
Seaweed ext 4ml/lit tillering & heading	31.16	1	29.92	6	30.54	6
Mean	30.35		31.57		30.96	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	*	0.10	0.42		1.40	
Foliar application (B)	N.S.	1.13	2.75		8.92	
B within A	N.S.	1.60	3.89			
A within B		1.46	3.56			
Biomass, q/ha						
Seaweed ext 2ml/lit tillering	106.61	4	88.42	6	97.51	6
Seaweed ext 4ml/lit tillering	110.23	3	100.03	3	105.13	3
Seaweed ext 2ml/lit heading	102.08	6	94.97	5	98.53	5
Seaweed ext 4ml/lit heading	105.80	5	96.94	4	101.37	4
Seaweed ext 2ml/lit tillering & heading	114.20	2	103.34	2	108.77	2
Seaweed ext 4ml/lit tillering & heading	119.48	1	107.09	1	113.28	1
Mean	109.73		98.46		104.10	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.27	1.10		1.09	
Foliar application (B)	**	1.81	4.42		4.26	
B within A	N.S.	2.56	6.25			
A within B		2.35	5.74			
Date of Sowing:	17.11.2021		Date of Harvesting:	03.05.2022		

Table 6.13.1. North Eastern Plains Zone

Foliar application	SPL-2		Coochbehar		2021-22	
	Without	Rk	With	Rk	Mean	Rk
	Seed treatment with seaweed extract					
	Yield, q/ha					
Seaweed ext 2ml/lit tillering	63.23	2	60.33	5	61.7833333	4
Seaweed ext 4ml/lit tillering	65.57	1	61.63	4	63.60	1
Seaweed ext 2ml/lit heading	57.27	6	61.80	3	59.53	5
Seaweed ext 4ml/lit heading	58.20	3	59.93	6	59.07	6
Seaweed ext 2ml/lit tillering & heading	57.57	5	69.20	1	63.38	2
Seaweed ext 4ml/lit tillering & heading	58.07	4	67.53	2	62.80	3
Mean	59.98		63.41		61.69	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.91		3.76	6.26
Foliar application (B)	N.S.		2.69		6.56	10.68
B within A	N.S.		3.80		9.28	
A within B			3.59		8.75	

<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	338	4	336	6	337	5
Seaweed ext 4ml/lit tillering	353	1	348	3	351	3
Seaweed ext 2ml/lit heading	330	6	341	4	336	6
Seaweed ext 4ml/lit heading	340	3	340	5	340	4
Seaweed ext 2ml/lit tillering & heading	337	5	368	1	352	1
Seaweed ext 4ml/lit tillering & heading	340	2	363	2	352	2
Mean	340		349		345	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		9		39	11
Foliar application (B)	N.S.		14		34	10
B within A	N.S.		20		49	
A within B			20		50	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	45.41	1	44.62	3	45.01	1
Seaweed ext 4ml/lit tillering	44.42	2	43.63	5	44.03	2
Seaweed ext 2ml/lit heading	42.28	4	43.95	4	43.11	5
Seaweed ext 4ml/lit heading	41.61	5	42.85	6	42.23	6
Seaweed ext 2ml/lit tillering & heading	41.33	6	45.76	1	43.55	4
Seaweed ext 4ml/lit tillering & heading	42.30	3	45.61	2	43.96	3
Mean	42.89		44.40		43.65	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		1.84		7.61	17.92
Foliar application (B)	N.S.		2.77		6.75	15.54
B within A	N.S.		3.92		9.55	
A within B			4.02		9.81	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	41.83	2	40.97	6	41.40	3
Seaweed ext 4ml/lit tillering	41.90	1	41.17	4	41.53	1
Seaweed ext 2ml/lit heading	41.00	6	41.20	3	41.10	6
Seaweed ext 4ml/lit heading	41.33	4	41.03	5	41.18	5
Seaweed ext 2ml/lit tillering & heading	41.37	3	41.47	1	41.42	2
Seaweed ext 4ml/lit tillering & heading	41.20	5	41.33	2	41.27	4
Mean	41.44		41.19		41.32	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.04		0.18	0.45
Foliar application (B)	N.S.		0.14		0.35	0.84
B within A	*		0.20		0.49	
A within B			0.19		0.46	
Date of Sowing:	18.11.2021		Date of Harvesting:	25.03.2022		

**Table 6.13.2. North Eastern Plains Zone**

Foliar application	SPL-2		Ranchi		2021-22	
	Without	Rk	With	Rk	Mean	Rk
<b>Seed treatment with seaweed extract</b>						
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	40.82	2	39.72	6	40.27	6
Seaweed ext 4ml/lit tillering	40.24	6	40.59	5	40.42	5
Seaweed ext 2ml/lit heading	40.30	5	41.05	4	40.67	4
Seaweed ext 4ml/lit heading	41.42	1	41.65	3	41.53	2
Seaweed ext 2ml/lit tillering & heading	40.54	3	41.88	2	41.21	3
Seaweed ext 4ml/lit tillering & heading	40.31	4	43.04	1	41.67	1
Mean	40.60		41.32		40.96	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.43		1.79	4.50
Foliar application (B)	N.S.		0.44		1.08	2.65
B within A	N.S.		0.63		1.53	
A within B			0.72		1.75	

<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	411	5	444	3	428	4
Seaweed ext 4ml/lit tillering	425	1	449	2	437	2
Seaweed ext 2ml/lit heading	415	4	420	6	417	6
Seaweed ext 4ml/lit heading	408	6	440	5	424	5
Seaweed ext 2ml/lit tillering & heading	423	2	441	4	432	3
Seaweed ext 4ml/lit tillering & heading	420	3	458	1	439	1
Mean	417		442		429	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	*		3		12	3
Foliar application (B)	N.S.		15		37	9
B within A	N.S.		21		52	
A within B			20		48	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	22.11	2	19.56	5	20.83	3
Seaweed ext 4ml/lit tillering	21.07	5	19.54	6	20.31	6
Seaweed ext 2ml/lit heading	21.38	3	21.04	1	21.21	2
Seaweed ext 4ml/lit heading	22.28	1	20.26	3	21.27	1
Seaweed ext 2ml/lit tillering & heading	21.03	6	20.30	2	20.66	4
Seaweed ext 4ml/lit tillering & heading	21.17	4	19.97	4	20.57	5
Mean	21.51		20.11		20.81	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.80		3.29	16.26
Foliar application (B)	N.S.		0.93		2.26	10.90
B within A	N.S.		1.31		3.19	
A within B			1.44		3.51	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	45.30	6	45.86	6	45.58	6
Seaweed ext 4ml/lit tillering	45.37	5	46.49	5	45.93	5
Seaweed ext 2ml/lit heading	45.59	4	46.80	4	46.19	4
Seaweed ext 4ml/lit heading	45.91	1	47.09	2	46.50	2
Seaweed ext 2ml/lit tillering & heading	45.81	3	46.91	3	46.36	3
Seaweed ext 4ml/lit tillering & heading	45.85	2	47.40	1	46.63	1
Mean	45.64		46.76		46.20	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.93		3.84	8.54
Foliar application (B)	N.S.		0.91		2.22	4.83
B within A	N.S.		1.29		3.14	
A within B			1.50		3.66	
Date of Sowing:	19.11.2021		Date of Harvesting:	08.04.2022		

**Table 6.13.3. North Eastern Plains Zone**

Foliar application	SPL-2		Sabour		2021-22	
	Without	Rk	With	Rk	Mean	Rk
<b>Seed treatment with seaweed extract</b>						
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	44.92	5	39.88	4	42.40	6
Seaweed ext 4ml/lit tillering	47.67	2	41.71	3	44.69	1
Seaweed ext 2ml/lit heading	42.17	6	43.54	1	42.85	4
Seaweed ext 4ml/lit heading	46.29	4	39.42	5	42.85	4
Seaweed ext 2ml/lit tillering & heading	46.41	3	42.63	2	44.52	2
Seaweed ext 4ml/lit tillering & heading	48.13	1	38.50	6	43.31	3
Mean	45.93		40.94		43.44	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		1.46		6.02	14.23
Foliar application (B)	N.S.		2.36		5.76	13.32
B within A	N.S.		3.34		8.15	
A within B			3.38		8.24	

<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	329	3	328	3	328	1
Seaweed ext 4ml/lit tillering	323	4	330	2	327	3
Seaweed ext 2ml/lit heading	301	6	326	4	313	6
Seaweed ext 4ml/lit heading	334	1	317	6	326	4
Seaweed ext 2ml/lit tillering & heading	322	5	333	1	328	2
Seaweed ext 4ml/lit tillering & heading	330	2	321	5	326	5
Mean	323		326		325	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		9		39	12
Foliar application (B)	N.S.		12		30	9
B within A	N.S.		17		42	
A within B			18		45	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	32.08	5	28.13	6	30.10	6
Seaweed ext 4ml/lit tillering	34.52	3	31.46	3	32.99	2
Seaweed ext 2ml/lit heading	31.86	6	33.48	1	32.67	3
Seaweed ext 4ml/lit heading	32.35	4	30.67	4	31.51	5
Seaweed ext 2ml/lit tillering & heading	35.03	1	32.37	2	33.70	1
Seaweed ext 4ml/lit tillering & heading	34.79	2	29.51	5	32.15	4
Mean	33.44		30.93		32.19	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.69		2.84	9.06
Foliar application (B)	N.S.		2.69		6.56	20.45
B within A	N.S.		3.80		9.27	
A within B			3.54		8.63	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	42.57	5	43.26	1	42.92	1
Seaweed ext 4ml/lit tillering	42.92	2	40.17	5	41.54	5
Seaweed ext 2ml/lit heading	44.29	1	41.20	3	42.75	2
Seaweed ext 4ml/lit heading	42.92	2	41.20	3	42.06	3
Seaweed ext 2ml/lit tillering & heading	42.92	2	40.17	5	41.54	5
Seaweed ext 4ml/lit tillering & heading	42.57	6	41.20	2	41.89	4
Mean	43.03		41.20		42.12	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.52		2.13	5.20
Foliar application (B)	N.S.		1.52		3.72	8.86
B within A	N.S.		2.15		5.26	
A within B			2.03		4.96	
Date of Sowing:	04.12.2021		Date of Harvesting:		30.04.2022	

**Table 6.13.4. North Eastern Plains Zone**

Foliar application	SPL-2		Varanasi		2021-22	
	Without	Rk	With	Rk	Mean	Rk
<b>Seed treatment with seaweed extract</b>						
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	40.22	6	42.93	5	41.57	6
Seaweed ext 4ml/lit tillering	43.50	5	48.39	2	45.95	3
Seaweed ext 2ml/lit heading	45.46	2	48.83	1	47.15	1
Seaweed ext 4ml/lit heading	47.43	1	45.83	3	46.63	2
Seaweed ext 2ml/lit tillering & heading	44.66	4	43.93	4	44.30	4
Seaweed ext 4ml/lit tillering & heading	44.74	3	42.16	6	43.45	5
Mean	44.33		45.35		44.84	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.21		0.88	2.02
Foliar application (B)	**		0.33		0.80	1.80
B within A	**		0.47		1.13	
A within B			0.48		1.16	



<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	280	4	268	6	274	6
Seaweed ext 4ml/lit tillering	305	1	286	5	295	2
Seaweed ext 2ml/lit heading	262	6	313	1	287	4
Seaweed ext 4ml/lit heading	268	5	302	3	285	5
Seaweed ext 2ml/lit tillering & heading	297	3	287	4	292	3
Seaweed ext 4ml/lit tillering & heading	304	2	308	2	306	1
Mean	286		294		290	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		4		16	6
Foliar application (B)	*		6		13	5
B within A	**		8		19	
A within B			8		20	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	39.76	5	44.20	3	41.98	4
Seaweed ext 4ml/lit tillering	38.96	6	46.06	2	42.51	3
Seaweed ext 2ml/lit heading	46.70	2	46.32	1	46.51	1
Seaweed ext 4ml/lit heading	47.26	1	42.05	4	44.65	2
Seaweed ext 2ml/lit tillering & heading	41.06	3	41.99	5	41.53	5
Seaweed ext 4ml/lit tillering & heading	40.24	4	38.02	6	39.13	6
Mean	42.33		43.11		42.72	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.88		3.63	8.74
Foliar application (B)	*		0.83		2.03	4.78
B within A	**		1.18		2.87	
A within B			1.39		3.39	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	36.22	6	36.23	3	36.23	5
Seaweed ext 4ml/lit tillering	36.68	4	36.97	1	36.82	1
Seaweed ext 2ml/lit heading	37.20	2	34.06	6	35.63	6
Seaweed ext 4ml/lit heading	37.41	1	36.11	4	36.76	2
Seaweed ext 2ml/lit tillering & heading	36.72	3	36.55	2	36.64	3
Seaweed ext 4ml/lit tillering & heading	36.63	5	36.08	5	36.36	4
Mean	36.81		36.00		36.41	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.20		0.82	2.31
Foliar application (B)	N.S.		0.76		1.86	5.14
B within A	N.S.		1.08		2.64	
A within B			1.01		2.45	
Date of Sowing:	25.11.2021		Date of Harvesting:	06.04.2022		

**Table 6.14.1. Central Zone**

Foliar application	SPL-2		Dhanduka		2021-22	
	Without	Rk	With	Rk	Mean	Rk
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	27.18	4	26.70	6	26.94	6
Seaweed ext 4ml/lit tillering	27.89	2	30.44	3	29.17	3
Seaweed ext 2ml/lit heading	25.34	6	29.25	5	27.30	5
Seaweed ext 4ml/lit heading	26.87	5	30.44	3	28.66	4
Seaweed ext 2ml/lit tillering & heading	27.89	2	34.69	2	31.29	2
Seaweed ext 4ml/lit tillering & heading	31.63	1	35.03	1	33.33	1
Mean	27.80		31.09		29.45	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	*	0.51	2.11		7.37	
Foliar application (B)	**	0.78	1.91		6.50	
B within A	N.S.	1.11	2.70			
A within B		1.13	2.76			

<b>Earhead/sq.m.</b>						
Seaweed ext 2ml/lit tillering	273	5	273	5	273	5
Seaweed ext 4ml/lit tillering	270	6	269	6	270	6
Seaweed ext 2ml/lit heading	284	3	274	4	279	3
Seaweed ext 4ml/lit heading	283	4	275	3	279	3
Seaweed ext 2ml/lit tillering & heading	285	2	304	1	295	2
Seaweed ext 4ml/lit tillering & heading	298	1	303	2	301	1
Mean	282		283		283	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	4.18	17.28		6.28	
Foliar application (B)	**	5.30	12.93		4.59	
B within A	N.S.	7.49	18.28			
A within B		8.02	19.56			
<b>Grains /earhead</b>						
Seaweed ext 2ml/lit tillering	24.2	2	23.9	6	24.0	5
Seaweed ext 4ml/lit tillering	25.0	1	26.2	1	25.6	1
Seaweed ext 2ml/lit heading	22.4	6	24.2	5	23.3	6
Seaweed ext 4ml/lit heading	22.6	5	25.9	2	24.3	3
Seaweed ext 2ml/lit tillering & heading	23.4	4	24.9	4	24.1	4
Seaweed ext 4ml/lit tillering & heading	24.1	3	25.6	3	24.8	2
Mean	23.6		25.1		24.4	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.65	2.70		11.37	
Foliar application (B)	N.S.	0.57	1.39		5.71	
B within A	N.S.	0.80	1.96			
A within B		0.98	2.40			
<b>1000 grain wt, g</b>						
Seaweed ext 2ml/lit tillering	41.25	5	41.00	6	41.13	6
Seaweed ext 4ml/lit tillering	41.37	4	43.30	4	42.34	4
Seaweed ext 2ml/lit heading	39.78	6	43.99	3	41.89	5
Seaweed ext 4ml/lit heading	41.89	3	42.80	5	42.35	3
Seaweed ext 2ml/lit tillering & heading	41.95	2	45.91	1	43.93	2
Seaweed ext 4ml/lit tillering & heading	44.03	1	45.30	2	44.67	1
Mean	41.71		43.72		42.71	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	*	0.32	1.34		3.22	
Foliar application (B)	**	0.67	1.64		3.86	
B within A	N.S.	0.95	2.32			
A within B		0.93	2.26			
Date of Sowing:	08.11.2021		Date of Harvesting:	30.03.2022		

**Table 6.14.2. Central Zone**

Foliar application	SPL-2		Durgapura		2021-22	
	Without	Rk	With	Rk	Mean	Rk
<b>Seed treatment with seaweed extract</b>						
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	44.32	6	45.30	6	44.81	6
Seaweed ext 4ml/lit tillering	47.52	5	48.19	5	47.85	5
Seaweed ext 2ml/lit heading	50.08	4	52.74	4	51.41	4
Seaweed ext 4ml/lit heading	52.51	3	58.99	2	55.75	3
Seaweed ext 2ml/lit tillering & heading	54.13	2	58.83	3	56.48	2
Seaweed ext 4ml/lit tillering & heading	57.83	1	60.15	1	58.99	1
Mean	51.07		54.03		52.55	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	1.12	4.62		9.04	
Foliar application (B)	**	1.65	4.04		7.71	
B within A	N.S.	2.34	5.71			
A within B		2.41	5.88			

Earhead/sq.m.						
Seaweed ext 2ml/lit tillering	349	5	344	6	347	6
Seaweed ext 4ml/lit tillering	347	6	366	5	357	5
Seaweed ext 2ml/lit heading	378	4	387	4	383	4
Seaweed ext 4ml/lit heading	392	3	415	3	404	3
Seaweed ext 2ml/lit tillering & heading	394	2	422	2	408	2
Seaweed ext 4ml/lit tillering & heading	417	1	423	1	420	1
Mean	380		393		386	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	4.87	20.11		5.35	
Foliar application (B)	**	8.80	21.48		5.58	
B within A	N.S.	12.45	30.38			
A within B		12.37	30.17			
Grains /earhead						
Seaweed ext 2ml/lit tillering	35.3	6	34.7	4	35.0	6
Seaweed ext 4ml/lit tillering	36.6	3	34.3	5	35.4	5
Seaweed ext 2ml/lit heading	39.9	1	34.3	6	37.1	3
Seaweed ext 4ml/lit heading	35.9	5	39.6	1	37.8	1
Seaweed ext 2ml/lit tillering & heading	36.1	4	36.5	2	36.3	4
Seaweed ext 4ml/lit tillering & heading	39.1	2	36.2	3	37.6	2
Mean	37.2		35.9		36.5	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.41	1.68		4.73	
Foliar application (B)	N.S.	1.28	3.13		8.61	
B within A	N.S.	1.82	4.43			
A within B		1.71	4.17			
1000 grain wt, g						
Seaweed ext 2ml/lit tillering	36.13	4	37.95	5	37.04	4
Seaweed ext 4ml/lit tillering	37.85	2	38.40	3	38.13	2
Seaweed ext 2ml/lit heading	33.13	6	39.87	1	36.50	6
Seaweed ext 4ml/lit heading	37.39	3	35.73	6	36.56	5
Seaweed ext 2ml/lit tillering & heading	38.24	1	38.23	4	38.24	1
Seaweed ext 4ml/lit tillering & heading	35.72	5	39.33	2	37.53	3
Mean	36.41		38.25		37.33	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	**	0.07	0.30		0.83	
Foliar application (B)	N.S.	1.30	3.17		8.54	
B within A	N.S.	1.84	4.49			
A within B		1.68	4.10			
Date of Sowing:	18.11.2021		Date of Harvesting:	25.03.2022		

Table 6.14.3. Central Zone

Foliar application	SPL-2				Udaipur	2021-22
	Seed treatment with seaweed extract					
	Without	Rk	With	Rk	Mean	Rk
Yield, q/ha						
Seaweed ext 2ml/lit tillering	43.66	6	46.38	6	45.02	6
Seaweed ext 4ml/lit tillering	44.61	5	48.69	5	46.65	5
Seaweed ext 2ml/lit heading	45.56	4	48.96	4	47.26	4
Seaweed ext 4ml/lit heading	46.85	3	53.35	3	50.10	3
Seaweed ext 2ml/lit tillering & heading	51.58	2	56.20	2	53.89	2
Seaweed ext 4ml/lit tillering & heading	52.97	1	62.08	1	57.53	1
Mean	47.54		52.61		50.07	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	*	0.58	2.39		4.90	
Foliar application (B)	**	0.94	2.29		4.58	
B within A	N.S.	1.32	3.23			
A within B		1.34	3.27			

<b>Earhead/sq.m.</b>						
Seaweed ext 2ml/lit tillering	302	6	330	5	316	6
Seaweed ext 4ml/lit tillering	315	5	328	6	322	5
Seaweed ext 2ml/lit heading	317	3	340	3	328	4
Seaweed ext 4ml/lit heading	320	2	340	3	330	3
Seaweed ext 2ml/lit tillering & heading	342	1	348	2	345	1
Seaweed ext 4ml/lit tillering & heading	317	3	352	1	334	2
Mean	319		340		329	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	13.29	54.89		17.13	
Foliar application (B)	N.S.	7.23	17.64		5.38	
B within A	N.S.	10.23	24.95			
A within B		16.24	39.63			
<b>Grains /earhead</b>						
Seaweed ext 2ml/lit tillering	35.0	1	32.6	4	33.8	2
Seaweed ext 4ml/lit tillering	32.5	4	32.3	5	32.4	4
Seaweed ext 2ml/lit heading	32.3	5	31.1	6	31.7	6
Seaweed ext 4ml/lit heading	32.6	3	33.3	2	32.9	3
Seaweed ext 2ml/lit tillering & heading	31.7	6	32.8	3	32.2	5
Seaweed ext 4ml/lit tillering & heading	34.6	2	35.3	1	34.9	1
Mean	33.1		32.9		33.0	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	1.02	4.21		13.12	
Foliar application (B)	N.S.	0.96	2.34		7.10	
B within A	N.S.	1.35	3.30			
A within B		1.60	3.91			
<b>1000 grain wt, g</b>						
Seaweed ext 2ml/lit tillering	41.40	6	43.22	6	42.31	6
Seaweed ext 4ml/lit tillering	43.83	5	46.03	5	44.93	5
Seaweed ext 2ml/lit heading	44.62	4	46.40	4	45.51	4
Seaweed ext 4ml/lit heading	45.10	3	47.47	3	46.29	3
Seaweed ext 2ml/lit tillering & heading	47.83	2	49.58	2	48.71	2
Seaweed ext 4ml/lit tillering & heading	48.57	1	50.03	1	49.30	1
Mean	45.22		47.12		46.17	
	F. Test	SEm	CD (0.05)		CV (%)	
Seed treatment (A)	N.S.	0.83	3.42		7.62	
Foliar application (B)	**	0.50	1.21		2.63	
B within A	N.S.	0.70	1.71			
A within B		1.05	2.55			
Date of Sowing:	11.11.2021		Date of Harvesting:			

<b>Table 6.15.1. Peninsular Zone</b>	<b>SPL-2</b>		<b>Akola</b>		<b>2021-22</b>	
	Seed treatment with seaweed extract				Mean	Rk
Foliar application	Without	Rk	With	Rk		
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	34.03	5	31.75	6	32.89	6
Seaweed ext 4ml/lit tillering	37.69	1	41.07	1	39.38	1
Seaweed ext 2ml/lit heading	36.79	3	33.08	4	34.93	3
Seaweed ext 4ml/lit heading	35.99	4	32.30	5	34.14	4
Seaweed ext 2ml/lit tillering & heading	33.67	6	33.79	3	33.73	5
Seaweed ext 4ml/lit tillering & heading	36.84	2	34.98	2	35.91	2
Mean	35.83		34.50		35.16	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	*		0.12		0.51	1.50
Foliar application (B)	**		1.06		2.59	7.40
B within A	N.S.		1.50		3.66	
A within B			1.38		3.36	

		Earheads/sqm				
Seaweed ext 2ml/lit tillering	457	1	490	1	473	1
Seaweed ext 4ml/lit tillering	453	2	415	4	434	3
Seaweed ext 2ml/lit heading	443	4	397	5	420	5
Seaweed ext 4ml/lit heading	362	6	380	6	371	6
Seaweed ext 2ml/lit tillering & heading	402	5	465	2	433	4
Seaweed ext 4ml/lit tillering & heading	453	2	447	3	450	2
Mean	428		432		430	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		19.91		82.21	19.63
Foliar application (B)	*		17.56		42.85	10.00
B within A	N.S.		24.84		60.60	
A within B			30.18		73.61	
		Grains/Earhead				
Seaweed ext 2ml/lit tillering	20.85	6	18.02	6	19.43	6
Seaweed ext 4ml/lit tillering	25.24	2	29.94	1	27.59	1
Seaweed ext 2ml/lit heading	24.61	3	24.63	2	24.62	2
Seaweed ext 4ml/lit heading	27.53	1	21.67	4	24.60	3
Seaweed ext 2ml/lit tillering & heading	23.20	4	19.20	5	21.20	5
Seaweed ext 4ml/lit tillering & heading	21.39	5	22.99	3	22.19	4
Mean	23.80		22.74		23.27	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		1.05		4.33	19.13
Foliar application (B)	**		1.07		2.60	11.22
B within A	*		1.51		3.68	
A within B			1.73		4.22	
		1000 Grains Weight, g				
Seaweed ext 2ml/lit tillering	36.40	3	36.55	3	36.48	3
Seaweed ext 4ml/lit tillering	32.97	6	33.70	6	33.33	6
Seaweed ext 2ml/lit heading	33.90	5	34.37	4	34.13	5
Seaweed ext 4ml/lit heading	36.23	4	39.27	1	37.75	1
Seaweed ext 2ml/lit tillering & heading	36.43	2	38.33	2	37.38	2
Seaweed ext 4ml/lit tillering & heading	38.23	1	34.07	5	36.15	4
Mean	35.69		36.05		35.87	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	*		0.04		0.15	0.43
Foliar application (B)	**		0.14		0.33	0.93
B within A	**		0.19		0.47	
A within B			0.18		0.44	
Date of Sowing:	15.12.2021		Date of Harvesting:	08.04.2022		

Foliar application	SPL-2		Dharwad		2021-22	
	Without	Rk	With	Rk	Mean	Rk
Seed treatment with seaweed extract						
Yield, q/ha						
Seaweed ext 2ml/lit tillering	37.29	4	38.51	6	37.90	6
Seaweed ext 4ml/lit tillering	36.48	5	41.16	3	38.82	3
Seaweed ext 2ml/lit heading	41.28	1	42.44	1	41.86	1
Seaweed ext 4ml/lit heading	38.95	2	42.06	2	40.51	2
Seaweed ext 2ml/lit tillering & heading	37.86	3	39.73	5	38.80	4
Seaweed ext 4ml/lit tillering & heading	36.42	6	39.81	4	38.12	5
Mean	38.05		40.62		39.33	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		1.13		4.65	12.14
Foliar application (B)	N.S.		1.32		3.21	8.20
B within A	N.S.		1.86		4.54	
A within B			2.04		4.97	

<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	217	4	210	5	213	5
Seaweed ext 4ml/lit tillering	211	6	224	3	218	4
Seaweed ext 2ml/lit heading	238	1	263	1	251	1
Seaweed ext 4ml/lit heading	223	2	225	2	224	2
Seaweed ext 2ml/lit tillering & heading	216	5	222	4	219	3
Seaweed ext 4ml/lit tillering & heading	218	3	197	6	208	6
Mean	220		224		222	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		5.51		22.76	10.53
Foliar application (B)	**		7.19		17.54	7.93
B within A	N.S.		10.17		24.80	
A within B			10.79		26.33	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	46.14	4	46.19	4	46.17	4
Seaweed ext 4ml/lit tillering	46.81	1	46.65	2	46.73	2
Seaweed ext 2ml/lit heading	44.86	5	39.55	6	42.21	6
Seaweed ext 4ml/lit heading	46.43	3	46.43	3	46.43	3
Seaweed ext 2ml/lit tillering & heading	46.49	2	45.20	5	45.85	5
Seaweed ext 4ml/lit tillering & heading	44.47	6	51.11	1	47.79	1
Mean	45.87		45.86		45.86	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.55		2.28	5.10
Foliar application (B)	N.S.		2.67		6.51	14.26
B within A	N.S.		3.78		9.21	
A within B			3.49		8.52	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	37.47	5	39.83	3	38.65	5
Seaweed ext 4ml/lit tillering	37.27	6	39.40	6	38.33	6
Seaweed ext 2ml/lit heading	39.33	1	41.04	1	40.19	1
Seaweed ext 4ml/lit heading	38.08	2	40.30	2	39.19	2
Seaweed ext 2ml/lit tillering & heading	38.04	3	39.77	4	38.91	3
Seaweed ext 4ml/lit tillering & heading	37.87	4	39.60	5	38.74	4
Mean	38.01		39.99		39.00	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		1.01		4.18	11.01
Foliar application (B)	N.S.		0.79		1.93	4.98
B within A	N.S.		1.12		2.73	
A within B			1.44		3.51	
Date of Sowing:	14.11.2021		Date of Harvesting:	20.03.2022		

**Table 6.15.3. Peninsular Zone**

Foliar application	<b>SPL-2</b>		<b>Niphad</b>		<b>2021-22</b>	
	Without	Rk	With	Rk	Mean	Rk
<b>Seed treatment with seaweed extract</b>						
<b>Yield, q/ha</b>						
Seaweed ext 2ml/lit tillering	44.74	6	50.15	6	47.44	6
Seaweed ext 4ml/lit tillering	45.89	5	51.81	5	48.85	5
Seaweed ext 2ml/lit heading	47.20	4	52.86	4	50.03	4
Seaweed ext 4ml/lit heading	48.92	3	54.77	3	51.84	3
Seaweed ext 2ml/lit tillering & heading	50.08	2	55.32	2	52.70	2
Seaweed ext 4ml/lit tillering & heading	51.49	1	57.88	1	54.68	1
Mean	48.05		53.80		50.92	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	*		0.66		2.72	5.49
Foliar application (B)	**		0.88		2.15	4.24
B within A	N.S.		1.25		3.04	
A within B			1.31		3.21	

<b>Earheads/sqm</b>						
Seaweed ext 2ml/lit tillering	326	6	373	6	350	6
Seaweed ext 4ml/lit tillering	335	5	385	5	360	5
Seaweed ext 2ml/lit heading	344	4	393	4	369	4
Seaweed ext 4ml/lit heading	357	3	407	3	382	3
Seaweed ext 2ml/lit tillering & heading	362	2	412	2	387	2
Seaweed ext 4ml/lit tillering & heading	376	1	431	1	403	1
Mean	350		400		375	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	**		1.64		6.79	1.86
Foliar application (B)	**		6.79		16.56	4.43
B within A	N.S.		9.60		23.42	
A within B			8.92		21.75	
<b>Grains/Earhead</b>						
Seaweed ext 2ml/lit tillering	31.45	1	29.23	1	30.34	1
Seaweed ext 4ml/lit tillering	29.34	4	28.11	4	28.72	4
Seaweed ext 2ml/lit heading	31.32	2	28.05	5	29.68	3
Seaweed ext 4ml/lit heading	28.64	6	28.30	3	28.47	5
Seaweed ext 2ml/lit tillering & heading	30.97	3	28.93	2	29.95	2
Seaweed ext 4ml/lit tillering & heading	28.87	5	27.68	6	28.27	6
Mean	30.10		28.38		29.24	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	N.S.		0.46		1.88	6.61
Foliar application (B)	**		0.41		0.99	3.40
B within A	N.S.		0.57		1.40	
A within B			0.69		1.69	
<b>1000 Grains Weight, g</b>						
Seaweed ext 2ml/lit tillering	43.63	6	45.99	6	44.81	6
Seaweed ext 4ml/lit tillering	46.76	3	47.90	3	47.33	3
Seaweed ext 2ml/lit heading	43.86	5	47.95	2	45.90	4
Seaweed ext 4ml/lit heading	47.89	1	47.55	4	47.72	2
Seaweed ext 2ml/lit tillering & heading	44.78	4	46.48	5	45.63	5
Seaweed ext 4ml/lit tillering & heading	47.42	2	48.63	1	48.02	1
Mean	45.72		47.42		46.57	
	F. Test		SEm		CD (0.05)	CV (%)
Seed treatment (A)	*		0.12		0.51	1.12
Foliar application (B)	**		0.64		1.56	3.36
B within A	N.S.		0.90		2.20	
A within B			0.83		2.03	
Date of Sowing:	27.11.2021		Date of Harvesting:		12.03.2022	

Table 6.17.1. North Western Plains Zone		SPL-3		Delhi		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	49.33	337	34.75	42.14	86.67	80.12
Rec N + One nano urea spray tillering	54.87	556	36.73	26.89	126.00	116.50
Rec N + Two nano urea spray tillering & Jointing	53.23	525	38.51	26.34	124.23	110.60
Rec N + Two 5% urea spray tillering & Jointing	52.20	530	39.70	24.79	119.17	112.47
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	50.20	511	37.70	26.02	120.33	107.60
75% Rec N + One nano urea spray tillering	46.47	441	35.60	29.58	118.20	101.70
75% Rec N + Two nano urea spray tillering & Jointing	45.60	427	36.31	29.40	112.20	98.60
75% Rec N + Two 5% urea spray tillering & Jointing	49.27	443	36.69	30.32	120.13	102.80
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	44.73	419	36.00	29.67	112.40	98.70
50% Rec N + One nano urea spray tillering	39.00	394	35.91	27.53	107.20	89.16
50% Rec N + Two nano urea spray tillering & Jointing	44.00	413	35.50	30.03	108.67	93.70
50% Rec N + Two 5% urea spray tillering & Jointing	47.33	443	35.72	29.94	117.53	101.67
Absolute Control (No nitrogen application)	39.33	396	35.70	27.84	106.67	98.46
Mean	47.35	449	36.52	29.27	113.80	100.93
CD (0.05)	3.25	10.14	0.50	2.16	0.46	0.24
CV (%)	4.92	1.62	0.97	5.27	0.29	0.17
Date of Sowing:	19.11.2021		Date of Harvesting:			

Table 6.17.2. North Western Plains Zone		SPL-3		Gurdaspur		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	48.63	339	37.00	38.71	136.03	96.13
Rec N + One nano urea spray tillering	50.30	343	37.50	39.06	141.23	97.00
Rec N + Two nano urea spray tillering & Jointing	55.60	358	39.50	39.35	148.00	98.93
Rec N + Two 5% urea spray tillering & Jointing	51.90	347	38.00	39.40	142.13	97.00
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	45.10	326	36.30	38.12	129.87	93.87
75% Rec N + One nano urea spray tillering	47.03	331	36.90	38.49	132.83	95.83
75% Rec N + Two nano urea spray tillering & Jointing	52.60	349	38.80	38.81	143.10	98.03
75% Rec N + Two 5% urea spray tillering & Jointing	48.90	335	37.40	39.02	135.87	96.13
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	41.80	313	35.10	38.15	123.67	93.77
50% Rec N + One nano urea spray tillering	43.40	319	36.20	37.61	126.03	94.00
50% Rec N + Two nano urea spray tillering & Jointing	48.40	330	36.60	40.07	134.70	95.87
50% Rec N + Two 5% urea spray tillering & Jointing	45.33	323	35.50	39.54	129.33	94.07
Absolute Control (No nitrogen application)	37.17	293	32.97	38.52	110.37	92.00
Mean	47.40	331	36.75	38.83	133.32	95.59
CD (0.05)	2.57	8.61	1.04	2.25	4.47	1.46
CV (%)	3.88	1.86	2.02	4.16	2.40	1.09
Date of Sowing:	09.11.2021		Date of Harvesting:			

Table 6.17.3. North Western Plains Zone		SPL-3		Gwalior		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	46.22	351	42.93	30.81	129.25	93.80
Rec N + One nano urea spray tillering	50.51	376	45.30	29.64	144.56	96.53
Rec N + Two nano urea spray tillering & Jointing	52.52	393	45.82	29.21	142.86	98.00
Rec N + Two 5% urea spray tillering & Jointing	43.82	362	44.90	26.98	125.85	95.47
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	43.82	341	42.93	29.97	137.76	90.27
75% Rec N + One nano urea spray tillering	50.28	369	45.19	30.22	153.06	95.93
75% Rec N + Two nano urea spray tillering & Jointing	51.28	385	45.36	29.41	146.26	96.93
75% Rec N + Two 5% urea spray tillering & Jointing	49.20	355	45.13	30.87	153.06	94.93
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	41.00	331	42.93	28.96	136.05	86.80
50% Rec N + One nano urea spray tillering	47.98	350	44.58	30.86	174.49	91.47
50% Rec N + Two nano urea spray tillering & Jointing	49.56	359	44.63	30.97	141.16	94.20
50% Rec N + Two 5% urea spray tillering & Jointing	46.80	342	44.23	31.00	132.65	91.00
Absolute Control (No nitrogen application)	31.90	291	43.82	25.11	115.65	76.60
Mean	46.53	354	44.44	29.54	140.97	92.46
CD (0.05)	4.74	16.06	1.66	4.15	9.18	3.25
CV (%)	7.29	3.25	2.67	10.07	4.66	2.51
Date of Sowing:	15.11.2021		Date of Harvesting:			



Table 6.17.4. North Western Plains Zone		SPL-3		Hisar		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	54.25	425	39.14	32.63	141.84	107.89
Rec N + One nano urea spray tillering	55.03	435	38.30	33.03	144.56	106.67
Rec N + Two nano urea spray tillering & Jointing	56.19	443	38.03	33.38	146.26	109.11
Rec N + Two 5% urea spray tillering & Jointing	55.95	440	38.39	33.13	146.26	110.33
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	47.93	382	39.28	32.11	127.89	102.44
75% Rec N + One nano urea spray tillering	49.39	389	39.72	32.17	130.95	104.78
75% Rec N + Two nano urea spray tillering & Jointing	50.95	397	39.25	32.88	134.35	105.67
75% Rec N + Two 5% urea spray tillering & Jointing	49.12	389	38.97	32.41	130.27	105.00
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	41.90	335	40.30	31.16	115.65	96.00
50% Rec N + One nano urea spray tillering	43.16	350	39.96	30.93	119.05	97.33
50% Rec N + Two nano urea spray tillering & Jointing	44.52	366	40.11	30.56	123.81	98.56
50% Rec N + Two 5% urea spray tillering & Jointing	44.15	362	40.28	30.36	121.77	100.00
Absolute Control (No nitrogen application)	34.32	285	41.11	29.41	98.64	86.78
Mean	48.22	384	39.45	31.86	129.33	102.35
CD (0.05)	3.84	27.88	1.87	3.93	9.99	7.37
CV (%)	5.70	5.19	3.39	8.82	5.53	5.16
Date of Sowing:	11.11.2021		Date of Harvesting:			

Table 6.17.5. North Western Plains Zone		SPL-3		Jammu		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	44.27	406	38.29	28.60	99.15	84.90
Rec N + One nano urea spray tillering	45.33	431	38.07	27.70	101.34	90.97
Rec N + Two nano urea spray tillering & Jointing	45.60	439	38.84	26.75	106.57	92.67
Rec N + Two 5% urea spray tillering & Jointing	47.73	455	38.93	27.15	107.53	94.90
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	41.67	381	37.47	29.29	91.90	81.17
75% Rec N + One nano urea spray tillering	42.87	404	37.71	28.25	93.98	88.10
75% Rec N + Two nano urea spray tillering & Jointing	43.37	430	37.66	26.94	94.09	90.73
75% Rec N + Two 5% urea spray tillering & Jointing	46.63	451	37.82	27.47	98.34	87.77
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	39.40	372	36.80	28.81	87.95	79.07
50% Rec N + One nano urea spray tillering	40.51	365	36.84	30.21	92.29	81.80
50% Rec N + Two nano urea spray tillering & Jointing	41.43	394	36.99	28.56	93.22	83.43
50% Rec N + Two 5% urea spray tillering & Jointing	43.63	432	37.15	27.20	94.68	85.67
Absolute Control (No nitrogen application)	27.87	248	35.33	31.95	74.20	73.87
Mean	42.33	401	37.53	28.38	95.02	85.77
CD (0.05)	4.53	44.53	2.47	3.91	11.72	9.72
CV (%)	7.66	7.96	4.72	9.86	8.83	8.11
Date of Sowing:	15.11.2021		Date of Harvesting:			

Table 6.17.6. North Western Plains Zone		SPL-3		Karnal		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	55.10	386	34.52	41.39	143.47	96.98
Rec N + One nano urea spray tillering	53.72	393	33.06	41.58	146.87	103.29
Rec N + Two nano urea spray tillering & Jointing	54.08	368	33.93	43.38	145.48	102.58
Rec N + Two 5% urea spray tillering & Jointing	55.24	382	32.36	44.85	145.17	104.81
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	47.76	338	33.95	41.71	133.06	101.31
75% Rec N + One nano urea spray tillering	44.97	328	34.78	39.58	126.33	97.67
75% Rec N + Two nano urea spray tillering & Jointing	45.78	348	34.79	37.82	117.11	101.52
75% Rec N + Two 5% urea spray tillering & Jointing	48.40	348	34.66	40.15	139.22	100.14
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	46.12	312	35.49	41.75	117.48	91.89
50% Rec N + One nano urea spray tillering	46.09	331	34.95	39.96	114.05	96.07
50% Rec N + Two nano urea spray tillering & Jointing	45.72	335	33.90	40.53	113.03	94.98
50% Rec N + Two 5% urea spray tillering & Jointing	46.36	326	34.85	40.81	122.86	98.14
Absolute Control (No nitrogen application)	20.71	230	34.27	26.29	53.98	76.61
Mean	46.93	340	34.27	39.99	124.47	97.39
CD (0.05)	2.19	29.24	1.65	3.01	15.09	7.18
CV (%)	3.34	6.15	3.46	5.39	8.68	5.28
Date of Sowing:	02.12.2021		Date of Harvesting:			

Table 6.17.7. North Western Plains Zone		SPL-3		Ludhiana		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	41.10	241	34.61	49.39	113.33	94.13
Rec N + One nano urea spray tillering	43.20	242	35.10	51.03	115.33	96.07
Rec N + Two nano urea spray tillering & Jointing	43.17	242	35.73	50.18	114.33	98.73
Rec N + Two 5% urea spray tillering & Jointing	46.63	242	35.59	54.48	114.67	94.40
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	36.30	234	33.93	45.83	108.00	95.47
75% Rec N + One nano urea spray tillering	36.87	235	34.05	46.16	108.67	96.33
75% Rec N + Two nano urea spray tillering & Jointing	36.97	234	34.42	45.76	109.00	97.67
75% Rec N + Two 5% urea spray tillering & Jointing	38.73	238	34.48	47.28	109.33	99.87
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	34.20	227	34.37	43.94	97.33	94.80
50% Rec N + One nano urea spray tillering	34.77	225	34.05	45.38	100.33	96.53
50% Rec N + Two nano urea spray tillering & Jointing	35.77	225	34.19	46.46	100.67	93.93
50% Rec N + Two 5% urea spray tillering & Jointing	36.07	226	34.26	46.66	111.00	96.80
Absolute Control (No nitrogen application)	22.87	183	33.63	37.44	58.67	86.40
Mean	37.43	230	34.49	46.92	104.67	95.47
SEm	1.45	5.53	0.73	2.34	3.55	2.41
CD (0.05)	3.51	13.37	1.78	5.66	8.59	5.84
CV (%)	6.71	4.16	3.69	8.63	5.87	4.38
Date of Sowing:	10.11.2021	Date of Harvesting:				

Table 6.17.8. North Western Plains Zone		SPL-3		Pantnagar		2021-22
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	41.03	467	34.21	25.74	144.90	102.87
Rec N + One nano urea spray tillering	41.14	468	32.62	26.97	146.60	101.07
Rec N + Two nano urea spray tillering & Jointing	43.76	473	34.94	26.88	148.98	101.87
Rec N + Two 5% urea spray tillering & Jointing	42.14	488	30.92	28.42	153.74	102.07
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	45.30	427	32.13	34.28	151.70	104.80
75% Rec N + One nano urea spray tillering	45.84	448	34.62	29.49	153.74	104.07
75% Rec N + Two nano urea spray tillering & Jointing	51.24	450	33.26	35.27	159.86	102.73
75% Rec N + Two 5% urea spray tillering & Jointing	42.47	451	35.48	26.89	151.70	101.40
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	45.75	376	38.97	32.24	151.70	97.93
50% Rec N + One nano urea spray tillering	47.60	428	31.87	34.99	150.34	106.13
50% Rec N + Two nano urea spray tillering & Jointing	47.53	471	34.47	29.73	146.26	105.20
50% Rec N + Two 5% urea spray tillering & Jointing	45.37	451	32.83	30.85	153.06	100.00
Absolute Control (No nitrogen application)	21.60	259	30.07	27.69	70.91	69.40
Mean	43.14	435	33.57	29.96	144.88	99.96
SEm	1.74	21.31	2.23	2.85	4.87	2.28
CD (0.05)	4.21	51.57	5.40	6.90	11.79	5.51
CV (%)	6.98	8.49		16.50	5.82	3.94
Date of Sowing:	23.11.2021	Date of Harvesting:				

Table 6.18.1. North Eastern Plains Zone		SPL-3		Burdwan		2021-22
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha	
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	257	44.35	32.85	37.35	89.59	
Rec N + One nano urea spray tillering	263	44.82	31.98	37.52	90.31	
Rec N + Two nano urea spray tillering & Jointing	263	45.18	32.93	39.15	94.69	
Rec N + Two 5% urea spray tillering & Jointing	268	45.40	32.91	39.97	96.94	
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	242	42.51	31.29	32.08	75.95	
75% Rec N + One nano urea spray tillering	250	43.09	30.86	33.10	78.77	
75% Rec N + Two nano urea spray tillering & Jointing	250	43.66	31.63	34.46	82.55	
75% Rec N + Two 5% urea spray tillering & Jointing	255	43.76	32.09	35.78	86.39	
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	225	40.89	27.31	25.03	59.25	
50% Rec N + One nano urea spray tillering	233	41.86	27.16	26.47	63.13	
50% Rec N + Two nano urea spray tillering & Jointing	240	42.60	27.30	27.86	66.53	
50% Rec N + Two 5% urea spray tillering & Jointing	233	42.27	27.56	27.18	65.00	
Absolute Control (No nitrogen application)	198	36.86	17.63	12.93	30.61	
Mean	244	42.86	29.50	31.45	75.36	
CD (0.05)	25	2.16	2.93	2.79	6.50	
CV (%)	7	3.61	7.12	6.35	6.18	
Date of Sowing :	24.11.2021	Date of Harvesting:		15.03.2022		

<b>Table 6.18.2. North Eastern Plains Zone</b>		<b>SPL-3</b>		<b>Coochbehar</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	295	41.03	42.00	50.83	127.63		
Rec N + One nano urea spray tillering	308	41.57	42.67	54.57	137.00		
Rec N + Two nano urea spray tillering & Jointing	309	41.83	45.67	58.97	147.03		
Rec N + Two 5% urea spray tillering & Jointing	313	41.90	46.33	60.80	155.33		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	276	41.00	43.67	49.37	123.20		
75% Rec N + One nano urea spray tillering	291	41.33	43.67	52.37	130.10		
75% Rec N + Two nano urea spray tillering & Jointing	294	41.70	46.33	56.60	144.03		
75% Rec N + Two 5% urea spray tillering & Jointing	304	41.43	44.67	56.17	143.50		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	256	40.80	44.00	45.80	115.63		
50% Rec N + One nano urea spray tillering	252	39.67	43.00	43.03	108.67		
50% Rec N + Two nano urea spray tillering & Jointing	259	39.63	43.00	44.10	111.83		
50% Rec N + Two 5% urea spray tillering & Jointing	274	41.23	43.67	49.20	125.40		
Absolute Control (No nitrogen application)	214	37.47	34.67	28.03	75.47		
Mean	280	40.82	43.33	49.99	126.53		
CD (0.05)	29	0.61	3.88	7.54	15.17		
CV (%)	7	1.08	6.40	10.80	8.58		
Date of Sowing :	23.11.2021	Date of Harvesting:		25.03.2022			

<b>Table 6.18.3. North Eastern Plains Zone</b>		<b>SPL-3</b>		<b>Ranchi</b>		<b>2021-22</b>	
Treatments	Earheads/sq m	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass , q/ha		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	360	45.33	31.19	50.42	112.53		
Rec N + One nano urea spray tillering	363	45.60	31.8	52.00	116.09		
Rec N + Two nano urea spray tillering & Jointing	367	46.70	32.1	54.86	122.65		
Rec N + Two 5% urea spray tillering & Jointing	355	44.80	32.1	50.95	113.67		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	340	44.40	33.0	48.58	108.55		
75% Rec N + One nano urea spray tillering	350	44.53	32.6	50.46	112.80		
75% Rec N + Two nano urea spray tillering & Jointing	373	44.40	30.4	50.23	112.20		
75% Rec N + Two 5% urea spray tillering & Jointing	325	43.47	33.4	46.74	104.44		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	338	44.27	26.3	39.29	87.62		
50% Rec N + One nano urea spray tillering	303	44.83	32.1	43.32	96.66		
50% Rec N + Two nano urea spray tillering & Jointing	338	44.33	29.6	44.18	98.68		
50% Rec N + Two 5% urea spray tillering & Jointing	318	44.20	28.7	39.35	87.99		
Absolute Control (No nitrogen application)	285	39.13	17.2	18.98	42.41		
Mean	340	44.31	30.0	45.34	101.25		
CD (0.05)	45	1.95	5.48	4.01	9.06		
CV (%)	10	3.16	13.06	6.34	6.41		
Date of Sowing :	19.11.2021	Date of Harvesting:		10.04.2022			

<b>Table 6.18.4. North Eastern Plains Zone</b>		<b>SPL-3</b>		<b>Sabour</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	332	40.00	34.28	45.27	102.92		
Rec N + One nano urea spray tillering	361	39.33	32.54	45.25	103.22		
Rec N + Two nano urea spray tillering & Jointing	366	41.00	31.61	46.13	101.26		
Rec N + Two 5% urea spray tillering & Jointing	374	40.00	31.80	47.25	117.25		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	324	40.00	33.28	41.16	93.81		
75% Rec N + One nano urea spray tillering	330	42.00	30.65	42.30	99.84		
75% Rec N + Two nano urea spray tillering & Jointing	324	39.00	35.06	44.67	102.10		
75% Rec N + Two 5% urea spray tillering & Jointing	317	41.00	35.66	44.83	102.71		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	341	41.00	27.92	38.54	89.62		
50% Rec N + One nano urea spray tillering	332	39.67	30.12	39.25	91.05		
50% Rec N + Two nano urea spray tillering & Jointing	318	40.00	29.46	37.36	88.01		
50% Rec N + Two 5% urea spray tillering & Jointing	284	40.33	34.64	37.78	92.34		
Absolute Control (No nitrogen application)	257	36.33	33.74	30.88	81.61		
Mean	328	39.97	32.37	41.59	97.37		
CD (0.05)	55	6.47	10.81	8.79	19.04		
CV (%)	12	11.59	23.90	15.13	13.99		
Date of Sowing :	19.11.2021	Date of Harvesting:		13.99			

Table 6.18.5. North Eastern Plains Zone	SPL-3		Sabour		2021-22	
	Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	332	40.00	34.28	45.27	102.92	
Rec N + One nano urea spray tillering	361	39.33	32.54	45.25	103.22	
Rec N + Two nano urea spray tillering & Jointing	366	41.00	31.61	46.13	101.26	
Rec N + Two 5% urea spray tillering & Jointing	374	40.00	31.80	47.25	117.25	
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	324	40.00	33.28	41.16	93.81	
75% Rec N + One nano urea spray tillering	330	42.00	30.65	42.30	99.84	
75% Rec N + Two nano urea spray tillering & Jointing	324	39.00	35.06	44.67	102.10	
75% Rec N + Two 5% urea spray tillering & Jointing	317	41.00	35.66	44.83	102.71	
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	341	41.00	27.92	38.54	89.62	
50% Rec N + One nano urea spray tillering	332	39.67	30.12	39.25	91.05	
50% Rec N + Two nano urea spray tillering & Jointing	318	40.00	29.46	37.36	88.01	
50% Rec N + Two 5% urea spray tillering & Jointing	284	40.33	34.64	37.78	92.34	
Absolute Control (No nitrogen application)	257	36.33	33.74	30.88	81.61	
Mean	328	39.97	32.37	41.59	97.37	
CD (0.05)	55	6.47	10.81	8.79	19.04	
CV (%)	12	11.59	23.90	15.13	13.99	
Date of Sowing :	19.11.2021	Date of Harvesting:			20.04.2022	

Table 6.18.6. North Eastern Plains Zone	SPL-3		Varanasi		2021-22	
	Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	219	38.65	49.05	41.08	94.18	
Rec N + One nano urea spray tillering	207	38.21	53.12	41.59	58.82	
Rec N + Two nano urea spray tillering & Jointing	232	38.71	46.95	42.02	67.66	
Rec N + Two 5% urea spray tillering & Jointing	203	38.54	53.16	41.41	68.34	
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	199	37.33	42.37	31.34	61.20	
75% Rec N + One nano urea spray tillering	202	38.40	41.64	32.35	58.48	
75% Rec N + Two nano urea spray tillering & Jointing	230	37.21	40.44	34.46	55.76	
75% Rec N + Two 5% urea spray tillering & Jointing	159	39.11	52.08	32.43	58.48	
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	201	34.15	41.73	27.39	55.08	
50% Rec N + One nano urea spray tillering	187	34.88	46.73	29.71	48.62	
50% Rec N + Two nano urea spray tillering & Jointing	236	36.96	32.31	28.01	47.26	
50% Rec N + Two 5% urea spray tillering & Jointing	192	38.51	39.95	29.58	58.14	
Absolute Control (No nitrogen application)	180	38.05	27.39	18.71	38.76	
Mean	204	37.59	43.61	33.08	59.29	
CD (0.05)	21	3.68	7.94	1.32	10.58	
CV (%)	8	7.01	13.03	2.86	12.77	
Date of Sowing :	19.11.2021	Date of Harvesting:			20.04.2022	

Table 6.19.1. Central Zone	SPL-3			Bilaspur		2021-22	
	Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	336	26.0	41.33	36.05	85.1	76.71	
Rec N + One nano urea spray tillering	342	26.9	41.89	38.45	88.1	78.11	
Rec N + Two nano urea spray tillering & Jointing	347	27.0	42.24	39.61	91.0	78.90	
Rec N + Two 5% urea spray tillering & Jointing	356	27.7	43.32	42.76	93.0	84.15	
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	324	24.5	40.51	32.18	82.2	74.57	
75% Rec N + One nano urea spray tillering	331	25.9	41.28	35.24	84.0	75.39	
75% Rec N + Two nano urea spray tillering & Jointing	341	26.2	41.57	37.00	87.3	77.18	
75% Rec N + Two 5% urea spray tillering & Jointing	345	27.0	42.19	39.27	89.2	78.52	
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	309	23.1	39.51	28.16	74.5	70.51	
50% Rec N + One nano urea spray tillering	318	24.4	39.92	30.86	79.1	72.62	
50% Rec N + Two nano urea spray tillering & Jointing	324	24.4	40.37	31.97	82.0	73.42	
50% Rec N + Two 5% urea spray tillering & Jointing	328	25.9	40.60	34.43	83.1	74.16	
Absolute Control (No nitrogen application)	288	19.4	38.55	21.58	68.1	64.32	
CD (0.05)	3.99	2.48	2.24	2.05	2.17	3.13	
Date of Sowing	17.11.2021	Date of Harvesting			05.04.2022		

<b>Table 6.19.2. Central Zone</b>		<b>SPL-3</b>			<b>Durgapura</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	374	37.9	37.49	53.16	90.1	121.02
Rec N + One nano urea spray tillering	382	37.4	38.61	54.90	93.0	125.46
Rec N + Two nano urea spray tillering & Jointing	385	37.4	38.49	55.33	95.4	127.74
Rec N + Two 5% urea spray tillering & Jointing	380	37.2	38.33	54.13	91.4	122.53
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	350	35.8	39.80	49.92	86.3	114.97
75% Rec N + One nano urea spray tillering	362	36.1	40.40	52.63	89.5	120.23
75% Rec N + Two nano urea spray tillering & Jointing	378	35.7	39.93	53.76	91.2	123.06
75% Rec N + Two 5% urea spray tillering & Jointing	360	36.1	39.77	51.63	88.1	117.15
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	318	31.5	38.93	38.98	81.3	88.79
50% Rec N + One nano urea spray tillering	341	35.6	40.13	48.74	84.3	110.38
50% Rec N + Two nano urea spray tillering & Jointing	345	35.3	40.60	49.34	86.2	110.86
50% Rec N + Two 5% urea spray tillering & Jointing	337	38.0	37.13	47.49	82.9	103.85
Absolute Control (No nitrogen application)	269	32.9	39.47	34.70	78.1	78.84
CD (0.05)	23.25	3.21	2.48	4.32	8.10	10.66
Date of Sowing	18.11.2021			Date of Harvesting		22.3.2022

<b>Table 6.19.3. Central Zone</b>		<b>SPL-3</b>			<b>Indore</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	320	34.0	51.53	56.17	99.5	140.57
Rec N + One nano urea spray tillering	331	31.8	51.97	54.63	99.0	141.73
Rec N + Two nano urea spray tillering & Jointing	285	38.0	51.50	55.53	98.2	133.17
Rec N + Two 5% urea spray tillering & Jointing	311	33.2	51.20	52.77	98.8	136.20
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	301	33.2	52.10	51.77	97.1	133.17
75% Rec N + One nano urea spray tillering	292	32.7	52.97	50.40	97.5	127.03
75% Rec N + Two nano urea spray tillering & Jointing	288	33.0	52.90	50.23	96.8	132.40
75% Rec N + Two 5% urea spray tillering & Jointing	307	32.8	52.00	52.23	97.7	131.27
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	285	29.8	54.33	46.10	91.4	106.70
50% Rec N + One nano urea spray tillering	255	33.9	52.07	44.90	96.8	114.10
50% Rec N + Two nano urea spray tillering & Jointing	257	34.3	53.13	46.57	92.7	121.20
50% Rec N + Two 5% urea spray tillering & Jointing	284	31.4	53.43	47.53	95.0	119.83
Absolute Control (No nitrogen application)	209	23.8	54.97	27.30	81.7	70.30
CD (0.05)	25.23	3.76	1.09	4.21	2.54	11.68
Date of Sowing	12.11.2021			Date of Harvesting		01.04.2022

<b>Table 6.19.4. Central Zone</b>		<b>SPL-3</b>			<b>Jabalpur</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	382	31.2	42.03	50.07	89.0	94.97
Rec N + One nano urea spray tillering	399	31.3	44.40	55.28	94.1	96.01
Rec N + Two nano urea spray tillering & Jointing	423	31.1	44.92	59.02	96.4	100.17
Rec N + Two 5% urea spray tillering & Jointing	408	32.5	44.00	58.22	95.3	89.85
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	376	30.4	42.03	48.06	86.9	89.90
75% Rec N + One nano urea spray tillering	383	28.8	43.95	48.35	88.7	92.34
75% Rec N + Two nano urea spray tillering & Jointing	391	30.4	43.79	51.65	91.7	91.34
75% Rec N + Two 5% urea spray tillering & Jointing	399	29.8	44.23	52.63	93.1	87.02
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	362	27.5	42.03	41.80	81.6	88.17
50% Rec N + One nano urea spray tillering	367	27.8	43.68	44.52	82.2	88.38
50% Rec N + Two nano urea spray tillering & Jointing	377	28.6	43.73	47.11	85.9	88.93
50% Rec N + Two 5% urea spray tillering & Jointing	375	27.6	43.33	44.63	84.5	79.27
Absolute Control (No nitrogen application)	308	23.2	42.92	30.58	78.6	68.32
CD (0.05)	17.52	3.11	1.73	4.33	6.35	6.17
Date of Sowing	16.11.2021			Date of Harvesting		04.02.2022

Table 6.19.5. Central Zone	SPL-3			Junagadh		2021-22
	Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	457	26.5	46.80	56.70	73.9	110.71
Rec N + One nano urea spray tillering	443	27.4	46.53	56.50	72.2	107.07
Rec N + Two nano urea spray tillering & Jointing	443	28.7	46.53	59.01	73.8	111.97
Rec N + Two 5% urea spray tillering & Jointing	457	28.7	46.93	61.67	76.4	111.02
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	428	29.6	45.00	56.63	70.5	109.86
75% Rec N + One nano urea spray tillering	428	30.0	45.40	58.28	69.5	114.28
75% Rec N + Two nano urea spray tillering & Jointing	440	28.5	45.53	56.87	71.4	108.03
75% Rec N + Two 5% urea spray tillering & Jointing	412	31.2	45.63	58.43	71.9	108.39
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	363	34.5	44.40	55.48	70.2	106.26
50% Rec N + One nano urea spray tillering	351	36.5	43.93	56.29	69.6	107.56
50% Rec N + Two nano urea spray tillering & Jointing	358	34.6	44.73	55.48	70.2	105.58
50% Rec N + Two 5% urea spray tillering & Jointing	380	33.2	45.47	57.35	72.1	106.29
Absolute Control (No nitrogen application)	335	31.2	41.37	43.18	64.5	88.64
CD (0.05)	27.55	2.64	0.66	3.57	1.71	5.65
Date of Sowing	18.11.2021			Date of Harvesting		03.09.2022

Table 6.19.6. Central Zone	SPL-3			Powarkheda		2021-22
	Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	442	24.0	46.13	48.81	92.7	59.69
Rec N + One nano urea spray tillering	452	23.0	47.39	49.23	93.7	69.81
Rec N + Two nano urea spray tillering & Jointing	460	21.9	50.51	50.82	100.0	79.90
Rec N + Two 5% urea spray tillering & Jointing	455	22.0	49.69	49.63	95.7	59.73
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	418	26.5	41.17	45.44	88.0	74.42
75% Rec N + One nano urea spray tillering	422	26.1	42.55	46.60	89.3	78.23
75% Rec N + Two nano urea spray tillering & Jointing	435	25.1	45.32	48.30	92.0	77.21
75% Rec N + Two 5% urea spray tillering & Jointing	428	25.2	44.71	48.16	91.3	63.40
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	403	32.8	32.42	42.86	83.3	85.37
50% Rec N + One nano urea spray tillering	397	31.4	35.21	43.66	85.7	80.75
50% Rec N + Two nano urea spray tillering & Jointing	398	28.4	40.79	45.68	87.3	72.01
50% Rec N + Two 5% urea spray tillering & Jointing	378	30.8	38.79	45.07	87.0	83.84
Absolute Control (No nitrogen application)	367	21.9	31.03	24.50	79.3	89.18
CD (0.05)	46.55	4.63	3.46	5.68	5.80	12.45
Date of Sowing	25.11.2021			Date of Harvesting		10.04.2022

Table 6.19.7. Central Zone	SPL-3			Vijapur		2021-22
	Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	448	23.5	51.62	54.04	85.5	134.13
Rec N + One nano urea spray tillering	464	23.9	52.16	57.42	85.3	136.92
Rec N + Two nano urea spray tillering & Jointing	505	22.5	51.87	58.79	87.2	139.29
Rec N + Two 5% urea spray tillering & Jointing	443	23.4	51.38	52.75	85.1	131.46
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	477	19.4	51.47	47.25	84.7	126.33
75% Rec N + One nano urea spray tillering	394	25.1	51.08	49.71	82.7	125.79
75% Rec N + Two nano urea spray tillering & Jointing	440	22.6	51.53	51.00	82.2	123.75
75% Rec N + Two 5% urea spray tillering & Jointing	427	21.9	52.79	49.17	84.5	126.96
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	349	20.6	51.48	37.00	80.5	99.29
50% Rec N + One nano urea spray tillering	357	20.4	50.31	36.58	79.1	100.63
50% Rec N + Two nano urea spray tillering & Jointing	376	19.4	48.78	35.13	79.1	96.13
50% Rec N + Two 5% urea spray tillering & Jointing	400	21.1	50.41	42.63	79.5	109.00
Absolute Control (No nitrogen application)	308	9.2	51.80	14.63	66.6	46.71
CD (0.05)	60.11	2.99	4.30	5.96	3.95	12.86
Date of Sowing	04.11.2021			Date of Harvesting		03.03.2022

<b>Table 6.20.1. Peninsular Zone</b>		<b>SPL-3</b>		<b>Akola</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Plant height, cm		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	278	38.00	32.90	34.61	82.00		
Rec N + One nano urea spray tillering	308	43.23	26.17	34.79	83.50		
Rec N + Two nano urea spray tillering & Jointing	308	43.50	29.01	38.80	80.50		
Rec N + Two 5% urea spray tillering & Jointing	313	45.20	26.24	37.00	76.50		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	290	44.20	24.34	31.12	81.50		
75% Rec N + One nano urea spray tillering	303	40.57	25.15	30.85	74.50		
75% Rec N + Two nano urea spray tillering & Jointing	280	39.80	31.66	35.20	75.00		
75% Rec N + Two 5% urea spray tillering & Jointing	285	43.50	28.27	35.05	75.50		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	278	42.53	23.17	27.15	85.50		
50% Rec N + One nano urea spray tillering	283	41.43	25.63	29.93	80.00		
50% Rec N + Two nano urea spray tillering & Jointing	313	45.31	25.58	35.82	91.50		
50% Rec N + Two 5% urea spray tillering & Jointing	283	42.57	28.16	33.15	76.00		
Absolute Control (No nitrogen application)	225	45.77	21.11	21.00	86.00		
Mean	288	42.74	26.72	32.65	80.62		
CD (0.05)	35.81	0.90	3.90	1.35	6.46		
CV (%)	8.90	1.51	10.43	2.96	5.74		
Date of Sowing :	14.12.2021	Date of Harvesting:		08.04.2022			

<b>Table 6.20.2. Peninsular Zone</b>		<b>SPL-3</b>		<b>Dharwad</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Plant height, cm		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	289	36.33	32.02	33.29	74.27		
Rec N + One nano urea spray tillering	307	35.95	30.50	32.26	79.07		
Rec N + Two nano urea spray tillering & Jointing	318	34.29	36.13	37.72	78.17		
Rec N + Two 5% urea spray tillering & Jointing	312	35.14	35.03	37.80	72.80		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	271	36.27	33.58	32.68	70.80		
75% Rec N + One nano urea spray tillering	296	33.95	37.52	37.48	74.20		
75% Rec N + Two nano urea spray tillering & Jointing	312	37.05	35.43	38.45	79.80		
75% Rec N + Two 5% urea spray tillering & Jointing	318	39.15	32.15	39.86	80.87		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	267	36.97	34.17	33.09	69.53		
50% Rec N + One nano urea spray tillering	300	36.01	32.04	34.30	75.00		
50% Rec N + Two nano urea spray tillering & Jointing	285	35.46	34.84	34.76	75.17		
50% Rec N + Two 5% urea spray tillering & Jointing	306	34.36	33.87	35.42	74.20		
Absolute Control (No nitrogen application)	262	31.49	32.07	26.54	66.10		
Mean	296	35.57	33.80	34.90	74.61		
CD (0.05)	41.80	5.40	8.73	5.35	10.81		
CV (%)	10.12	10.86	18.49	10.98	10.37		
Date of Sowing :	15.11.2021	Date of Harvesting:		20.03.2022			

<b>Table 6.20.3. Peninsular Zone</b>		<b>SPL-3</b>		<b>Niphad</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Plant height, cm		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	400	44.30	28.04	49.50	85.20		
Rec N + One nano urea spray tillering	416	44.80	28.71	53.33	86.33		
Rec N + Two nano urea spray tillering & Jointing	449	45.10	28.29	57.33	87.53		
Rec N + Two 5% urea spray tillering & Jointing	414	44.70	28.02	51.33	85.33		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	360	42.90	27.53	42.60	84.07		
75% Rec N + One nano urea spray tillering	393	43.20	26.80	45.51	84.73		
75% Rec N + Two nano urea spray tillering & Jointing	397	43.80	26.55	46.23	85.23		
75% Rec N + Two 5% urea spray tillering & Jointing	366	43.20	28.97	44.86	84.87		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	320	42.80	28.74	39.03	82.20		
50% Rec N + One nano urea spray tillering	336	43.30	29.46	42.00	82.67		
50% Rec N + Two nano urea spray tillering & Jointing	366	43.50	26.94	42.54	82.87		
50% Rec N + Two 5% urea spray tillering & Jointing	331	43.10	29.65	41.93	82.73		
Absolute Control (No nitrogen application)	301	41.30	22.06	27.37	73.73		
Mean	373	43.54	27.67	44.89	83.65		
CD (0.05)	37.15	1.58	6.62	8.47	3.89		
CV (%)	7.13	2.59	17.12	13.51	3.33		
Date of Sowing :	27.11.2021	Date of Harvesting:	12.03.2022				

<b>Table 6.20.4. Peninsular Zone</b>		<b>SPL-3</b>		<b>Pune</b>		<b>2021-22</b>	
Treatments	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Plant height, cm		
Rec N (1/3rd b, 1/3rd CRI, 1/3rd J)+ two water spray	378	46.23	36.43	63.05	86.67		
Rec N + One nano urea spray tillering	353	48.10	35.68	60.07	86.33		
Rec N + Two nano urea spray tillering & Jointing	438	47.20	30.04	61.26	83.67		
Rec N + Two 5% urea spray tillering & Jointing	338	47.30	39.72	63.50	85.67		
75% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	408	47.07	32.24	61.33	86.67		
75% Rec N + One nano urea spray tillering	420	47.43	33.12	65.26	83.33		
75% Rec N + Two nano urea spray tillering & Jointing	420	46.43	32.92	64.15	85.67		
75% Rec N + Two 5% urea spray tillering & Jointing	448	48.33	29.94	63.65	82.00		
50% Rec N (1/3rd basal, 2/3rd CRI-Rec N)	343	48.33	34.82	57.17	83.33		
50% Rec N + One nano urea spray tillering	280	48.23	41.25	55.09	84.00		
50% Rec N + Two nano urea spray tillering & Jointing	348	47.40	36.32	59.59	83.00		
50% Rec N + Two 5% urea spray tillering & Jointing	375	48.13	32.54	58.18	87.67		
Absolute Control (No nitrogen application)	340	48.13	30.26	49.41	79.33		
Mean	376	47.56	34.25	60.13	84.41		
CD (0.05)	74	1.51	4.95	6.93	5.00		
CV (%)	14	2.28	10.34	8.25	4.24		
Date of Sowing :	353	Date of Harvesting:	12.03.2022				



<b>Table 6.22.1. North Western Plains Zone</b>		<b>SPL-4</b>		<b>Gwalior</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	42.54	290	39.51	37.27	111.21	94.20
Two Nano Urea Spray at tillering & Jointing	47.73	314	39.70	38.32	118.91	96.53
Rec N (1/3rd basal, 2/3rd CRI)	45.40	294	40.17	38.47	116.54	94.27
Rec N + One Nano Urea Spray at tillering	50.12	312	41.68	38.54	124.25	98.20
Rec N + Two Nano Urea Spray at tillering & Jointing	54.76	369	39.49	37.73	129.33	99.53
Rec N + One Urea (5%) Spray at tillering	45.55	306	39.62	37.58	114.92	95.73
Rec N + Two Urea (5%) Spray at tillering & Jointing	46.24	308	40.67	37.01	117.51	94.13
Rec N + One Urea (5%) + Nano Urea spray at tillering	52.07	339	39.09	39.37	125.91	97.80
Absolute control (No Nitrogen)	38.03	288	38.44	34.36	101.16	93.93
Mean	46.94	313	39.82	37.63	117.75	96.04
SEm	1.74	7.32	0.61	1.53	4.96	0.88
CD (0.05)	4.30	18.06	1.51	3.78	12.24	2.17
CV (%)	6.42	4.04	2.66	7.05	7.29	1.59
Date of Sowing:	15.11.2021		Date of Harvesting:			

<b>Table 6.22.2. North Western Plains Zone</b>		<b>SPL-4</b>		<b>Hisar</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	34.84	332	32.25	32.67	101.09	91.67
Two Nano Urea Spray at tillering & Jointing	36.97	340	32.68	33.42	105.19	95.44
Rec N (1/3rd basal, 2/3rd CRI)	42.27	403	35.06	29.97	111.48	101.00
Rec N + One Nano Urea Spray at tillering	43.22	408	35.25	30.07	113.93	103.00
Rec N + Two Nano Urea Spray at tillering & Jointing	44.54	412	35.53	30.43	116.67	105.78
Rec N + One Urea (5%) Spray at tillering	43.03	405	34.98	30.52	113.66	103.44
Rec N + Two Urea (5%) Spray at tillering & Jointing	44.34	413	35.40	30.37	116.67	104.33
Rec N + One Urea (5%) + Nano Urea spray at tillering	44.13	408	35.46	30.78	116.39	105.00
Absolute control (No Nitrogen)	27.84	283	31.88	31.14	83.33	83.33
Mean	40.13	378	34.28	31.04	108.71	99.22
SEm	1.54	17.46	0.75	1.79	3.92	2.67
CD (0.05)	3.80	43.12	1.84	4.41	9.68	6.59
CV (%)	6.64	8.00	3.78	9.96	6.25	4.66
Date of Sowing:	11.11.2021		Date of Harvesting:			

<b>Table 6.22.3. North Western Plains Zone</b>		<b>SPL-4</b>		<b>Karnal</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	35.83	435	28.39	29.45	106.17	106.27
Two Nano Urea Spray at tillering & Jointing	32.48	365	28.11	31.69	98.61	106.60
Rec N (1/3rd basal, 2/3rd CRI)	34.79	397	28.26	31.25	106.44	105.60
Rec N + One Nano Urea Spray at tillering	35.29	382	28.73	32.45	111.50	106.13
Rec N + Two Nano Urea Spray at tillering & Jointing	32.63	467	26.46	27.53	103.83	105.60
Rec N + One Urea (5%) Spray at tillering	33.76	437	27.33	28.38	101.39	105.27
Rec N + Two Urea (5%) Spray at tillering & Jointing	34.48	487	27.48	25.94	106.91	106.80
Rec N + One Urea (5%) + Nano Urea spray at tillering	34.67	422	27.47	30.51	104.53	105.53
Absolute control (No Nitrogen)	35.35	452	28.88	27.16	111.89	105.87
Mean	34.37	427	27.90	29.37	105.70	105.96
SEm	1.34	28.66	0.77	2.73	2.56	0.92
CD (0.05)	3.32	70.77	1.90	6.74	6.32	2.27
CV (%)	6.77	11.63	4.77	16.09	4.19	1.51
Date of Sowing:	16.11.2021		Date of Harvesting:			

<b>Table 6.22.4. North Western Plains Zone</b>		<b>SPL-4</b>		<b>Pantnagar</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ Earhead	Biomass, q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	45.01	348	47.45	27.26	139.19	101.00
Two Nano Urea Spray at tillering & Jointing	45.33	354	44.19	29.10	138.84	97.60
Rec N (1/3rd basal, 2/3rd CRI)	59.47	404	47.04	31.68	161.08	103.27
Rec N + One Nano Urea Spray at tillering	59.42	353	40.51	42.14	150.92	100.87
Rec N + Two Nano Urea Spray at tillering & Jointing	58.87	378	45.44	34.64	154.18	98.93
Rec N + One Urea (5%) Spray at tillering	54.29	353	38.90	40.00	169.23	99.93
Rec N + Two Urea (5%) Spray at tillering & Jointing	55.86	390	41.03	36.66	164.84	101.80
Rec N + One Urea (5%) + Nano Urea spray at tillering	57.57	399	44.15	32.94	158.24	101.87
Absolute control (No Nitrogen)	34.27	246	43.46	32.32	108.46	98.00
Mean	52.23	358	43.57	34.08	149.44	100.36
SEm	1.52	24.42	2.10	3.09	7.93	2.45
CD (0.05)	3.76	60.31	5.20	7.63	19.58	6.06
CV (%)	5.05	11.80	8.37	15.70	9.19	4.23
Date of Sowing:	10.11.2021		Date of Harvesting:			

Table 6.23.1. North Eastern Plains Zone	SPL-4		Ayodhya		2021-22	
	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass , q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	382	36.30	15.71	21.80	49.36	85.00
Two Nano Urea Spray at tillering & Jointing	383	36.60	15.74	22.04	49.87	86.33
Rec N (1/3rd basal, 2/3rd CRI)	488	39.80	23.52	45.67	103.38	107.67
Rec N + One Nano Urea Spray at tillering	488	39.10	24.01	45.84	104.25	104.33
Rec N + Two Nano Urea Spray at tillering & Jointing	489	39.23	24.00	46.01	105.10	104.33
Rec N + One Urea (5%) Spray at tillering	497	39.40	23.60	46.18	104.76	105.00
Rec N + Two Urea (5%) Spray at tillering & Jointing	499	40.03	23.39	46.69	106.46	109.00
Rec N + One Urea (5%) + Nano Urea spray at tillering	496	39.53	23.55	46.18	105.09	108.00
Absolute control (No Nitrogen)	381	35.97	15.32	21.02	47.47	67.33
Mean	456	38.44	20.98	37.94	86.19	97.44
CD (0.05)	5	0.41	0.91	1.33	2.33	2.64
CV (%)	1	0.61	2.50	2.02	1.56	1.57
Date of Sowing:	12.11. 2021			Date of Harvesting:		15.03.2022

Table 6.23.2. North Eastern Plains Zone	SPL-4		Burdwan		2021-22	
	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass , q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	188	37.95	16.66	11.77	27.04	76.33
Two Nano Urea Spray at tillering & Jointing	198	40.90	16.47	13.30	30.68	78.33
Rec N (1/3rd basal, 2/3rd CRI)	223	41.06	18.76	17.18	40.03	81.33
Rec N + One Nano Urea Spray at tillering	222	41.48	19.80	18.16	42.55	82.67
Rec N + Two Nano Urea Spray at tillering & Jointing	233	42.31	20.06	19.73	46.16	85.33
Rec N + One Urea (5%) Spray at tillering	223	41.99	20.14	18.84	44.39	83.00
Rec N + Two Urea (5%) Spray at tillering & Jointing	237	42.40	20.56	20.51	47.99	88.33
Rec N + One Urea (5%) + Nano Urea Spray at tillering	228	42.29	19.82	19.12	44.76	83.00
Absolute control (No Nitrogen)	183	36.72	16.16	10.85	24.93	75.33
Mean	215	40.79	18.69	16.61	38.73	81.52
CD (0.05)	25	1.57	3.03	2.13	4.92	6.63
CV (%)	7	2.22	9.37	7.40	7.35	4.70
Date of Sowing:	04.11. 2021			Date of Harvesting:		09.03.2022

Table 6.23.3. North Eastern Plains Zone	SPL-4		Kanpur		2021-22	
	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass , q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	345	44.32	16.66	25.46	92.57	79.43
Two Nano Urea Spray at tillering & Jointing	369	43.13	18.93	30.09	114.56	91.22
Rec N (1/3rd basal, 2/3rd CRI)	365	41.84	22.38	34.02	135.12	93.33
Rec N + One Nano Urea Spray at tillering	363	42.43	23.46	36.11	135.34	91.84
Rec N + Two Nano Urea Spray at tillering & Jointing	395	41.37	24.47	40.04	122.32	101.95
Rec N + One Urea (5%) Spray at tillering	384	43.36	23.09	38.42	123.81	104.21
Rec N + Two Urea (5%) Spray at tillering & Jointing	368	44.53	24.87	40.71	133.09	104.07
Rec N + One Urea (5%) + Nano Urea spray at tillering	374	42.31	29.04	45.97	133.96	103.37
Absolute control (No Nitrogen)	277	38.46	26.09	27.77	98.44	75.17
Mean	360	42.42	23.22	35.40	121.02	93.84
CD (0.05)	18	0.77	3.45	4.84	8.40	3.06
CV (%)	3	1.05	8.59	7.89	4.01	1.89
Date of Sowing:	18.11. 2021			Date of Harvesting:		01.05.2022

Table 6.23.4. North Eastern Plains Zone	SPL-4		RPCAU PUSA		2021-22	
	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass , q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	220	33.00	37.14	26.767	58.30	81.87
Two Nano Urea Spray at tillering & Jointing	234	35.02	43.07	35.08	76.41	81.07
Rec N (1/3rd basal, 2/3rd CRI)	219	33.07	36.99	26.69	58.12	88.93
Rec N + One Nano Urea Spray at tillering	224	35.03	44.04	34.54	74.47	91.20
Rec N + Two Nano Urea Spray at tillering & Jointing	242	35.01	42.90	36.33	77.53	90.60
Rec N + One Urea (5%) Spray at tillering	242	36.02	49.22	42.77	90.33	92.53
Rec N + Two Urea (5%) Spray at tillering & Jointing	240	37.00	52.24	45.96	104.14	89.33
Rec N + One Urea (5%) + Nano Urea spray at tillering	256	36.02	48.79	44.84	100.33	91.47
Absolute control (No Nitrogen)	212	32.00	33.81	22.74	53.02	80.60
Mean	232	34.68	43.13	35.08	76.96	87.51
CD (0.05)	14	2.98	7.00	3.11	4.34	5.71
CV (%)	4	4.97	9.37	5.12	3.25	3.77
Date of Sowing:	04.12. 2021			Date of Harvesting:		04.04.2022

Table 6.23.5. North Eastern Plains Zone	SPL-4		Shillongani		2021-22	
	Earheads/ sqm	1000 GW, g	Grains/ Earhead	Yield, q/ha	Biomass, q/ha	Plant Ht., cm
One Nano Urea Spray at tillering	137	45.26	68.70	41.50	64.79	89.20
Two Nano Urea Spray at tillering & Jointing	145	45.43	68.93	42.99	75.18	89.20
Rec N (1/3rd basal, 2/3rd CRI)	235	44.10	42.51	43.93	71.28	92.00
Rec N + One Nano Urea Spray at tillering	225	45.59	43.48	44.33	67.77	92.07
Rec N + Two Nano Urea Spray at tillering & Jointing	251	42.16	43.20	45.60	76.29	90.07
Rec N + One Urea (5%) Spray at tillering	230	43.81	43.87	44.16	79.35	92.33
Rec N + Two Urea (5%) Spray at tillering & Jointing	245	48.42	38.45	45.47	82.26	92.40
Rec N + One Urea (5%) + Nano Urea spray at tillering	241	46.70	41.08	46.18	88.39	91.87
Absolute control (No Nitrogen)	109	40.56	51.81	22.83	53.84	89.60
Mean	202	44.67	49.11	41.89	73.24	87.67
CD (0.05)	25	3.17	13.08	2.43	5.31	29.76
CV (%)	7	4.10	15.38	3.35	4.19	19.61
Date of Sowing:	12.11. 2021			Date of Harvesting:	04.03.2022	

Table 6.24.1. Central Zone	SPL-4			Indore		2021-22
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
One Nano Urea Spray at tillering	177	27.0	43.63	20.73	92.1	60.43
Two Nano Urea Spray at tillering & Jointing	193	27.6	42.73	22.70	93.7	64.93
Rec N (1/3rd basal, 2/3rd CRI)	286	34.9	40.53	40.37	105.0	118.17
Rec N + One Nano Urea Spray at tillering	282	33.8	40.20	38.40	104.9	114.07
Rec N + Two Nano Urea Spray at tillering & Jointing	276	36.8	40.77	41.37	106.0	123.27
Rec N + One Urea (5%) Spray at tillering	303	32.5	40.57	39.93	104.9	124.07
Rec N + Two Urea (5%) Spray at tillering & Jointing	305	33.7	40.03	41.07	104.3	123.37
Rec N + One Urea (5%) + Nano Urea spray at tillering	282	37.8	40.03	42.60	105.7	124.60
Absolute control (No Nitrogen)	184	28.6	42.80	22.43	93.7	63.63
CD (0.05)	19.20	3.29	1.04	2.71	1.52	7.45
Date of Sowing:	12.11.2021		Date of Harvesting	01.04.2022		

Table 6.24.2. Central Zone	SPL-4			Udaipur		2021-22
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
One Nano Urea Spray at tillering	362	28.1	38.76	39.27	88.7	117.30
Two Nano Urea Spray at tillering & Jointing	380	29.7	39.43	44.44	88.6	127.50
Rec N (1/3rd basal, 2/3rd CRI)	395	24.5	45.70	44.23	88.7	125.80
Rec N + One Nano Urea Spray at tillering	403	26.2	48.53	51.17	90.3	144.47
Rec N + Two Nano Urea Spray at tillering & Jointing	415	26.0	49.00	52.46	91.5	146.20
Rec N + One Urea (5%) Spray at tillering	408	24.6	48.31	48.45	91.0	135.99
Rec N + Two Urea (5%) Spray at tillering & Jointing	410	24.9	48.23	48.99	93.2	142.80
Rec N + One Urea (5%) + Nano Urea spray at tillering	397	24.5	47.39	45.90	88.7	134.27
Absolute control (No Nitrogen)	340	22.0	42.37	31.62	74.9	98.57
CD (0.05)	26.43	3.49	1.75	4.21	3.61	8.03
Date of Sowing:	12.11.2021		Date of Harvesting	Date of Harvest:	24.03.2022	

Table 6.24.3. Central Zone	SPL-4			Vijapur		2021-22
	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant height, cm	Biomass, q/ha
One Nano Urea Spray at tillering	313	10.8	47.37	15.92	65.3	46.58
Two Nano Urea Spray at tillering & Jointing	294	10.3	48.91	14.60	66.1	44.92
Rec N (1/3rd basal, 2/3rd CRI)	353	23.3	48.26	39.52	77.0	96.00
Rec N + One Nano Urea Spray at tillering	341	23.1	49.46	38.59	74.7	92.08
Rec N + Two Nano Urea Spray at tillering & Jointing	387	22.4	51.24	44.40	76.5	107.29
Rec N + One Urea (5%) Spray at tillering	379	22.3	50.02	42.46	78.4	105.58
Rec N + Two Urea (5%) Spray at tillering & Jointing	381	23.6	48.16	43.13	76.1	106.34
Rec N + One Urea (5%) + Nano Urea spray at tillering	366	22.3	51.92	42.04	78.8	105.08
Absolute control (No Nitrogen)	308	10.5	45.54	14.56	66.3	47.71
CD (0.05)	50.19	3.71	4.54	5.32	3.96	12.83
Date of Sowing:	04.11.2021		Date of Harvesting	03.03.2022		

Table 6.27.1. Peninsular Zone	SPL-6		Dharwad		2021-22
	Tillage				Mean
Residue management	CT-Flat bed	ZT-Flat bed	CT-Broad bed	ZT-Broad bed	
<b>Yield, q/ha</b>					
Control	31.65	34.57	24.38	27.47	29.52
Wheat residue @3 t/ha	31.70	34.84	36.01	33.10	33.91
Soybean residue @3 t/ha	35.64	32.67	39.27	33.96	35.39
Soybean + wheat residue @3 t/ha	36.47	37.23	39.48	35.58	37.19
Mean	33.86	34.83	34.79	32.53	34.00
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.81	2.23	8.28	
Residue management (B)	**	1.06	2.57	10.84	
B within A	N.S.	2.13	5.15		
A within B		2.01	4.87		
<b>Earheads/sqm</b>					
Control	318.67	349.33	308.00	300.00	319.00
Wheat residue @3 t/ha	326.67	338.33	327.33	327.00	329.83
Soybean residue @3 t/ha	337.00	329.00	309.00	309.00	321.00
Soybean + wheat residue @3 t/ha	341.67	362.00	353.33	345.33	350.58
Mean	331.00	344.67	324.42	320.33	330.10
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	*	4.09	11.24	4.29	
Residue management (B)	N.S.	10.74	25.99	11.27	
B within A	N.S.	21.48	51.98		
A within B		19.05	46.09		
<b>Grains/Earhead</b>					
Control	29.87	30.19	24.18	27.38	27.91
Wheat residue @3 t/ha	28.50	27.74	30.55	29.98	29.19
Soybean residue @3 t/ha	32.60	28.45	34.30	31.81	31.79
Soybean + wheat residue @3 t/ha	29.60	27.79	28.83	27.97	28.55
Mean	30.14	28.54	29.46	29.28	29.36
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	1.01	2.77	11.87	
Residue management (B)	N.S.	1.51	3.65	17.81	
B within A	N.S.	3.02	7.31		
A within B		2.80	6.78		
<b>1000 Grains Weight, g</b>					
Control	33.70	33.85	32.62	33.47	33.41
Wheat residue @3 t/ha	34.75	37.67	36.45	34.45	35.83
Soybean residue @3 t/ha	33.42	34.83	37.33	34.75	35.08
Soybean + wheat residue @3 t/ha	36.10	37.12	38.97	37.37	37.39
Mean	34.49	35.87	36.34	35.01	35.43
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.86	2.36	8.41	
Residue management (B)	*	0.80	1.94	7.83	
B within A	N.S.	1.60	3.88		
A within B		1.63	3.95		

<b>Plant Height, cm</b>					
Control	70.53	68.63	68.80	68.47	69.11
Wheat residue @3 t/ha	75.73	77.67	77.53	77.97	77.23
Soybean residue @3 t/ha	76.70	77.13	74.67	71.27	74.94
Soybean + wheat residue @3 t/ha	78.23	77.80	78.63	78.00	78.17
Mean	75.30	75.31	74.91	73.93	74.86
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	1.44	3.95	6.65	
Residue management (B)	**	1.27	3.06	5.86	
B within A	N.S.	2.53	6.13		
A within B		2.62	6.34		
<b>Lodging Score</b>					
Control	3.30	3.73	3.67	3.13	3.46
Wheat residue @3 t/ha	2.90	4.30	4.53	4.23	3.99
Soybean residue @3 t/ha	3.90	3.83	3.50	4.30	3.88
Soybean + wheat residue @3 t/ha	3.23	4.07	3.73	3.47	3.63
Mean	3.33	3.98	3.86	3.78	3.74
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.19	0.53	17.83	
Residue management (B)	N.S.	0.38	0.93	35.60	
B within A	N.S.	0.77	1.86		
A within B		0.69	1.68		
<b>Biomass, q/ha</b>					
Control	56.49	60.59	45.96	46.71	52.44
Wheat residue @3 t/ha	59.50	61.09	61.19	63.34	61.28
Soybean residue @3 t/ha	60.47	60.62	46.30	52.49	54.97
Soybean + wheat residue @3 t/ha	65.21	68.95	61.18	63.91	64.81
Mean	60.42	62.81	53.66	56.61	58.38
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	2.43	6.67	14.39	
Residue management (B)	**	1.65	4.00	9.80	
B within A	N.S.	3.30	7.99		
A within B		3.75	9.07		
Date of Sowing:	15.11.2021	Date of Harvesting:	22.03.2022		

<b>Table 6.27.2. Peninsular Zone</b>	<b>SPL-6</b>		<b>Niphad</b>		<b>2021-22</b>
	<b>Tillage</b>				
Residue management	CT-Flat bed	ZT-Flat bed	CT-Broad bed	ZT-Broad bed	Mean
<b>Yield, q/ha</b>					
Control	55.43	48.80	46.60	47.20	49.51
Wheat residue @3 t/ha	58.69	55.39	59.50	45.10	54.67
Soybean residue @3 t/ha	63.13	52.22	62.15	49.87	56.84
Soybean + wheat residue @3 t/ha	59.84	55.35	59.90	49.67	56.19
Mean	59.27	52.94	57.04	47.96	54.30
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	1.11	3.05	7.08	
Residue management (B)	**	1.17	2.84	7.48	
B within A	N.S.	2.34	5.67		
A within B		2.31	5.60		

<b>Earheads/sqm</b>					
Control	386	354	409	380	382
Wheat residue @3 t/ha	409	405	395	375	396
Soybean residue @3 t/ha	416	409	401	388	404
Soybean + wheat residue @3 t/ha	425	416	403	392	409
Mean	409	396	402	384	398
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	2.95	8.09	2.57	
Residue management (B)	**	3.38	8.17	2.94	
B within A	**	6.75	16.34		
A within B		6.55	15.84		
<b>Grains/Earhead</b>					
Control	30.59	29.87	26.30	28.85	28.90
Wheat residue @3 t/ha	30.76	29.07	32.42	27.22	29.87
Soybean residue @3 t/ha	32.37	28.18	35.48	29.48	31.38
Soybean + wheat residue @3 t/ha	29.27	28.20	33.13	29.67	30.07
Mean	30.75	28.83	31.83	28.81	30.05
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.77	2.11	8.84	
Residue management (B)	N.S.	0.71	1.73	8.22	
B within A	*	1.43	3.45		
A within B		1.45	3.52		
<b>1000 Grains Weight, g</b>					
Control	46.93	46.15	43.41	43.05	44.88
Wheat residue @3 t/ha	46.69	47.10	46.40	44.25	46.11
Soybean residue @3 t/ha	46.92	45.22	43.72	43.67	44.88
Soybean + wheat residue @3 t/ha	48.30	47.28	44.83	42.73	45.79
Mean	47.21	46.44	44.59	43.43	45.41
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	0.30	0.82	2.27	
Residue management (B)	*	0.32	0.78	2.47	
B within A	N.S.	0.65	1.57		
A within B		0.64	1.54		
<b>Plant Height, cm</b>					
Control	72.53	73.50	74.03	71.60	72.92
Wheat residue @3 t/ha	87.53	84.73	82.20	75.60	82.52
Soybean residue @3 t/ha	86.33	82.87	81.27	80.27	82.68
Soybean + wheat residue @3 t/ha	85.33	85.23	80.67	82.03	83.32
Mean	82.93	81.58	79.54	77.38	80.36
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	*	0.84	2.31	3.63	
Residue management (B)	**	0.87	2.09	3.73	
B within A	N.S.	1.73	4.19		
A within B		1.72	4.16		

<b>Biomass, q/ha</b>					
Control	69.29	61.49	58.72	59.94	62.36
Wheat residue @3 t/ha	75.12	71.45	76.76	58.18	70.38
Soybean residue @3 t/ha	82.70	68.40	81.41	65.33	74.46
Soybean + wheat residue @3 t/ha	78.98	73.62	79.67	65.56	74.46
Mean	76.52	68.74	74.14	62.25	70.41
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	1.43	3.94	7.06	
Residue management (B)	**	1.52	3.68	7.47	
B within A	N.S.	3.04	7.35		
A within B		3.00	7.25		
Date of Sowing:	27.11.2021	Date of Harvesting:	12.03.2022		

**Table 6.27.3. Peninsular Zone SPL-6 Pune 2021-22**

Residue management	Tillage				Mean
	CT-Flat bed	ZT-Flat bed	CT-Broad bed	ZT-Broad bed	
<b>Yield, q/ha</b>					
Control	62.53	74.59	78.32	78.32	73.44
Wheat residue @3 t/ha	63.59	67.98	74.78	78.22	71.14
Soybean residue @3 t/ha	66.47	75.45	72.52	80.24	73.67
Soybean + wheat residue @3 t/ha	73.01	68.82	77.60	81.10	75.14
Mean	66.40	71.71	75.81	79.47	73.35
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	1.70	4.67	8.03	
Residue management (B)	N.S.	1.73	4.18	8.15	
B within A	N.S.	3.45	8.36		
A within B		3.44	8.32		
<b>Earheads/sqm</b>					
Control	287	313	348	393	335
Wheat residue @3 t/ha	307	327	345	367	336
Soybean residue @3 t/ha	297	313	347	413	343
Soybean + wheat residue @3 t/ha	338	303	298	367	327
Mean	307	314	335	385	335
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	**	11.10	30.49	11.47	
Residue management (B)	N.S.	13.94	33.73	14.41	
B within A	N.S.	27.88	67.47		
A within B		26.58	64.30		
<b>Grains/Earhead</b>					
Control	52.56	55.59	53.11	46.02	51.82
Wheat residue @3 t/ha	50.76	48.96	49.65	51.97	50.34
Soybean residue @3 t/ha	54.08	56.84	49.93	44.85	51.43
Soybean + wheat residue @3 t/ha	48.87	54.36	59.77	53.88	54.22
Mean	51.57	53.94	53.12	49.18	51.95
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	1.73	4.74	11.51	
Residue management (B)	N.S.	2.23	5.39	14.86	
B within A	N.S.	4.46	10.78		
A within B		4.23	10.23		

<b>1000 Grains Weight, g</b>					
Control	42.20	43.20	43.07	43.27	42.93
Wheat residue @3 t/ha	40.73	42.93	44.07	41.40	42.28
Soybean residue @3 t/ha	41.47	42.53	44.27	43.47	42.93
Soybean + wheat residue @3 t/ha	44.40	42.07	44.33	41.47	43.07
Mean	42.20	42.68	43.93	42.40	42.80
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.47	1.13	3.91	
Residue management (B)	N.S.	0.93	2.26	3.78	
B within A	N.S.	0.94	2.28		
A within B		0.66	1.93		
<b>Plant Height, cm</b>					
Control	88.67	87.33	83.67	84.33	86.00
Wheat residue @3 t/ha	84.33	89.33	86.00	91.00	87.67
Soybean residue @3 t/ha	86.67	86.33	87.67	87.33	87.00
Soybean + wheat residue @3 t/ha	85.67	86.67	85.33	87.33	86.25
Mean	86.33	87.42	85.67	87.50	86.73
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	0.58	1.60	2.33	
Residue management (B)	N.S.	0.76	1.83	3.02	
B within A	N.S.	1.51	3.66		
A within B		1.43	3.47		
<b>Biomass, q/ha</b>					
Control	174.67	190.28	189.40	186.16	185.13
Wheat residue @3 t/ha	170.14	186.06	173.34	185.83	178.84
Soybean residue @3 t/ha	175.28	186.62	175.46	183.80	180.29
Soybean + wheat residue @3 t/ha	178.24	173.01	174.91	171.58	174.43
Mean	174.58	183.99	178.28	181.84	179.67
	F. Test	SEm	CD (0.05)	CV (%)	
Tillage (A)	N.S.	7.11	19.55	13.71	
Residue management (B)	N.S.	3.23	7.81	6.22	
B within A	N.S.	6.46	15.62		
A within B		9.05	21.89		
Date of Sowing:	29.11.2021	Date of Harvesting:	25.03.2022		



Table 6.30.1. North Eastern Plains Zone

Foliar K Application	SPL-8		Kanpur		2021-22		Mean	Rk
	Irrigation Levels							
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	35.68	3	44.21	3	44.21	3	41.37	3
2% K at tillering and jointing	41.15	2	47.61	2	46.59	2	45.12	2
4% K at tillering and jointing	41.83	1	51.02	1	47.61	1	46.82	1
Mean	39.55		47.61		46.14		44.43	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.60		1.80		4.02	
Foliar K (B)	**		0.83		2.09		5.60	
B within A	N.S.		1.44		3.62			
A within B			1.31		3.31			
<b>Earheads/sqm</b>								
Control (Water spray)	349	3	353	3	366	3	356	3
2% K at tillering and jointing	369	2	388	2	380	2	379	2
4% K at tillering and jointing	410	1	396	1	394	1	400	1
Mean	376		379		380		378	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		3		9		2	
Foliar K (B)	**		1		3		1	
B within A	**		2		5			
A within B			3		9			
<b>Grains/Earhead</b>								
Control (Water spray)	15.71	3	24.01	1	23.39	2	21.04	2
2% K at tillering and jointing	15.74	2	24.00	2	23.55	1	21.10	1
4% K at tillering and jointing	23.52	1	23.60	3	15.32	3	20.81	3
Mean	18.32		23.87		20.76		20.98	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.1		0.3		1.3	
Foliar K (B)	N.S.		0.2		0.5		2.8	
B within A	**		0.3		0.8			
A within B			0.3		0.7			
<b>1000 Grains Weight, g</b>								
Control (Water spray)	36.80	3	41.23	3	42.43	1	40.15	3
2% K at tillering and jointing	41.05	2	44.84	2	40.26	3	42.05	2
4% K at tillering and jointing	41.47	1	48.77	1	42.13	2	44.12	1
Mean	39.78		44.94		41.61		42.11	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		2.56		7.72		18.95	
Foliar K (B)	N.S.		2.73		6.87		20.18	
B within A	N.S.		4.73		11.91			
A within B			4.63		11.67			
<b>Biomass,q/ha</b>								
Control (Water spray)	126.85	3	154.03	3	156.40	2	145.76	3
2% K at tillering and jointing	154.74	1	164.93	2	159.87	1	159.85	1
4% K at tillering and jointing	149.63	2	173.40	1	156.10	3	159.71	2
Mean	143.74		164.12		157.46		155.11	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.99		2.99		1.92	
Foliar K (B)	**		1.98		4.99		3.83	
B within A	*		3.43		8.65			
A within B			2.97		7.49			
Date of Sowing:	18.11.2021		Date of Harvesting:		01.05.2022			

Foliar K Application	SPL-8		Shillongani		2021-22			
	Irrigation Levels							
	One	Rk	Two	Rk	Three	Rk	Mean	Rk
<b>Yield, q/ha</b>								
Control (Water spray)	35.32	3	40.03	3	41.93	3	39.10	3
2% K at tillering and jointing	45.55	1	45.81	1	45.82	1	45.72	1
4% K at tillering and jointing	44.50	2	44.82	2	45.61	2	44.98	2
Mean	41.79		43.55		44.45		43.27	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.21		0.63		1.44	
Foliar K (B)	**		0.49		1.24		3.42	
B within A	*		0.86		2.16			
A within B			0.73		1.84			
<b>Earheads/sqm</b>								
Control (Water spray)	171	3	164	3	187	3	174	3
2% K at tillering and jointing	206	2	189	2	207	2	200	2
4% K at tillering and jointing	226	1	209	1	218	1	218	1
Mean	201		187		204		197	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		9		27		14	
Foliar K (B)	**		3		8		5	
B within A	N.S.		5		14			
A within B			10		25			
<b>Grains/Earhead</b>								
Control (Water spray)	16.46	3	19.80	3	20.56	1	18.94	1
2% K at tillering and jointing	16.47	2	20.06	2	19.82	2	18.78	2
4% K at tillering and jointing	18.76	1	20.14	1	16.16	3	18.35	3
Mean	17.23		20.00		18.85		18.69	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	**		0.3		0.8		4.4	
Foliar K (B)	N.S.		0.7		1.7		10.5	
B within A	N.S.		1.1		2.9			
A within B			1.0		2.4			
<b>1000 Grains Weight, g</b>								
Control (Water spray)	38.37	2	38.03	2	37.17	3	37.86	3
2% K at tillering and jointing	45.00	1	45.00	1	42.80	1	44.27	1
4% K at tillering and jointing	37.73	3	37.93	3	38.53	2	38.07	2
Mean	40.37		40.32		39.50		40.06	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.26		0.78		1.93	
Foliar K (B)	**		0.21		0.52		1.55	
B within A	**		0.36		0.91			
A within B			0.39		0.98			
<b>Biomass, q/ha</b>								
Control (Water spray)	69.11	3	65.44	3	68.70	3	67.75	3
2% K at tillering and jointing	75.97	2	77.38	2	78.57	2	77.31	2
4% K at tillering and jointing	77.41	1	81.67	1	81.97	1	80.35	1
Mean	74.16		74.83		76.42		75.14	
	F. Test		SEm		CD (0.05)		CV (%)	
Irrigation (A)	N.S.		0.76		2.28		3.02	
Foliar K (B)	**		0.60		1.52		2.41	
B within A	*		1.05		2.64			
A within B			1.14		2.87			
Date of Sowing:	25.11.2021			Date of Harvesting:			12.04.2022	

**Table 6.31.1. Central Zone** **SPL-8** **Dhanduka 2021-22**

Foliar K Application	Irrigation Levels						Mean	Rk
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	24.49	3	29.52	2	28.91	3	27.64	3
2% K at tillering and jointing	27.86	2	28.50	3	34.35	2	30.24	2
4% K at tillering and jointing	28.54	1	31.02	1	37.75	1	32.44	1
Mean	26.96		29.68		33.67		30.11	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	*		0.83		2.49		8.23	
Foliar K (B)	**		0.73		1.85		7.30	
B within A	N.S.		1.27		3.20			
A within B			1.33		3.34			
<b>Earhead/sq.m.</b>								
Control (Water spray)	272	3	277	3	280	3	276	3
2% K at tillering and jointing	274	2	282	2	286	2	281	2
4% K at tillering and jointing	293	1	295	1	298	1	295	1
Mean	280		284		288		284	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		5.00		15.09		5.29	
Foliar K (B)	*		4.83		12.18		5.10	
B within A	N.S.		8.37		21.09			
A within B			8.47		21.34			
<b>Grains/earhead</b>								
Control (Water spray)	23.9	2	28.0	1	26.5	3	26.1	2
2% K at tillering and jointing	25.0	1	25.4	2	28.2	1	26.2	1
4% K at tillering and jointing	22.8	3	23.9	3	28.1	2	24.9	3
Mean	23.9		25.7		27.6		25.8	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		0.39		1.18		4.56	
Foliar K (B)	N.S.		0.79		1.99		9.21	
B within A	N.S.		1.37		3.45			
A within B			1.18		2.98			
<b>1000 grains wt, g</b>								
Control (Water spray)	37.74	3	38.20	3	39.35	3	38.43	3
2% K at tillering and jointing	40.66	2	40.00	2	42.50	2	41.06	2
4% K at tillering and jointing	42.83	1	44.12	1	45.13	1	44.03	1
Mean	40.41		40.77		42.33		41.17	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		0.86		2.61		6.30	
Foliar K (B)	**		0.72		1.82		5.25	
B within A	N.S.		1.25		3.15			
A within B			1.34		3.37			
<b>Stand Count</b>								
Control (Water spray)	87.00	2	83.33	3	85.00	3	85.11	2
2% K at tillering and jointing	80.00	3	83.67	2	87.33	2	83.67	3
4% K at tillering and jointing	88.33	1	84.67	1	90.00	1	87.67	1
Mean	85.11		83.89		87.44		85.48	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		2.68		8.07		9.40	
Foliar K (B)	N.S.		1.15		2.91		4.05	
B within A	N.S.		2.00		5.04			
A within B			3.14		7.90			
<b>Biomass, q/ha</b>								
Control (Water spray)	58.57	3	74.83	1	73.64	3	69.01	3
2% K at tillering and jointing	61.05	1	69.46	3	78.23	2	69.58	2
4% K at tillering and jointing	59.56	2	73.16	2	80.65	1	71.12	1
Mean	59.73		72.48		77.51		69.90	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		2.02		6.10		8.69	
Foliar K (B)	N.S.		1.92		4.83		8.23	
B within A	N.S.		3.32		8.37			
A within B			3.38		8.53			
Date of Sowing:	08.11.2021		Date of Harvesting:					

**Table 6.31.2. Central Zone** **SPL-8** **Durgapura 2021-22**

Foliar K Application	Irrigation Levels						Mean	Rk
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	24.52	3	28.92	3	31.92	3	28.45	3
2% K at tillering and jointing	26.83	2	29.61	2	37.48	2	31.31	2
4% K at tillering and jointing	27.53	1	32.62	1	37.71	1	32.62	1
Mean	26.29		30.38		35.70		30.79	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		0.37		1.12		3.63	
Foliar K (B)	*		0.93		2.35		9.09	
B within A	N.S.		1.62		4.07			
A within B			1.37		3.46			
<b>Earhead/sq.m.</b>								
Control (Water spray)	249	3	293	3	307	3	283	3
2% K at tillering and jointing	270	2	295	2	324	1	296	2
4% K at tillering and jointing	277	1	309	1	324	1	303	1
Mean	265		299		318		294	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		5.43		16.38		5.54	
Foliar K (B)	**		3.73		9.39		3.80	
B within A	N.S.		6.46		16.27			
A within B			7.57		19.08			
<b>Grains/earhead</b>								
Control (Water spray)	23.9	2	24.1	3	25.0	3	24.3	3
2% K at tillering and jointing	23.9	3	24.3	2	27.8	2	25.3	2
4% K at tillering and jointing	24.2	1	25.4	1	27.8	1	25.8	1
Mean	24.0		24.6		26.9		25.2	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	*		0.50		1.51		5.99	
Foliar K (B)	N.S.		0.48		1.20		5.69	
B within A	N.S.		0.83		2.08			
A within B			0.84		2.12			
<b>1000 grains wt, g</b>								
Control (Water spray)	41.23	2	41.07	3	41.80	1	41.37	3
2% K at tillering and jointing	41.72	1	41.20	2	41.65	3	41.52	1
4% K at tillering and jointing	41.20	3	41.47	1	41.67	2	41.44	2
Mean	41.38		41.24		41.71		41.45	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		0.86		2.61		6.26	
Foliar K (B)	N.S.		0.74		1.86		5.33	
B within A	N.S.		1.28		3.22			
A within B			1.35		3.41			
<b>Stand Count</b>								
Control (Water spray)	97.67	3	99.33	1	98.67	2	98.56	2
2% K at tillering and jointing	99.67	1	99.33	1	98.00	3	99.00	1
4% K at tillering and jointing	98.33	2	97.00	3	99.67	1	98.33	3
Mean	98.56		98.56		98.78		98.63	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		0.81		2.45		2.47	
Foliar K (B)	N.S.		1.29		3.25		3.92	
B within A	N.S.		2.23		5.62			
A within B			1.99		5.03			
<b>Biomass, q/ha</b>								
Control (Water spray)	64.87	3	77.02	3	82.17	3	74.69	3
2% K at tillering and jointing	71.79	2	80.96	2	102.53	2	85.10	2
4% K at tillering and jointing	72.66	1	87.63	1	103.56	1	87.95	1
Mean	69.77		81.87		96.09		82.58	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		1.19		3.59		4.33	
Foliar K (B)	**		2.63		6.64		9.57	
B within A	N.S.		4.56		11.50			
A within B			3.91		9.86			
Date of Sowing:	20.11.2021		Date of Harvesting:					

**Table 6.31.3. Central Zone** **SPL-8** **Jabalpur** **2021-22**

Foliar K Application	Irrigation Levels						Mean	Rk
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	30.82	3	34.85	3	37.15	3	34.27	3
2% K at tillering and jointing	35.54	2	39.31	2	42.55	2	39.14	2
4% K at tillering and jointing	37.14	1	42.01	1	44.83	1	41.33	1
Mean	34.50		38.73		41.51		38.25	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	*		0.87		2.62		6.81	
Foliar K (B)	**		0.92		2.31		7.18	
B within A	N.S.		1.59		4.00			
A within B			1.56		3.93			
<b>Earhead/sq.m.</b>								
Control (Water spray)	201	3	258	3	274	3	244	3
2% K at tillering and jointing	238	2	272	1	290	2	267	2
4% K at tillering and jointing	251	1	271	2	307	1	276	1
Mean	230		267		290		263	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		3.31		9.99		3.79	
Foliar K (B)	**		3.78		9.52		4.32	
B within A	N.S.		6.55		16.50			
A within B			6.29		15.85			
<b>Grains/earhead</b>								
Control (Water spray)	42.0	1	33.3	3	32.7	3	36.0	1
2% K at tillering and jointing	38.0	2	35.3	2	34.0	1	35.8	2
4% K at tillering and jointing	36.3	3	35.8	1	33.0	2	35.0	3
Mean	38.7		34.8		33.2		35.6	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		0.58		1.75		4.89	
Foliar K (B)	N.S.		1.33		3.36		11.25	
B within A	N.S.		2.31		5.82			
A within B			1.97		4.97			
<b>1000 grains wt, g</b>								
Control (Water spray)	36.47	3	40.72	3	41.49	3	39.56	3
2% K at tillering and jointing	39.28	2	41.17	2	43.03	2	41.16	2
4% K at tillering and jointing	40.98	1	43.63	1	44.57	1	43.06	1
Mean	38.91		41.84		43.03		41.26	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	*		0.53		1.60		3.87	
Foliar K (B)	*		0.85		2.14		6.17	
B within A	N.S.		1.47		3.71			
A within B			1.31		3.31			
<b>Stand Count</b>								
Control (Water spray)	81.00	3	107.33	3	109.67	3	99.33	3
2% K at tillering and jointing	94.33	2	108.00	2	111.33	2	104.56	2
4% K at tillering and jointing	96.67	1	110.00	1	114.33	1	107.00	1
Mean	90.67		108.44		111.78		103.63	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		2.00		6.03		5.79	
Foliar K (B)	*		1.79		4.50		5.17	
B within A	N.S.		3.10		7.80			
A within B			3.22		8.12			
<b>Biomass, q/ha</b>								
Control (Water spray)	52.27	3	60.66	3	67.64	3	60.19	3
2% K at tillering and jointing	58.72	2	69.60	2	73.20	2	67.17	2
4% K at tillering and jointing	61.69	1	72.84	1	76.30	1	70.28	1
Mean	57.56		67.70		72.38		65.88	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		1.30		3.92		5.92	
Foliar K (B)	**		1.42		3.57		6.45	
B within A	N.S.		2.45		6.18			
A within B			2.39		6.02			
Date of Sowing:	08.11.2021		Date of Harvesting:			24.03.2022		

Table 6.31.4. Central Zone

SPL-8

Vijapur 2021-22

Foliar K Application	Irrigation Levels						Mean	Rk
	One	Rk	Two	Rk	Three	Rk		
<b>Yield, q/ha</b>								
Control (Water spray)	25.13	3	36.38	2	43.00	1	34.83	2
2% K at tillering and jointing	26.17	1	37.63	1	41.96	3	35.25	1
4% K at tillering and jointing	25.29	2	36.33	3	42.79	2	34.81	3
Mean	25.53		36.78		42.58		34.96	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		1.10		3.33		9.47	
Foliar K (B)	N.S.		0.91		2.28		7.78	
B within A	N.S.		1.57		3.96			
A within B			1.69		4.26			
<b>Earhead/sq.m.</b>								
Control (Water spray)	345	2	402	1	407	3	384	2
2% K at tillering and jointing	314	3	374	3	418	2	369	3
4% K at tillering and jointing	365	1	375	2	425	1	388	1
Mean	341		384		416		381	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	*		9.79		29.51		7.72	
Foliar K (B)	N.S.		9.80		24.69		7.72	
B within A	N.S.		16.97		42.77			
A within B			16.96		42.75			
<b>Grains/earhead</b>								
Control (Water spray)	16.5	3	20.3	3	21.9	1	19.6	3
2% K at tillering and jointing	19.3	1	23.4	1	20.5	3	21.1	1
4% K at tillering and jointing	18.2	2	20.8	2	21.2	2	20.1	2
Mean	18.0		21.5		21.2		20.2	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		0.77		2.31		11.34	
Foliar K (B)	N.S.		0.79		1.99		11.71	
B within A	N.S.		1.37		3.45			
A within B			1.35		3.41			
<b>1000 grains wt, g</b>								
Control (Water spray)	44.48	1	45.49	2	48.42	2	46.13	1
2% K at tillering and jointing	43.39	2	43.04	3	48.83	1	45.09	2
4% K at tillering and jointing	38.50	3	46.36	1	47.51	3	44.12	3
Mean	42.12		44.97		48.25		45.11	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		0.52		1.56		3.45	
Foliar K (B)	N.S.		1.37		3.44		9.08	
B within A	N.S.		2.37		5.96			
A within B			2.00		5.04			
<b>Stand Count</b>								
Control (Water spray)	297.00	1	305.33	1	312.33	1	304.89	1
2% K at tillering and jointing	288.00	3	280.00	2	266.67	3	278.22	3
4% K at tillering and jointing	290.33	2	273.33	3	275.67	2	279.78	2
Mean	291.78		286.22		284.89		287.63	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	N.S.		10.79		32.54		11.26	
Foliar K (B)	N.S.		10.62		26.76		11.08	
B within A	N.S.		18.39		46.35			
A within B			18.49		46.61			
<b>Biomass, q/ha</b>								
Control (Water spray)	68.53	1	103.36	2	115.70	2	95.86	2
2% K at tillering and jointing	66.82	2	102.41	3	115.24	3	94.82	3
4% K at tillering and jointing	65.86	3	105.70	1	119.41	1	96.99	1
Mean	67.07		103.82		116.78		95.89	
	F. Test		SEm		CD (0.05)		C.V.(%)	
Irrigation (A)	**		2.86		8.63		8.96	
Foliar K (B)	N.S.		2.61		6.57		8.15	
B within A	N.S.		4.51		11.37			
A within B			4.67		11.76			
Date of Sowing:	16.11.2021		Date of Harvesting:			11.03.2022		

Table 6.32.1. Peninsular Zone

Foliar K Application	SPL-8						Dharwad		2021-22	
	Irrigation Levels						Mean	Rk		
	One	Rk	Two	Rk	Three	Rk				
<b>Yield, q/ha</b>										
Control (Water spray)	26.09	3	27.11	3	27.45	3	26.89	3		
2% K at tillering and jointing	29.31	1	30.29	1	31.90	1	30.50	1		
4% K at tillering and jointing	27.85	2	29.54	2	30.33	2	29.24	2		
Mean	27.75		28.98		29.90		28.88			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		0.86		2.59		8.93			
Foliar K (B)	N.S.		1.16		2.92		12.03			
B within A	N.S.		2.01		5.05					
A within B			1.85		4.66					
<b>Earheads/sqm</b>										
Control (Water spray)	177	3	184	3	200	3	187	3		
2% K at tillering and jointing	212	1	217	1	229	1	219	1		
4% K at tillering and jointing	207	2	216	2	218	2	214	2		
Mean	199		205		216		207			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		4.71		14.21		6.84			
Foliar K (B)	**		5.14		12.95		7.46			
B within A	N.S.		8.90		22.42					
A within B			8.66		21.82					
<b>Grains/Earhead</b>										
Control (Water spray)	47.91	1	45.80	1	41.83	1	45.18	1		
2% K at tillering and jointing	41.09	3	39.87	3	37.41	3	39.46	3		
4% K at tillering and jointing	41.24	2	40.63	2	38.28	2	40.05	2		
Mean	43.41		42.10		39.17		41.56			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		1.52		4.59		11.00			
Foliar K (B)	N.S.		2.52		6.35		18.19			
B within A	N.S.		4.37		11.00					
A within B			3.88		9.77					
<b>1000 Grains Weight, g</b>										
Control (Water spray)	30.86	3	32.54	3	33.06	3	32.15	3		
2% K at tillering and jointing	33.79	1	35.57	1	37.43	1	35.60	1		
4% K at tillering and jointing	33.14	2	33.84	2	36.58	2	34.52	2		
Mean	32.60		33.98		35.69		34.09			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		0.61		1.84		5.37			
Foliar K (B)	**		0.42		1.07		3.72			
B within A	N.S.		0.73		1.85					
A within B			0.85		2.15					
<b>Lodging Score</b>										
Control (Water spray)	1.03	3	1.17	2	1.03	3	1.08	3		
2% K at tillering and jointing	3.00	1	1.50	1	1.60	2	2.03	1		
4% K at tillering and jointing	2.47	2	1.07	3	1.77	1	1.77	2		
Mean	2.17		1.24		1.47		1.63			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		0.27		0.82		50.31			
Foliar K (B)	**		0.16		0.40		29.20			
B within A	*		0.27		0.69					
A within B			0.35		0.89					
<b>Biomass, q/ha</b>										
Control (Water spray)	49.05	3	50.35	3	52.29	3	50.56	3		
2% K at tillering and jointing	55.70	1	61.54	1	65.49	1	60.91	1		
4% K at tillering and jointing	54.11	2	57.63	2	63.08	2	58.27	2		
Mean	52.95		56.51		60.28		56.58			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	N.S.		2.33		7.02		12.34			
Foliar K (B)	*		2.62		6.60		13.88			
B within A	N.S.		4.54		11.43					
A within B			4.37		11.02					
Date of Sowing:	10.11.2021		Date of Harvesting:							

Table 6.32.2. Peninsular Zone

Foliar K Application	SPL-8						Pune		2021-22	
	Irrigation Levels						Mean	Rk		
	One	Rk	Two	Rk	Three	Rk				
<b>Yield, q/ha</b>										
Control (Water spray)	20.06	2	28.46	3	31.82	3	26.78	3		
2% K at tillering and jointing	17.50	3	29.77	2	35.37	2	27.54	2		
4% K at tillering and jointing	27.50	1	31.94	1	39.06	1	32.84	1		
Mean	21.69		30.06		35.42		29.05			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	**		0.67		2.02		6.90			
Foliar K (B)	*		1.34		3.36		13.79			
B within A	N.S.		2.31		5.83					
A within B			2.00		5.05					
<b>Earheads/sqm</b>										
Control (Water spray)	178	2	250	2	327	2	252	3		
2% K at tillering and jointing	198	1	218	3	363	1	260	1		
4% K at tillering and jointing	163	3	283	1	320	3	256	2		
Mean	180		251		337		256			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	**		7.64		23.05		8.97			
Foliar K (B)	N.S.		8.96		22.57		10.51			
B within A	*		15.51		39.09					
A within B			14.79		37.28					
<b>Grains/Earhead</b>										
Control (Water spray)	25.60	2	27.99	2	22.88	3	25.49	2		
2% K at tillering and jointing	19.40	3	31.40	1	23.55	2	24.78	3		
4% K at tillering and jointing	37.15	1	26.76	3	29.63	1	31.18	1		
Mean	27.38		28.72		25.35		27.15			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	*		0.62		1.88		6.87			
Foliar K (B)	*		1.54		3.89		17.05			
B within A	*		2.67		6.73					
A within B			2.27		5.72					
<b>1000 Grains Weight, g</b>										
Control (Water spray)	46.07	1	41.07	3	42.93	1	43.36	2		
2% K at tillering and jointing	45.47	2	43.73	1	41.80	3	43.67	1		
4% K at tillering and jointing	45.27	3	42.20	2	41.87	2	43.11	3		
Mean	45.60		42.33		42.20		43.38			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	*		0.57		1.72		3.94			
Foliar K (B)	N.S.		0.40		1.01		2.78			
B within A	N.S.		0.70		1.75					
A within B			0.80		2.03					
<b>Biomass, q/ha</b>										
Control (Water spray)	56.26	1	69.36	3	93.03	2	72.88	2		
2% K at tillering and jointing	50.03	3	75.27	2	92.27	3	72.53	3		
4% K at tillering and jointing	53.36	2	75.60	1	96.53	1	75.16	1		
Mean	53.22		73.41		93.95		73.52			
	F. Test		SEm		CD (0.05)		CV (%)			
Irrigation (A)	**		2.32		7.01		9.48			
Foliar K (B)	N.S.		3.62		9.12		14.76			
B within A	N.S.		6.26		15.79					
A within B			5.62		14.16					
Date of Sowing:	04.11.2021			Date of Harvesting:			12.03.2022			



<b>Table 6.33.1. North Western Plains Zone</b>		<b>SPL-9</b>		<b>Gurdaspur</b>				<b>2021-22</b>		
Nutrients foliar spray					Varieties				Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
<b>Yield, q/ha</b>										
No foliar fertilization	49.05	6	43.68	6	53.72	6	51.05	6	49.37	6
S (2% S)	56.31	3	46.28	5	55.81	4	55.90	2	53.58	3
N (2% Urea)	56.79	2	48.53	1	55.73	5	56.06	1	54.28	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	54.88	4	46.91	2	58.00	2	52.50	4	53.07	4
KCl 1%	52.15	5	46.73	3	57.80	3	52.41	5	52.27	5
S+N+Zn+KCl	56.87	1	46.44	4	61.94	1	52.63	3	54.47	1
Mean	54.34		46.43		57.17		53.43		52.84	
<b>Earhead/sq.m.</b>										
F. Test                      SEm                      CD (0.05)                      CV (%)										
Variety (A)	**		1.14		3.94		9.15			
Nutrients Spray (B)	**		0.85		2.42		5.56			
B within A	N.S.		1.70		4.85					
A within B			1.92		5.49					
<b>1000 grains weight, g</b>										
No foliar fertilization	298	6	290	6	311	6	334	3	308	6
S (2% S)	369	1	311	4	312	5	337	2	332	3
N (2% Urea)	350	2	309	5	342	3	337	1	334	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	326	4	343	1	330	4	321	5	330	4
KCl 1%	317	5	318	2	359	2	311	6	326	5
S+N+Zn+KCl	330	3	317	3	366	1	331	4	336	1
Mean	331		315		337		328		328	
F. Test                      SEm                      CD (0.05)                      CV (%)										
Variety (A)	*		3.54		12.26		4.59			
Nutrients Spray (B)	**		3.69		10.55		3.90			
B within A	**		7.38		21.09					
A within B			7.61		21.76					
<b>Grains per ear head</b>										
No foliar fertilization	45.70	2	41.87	2	43.56	3	43.44	6	43.64	1
S (2% S)	41.17	6	41.63	3	44.99	1	45.21	2	43.25	5
N (2% Urea)	43.84	5	43.77	1	40.47	6	45.02	3	43.27	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	44.64	4	37.55	6	44.54	2	44.08	4	42.70	6
KCl 1%	45.00	3	40.78	4	41.74	5	46.83	1	43.59	2
S+N+Zn+KCl	46.52	1	39.98	5	43.18	4	43.89	5	43.39	3
Mean	44.48		40.93		43.08		44.74		43.31	
F. Test                      SEm                      CD (0.05)                      CV (%)										
Variety (A)	N.S.		1.35		4.68		13.25			
Nutrients Spray (B)	N.S.		0.98		2.80		7.84			
B within A	N.S.		1.96		5.60					
A within B			2.24		6.41					
<b>Biomass, q/ha</b>										
No foliar fertilization	122.76	6	124.07	4	135.92	6	124.72	6	126.87	6
S (2% S)	140.61	2	119.70	6	143.45	2	135.62	3	134.84	3
N (2% Urea)	140.31	3	127.22	3	137.22	5	140.41	1	136.29	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	133.60	4	128.17	1	139.91	4	134.11	4	133.95	4
KCl 1%	132.31	5	127.47	2	140.99	3	128.28	5	132.26	5
S+N+Zn+KCl	143.06	1	119.94	5	145.69	1	138.66	2	136.84	1
Mean	135.44		124.43		140.53		133.63		133.51	
F. Test                      SEm                      CD (0.05)                      CV (%)										
Variety (A)	**		2.12		7.35		6.75			
Nutrients Spray (B)	**		1.75		4.99		4.53			
B within A	N.S.		3.49		9.98					
A within B			3.83		10.95					

<b>Table 6.33.2. North Western Plains Zone</b>		<b>SPL-9</b>		<b>Hisar</b>				<b>2021-22</b>		
Nutrients foliar spray	Varieties								Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
<b>Yield, q/ha</b>										
No foliar fertilization	52.07	6	42.62	6	56.19	6	51.33	6	50.55	6
S (2% S)	54.01	4	43.91	5	57.14	5	52.86	5	51.98	5
N (2% Urea)	54.80	2	45.51	3	58.81	2	54.97	2	53.52	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	53.95	5	45.48	4	57.55	4	53.44	4	52.60	4
KCl 1%	54.12	3	46.73	2	57.65	3	54.59	3	53.27	3
S+N+Zn+KCl	56.90	1	49.32	1	61.26	1	55.10	1	55.65	1
Mean	54.31		45.60		58.10		53.71		52.93	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.95		3.27		7.58			
Nutrients Spray (B)	**		0.71		2.02		4.64			
B within A	N.S.		1.42		4.05					
A within B			1.60		4.58					
<b>Earhead/sq.m.</b>										
No foliar fertilization	410	6	393	4	418	6	395	6	404	6
S (2% S)	418	4	400	1	423	5	402	5	411	4
N (2% Urea)	425	3	397	3	430	3	412	3	416	3
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	417	5	392	5	427	4	404	4	410	5
KCl 1%	428	2	391	6	433	2	413	2	416	2
S+N+Zn+KCl	435	1	400	1	437	1	425	1	424	1
Mean	422		395		428		409		414	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	*		5.93		20.51		6.08			
Nutrients Spray (B)	N.S.		6.84		19.55		5.73			
B within A	N.S.		13.68		39.10					
A within B			13.82		39.51					
<b>1000 grains weight, g</b>										
No foliar fertilization	32.05	6	33.42	6	36.18	6	35.42	6	34.27	6
S (2% S)	33.55	5	34.20	2	37.20	4	36.74	5	35.42	5
N (2% Urea)	34.77	2	34.08	3	37.21	3	37.21	3	35.82	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	34.30	4	33.52	5	36.68	5	37.40	2	35.48	4
KCl 1%	34.74	3	33.54	4	37.72	2	37.11	4	35.78	3
S+N+Zn+KCl	35.26	1	35.72	1	38.58	1	38.03	1	36.90	1
Mean	34.11		34.08		37.26		36.99		35.61	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.45		1.56		5.37			
Nutrients Spray (B)	**		0.34		0.98		3.34			
B within A	N.S.		0.69		1.96					
A within B			0.77		2.20					
<b>Grains per ear head</b>										
No foliar fertilization	39.70	1	32.55	5	37.29	1	36.73	1	36.57	1
S (2% S)	38.81	2	32.27	6	36.36	5	35.84	3	35.82	5
N (2% Urea)	37.22	4	33.75	4	36.80	3	35.93	2	35.92	3
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	37.89	3	34.78	3	36.97	2	35.35	5	36.25	2
KCl 1%	36.46	6	35.71	1	35.35	6	35.84	4	35.84	4
S+N+Zn+KCl	37.17	5	34.79	2	36.48	4	34.18	6	35.65	6
Mean	37.87		33.98		36.54		35.64		36.01	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		1.01		3.48		11.86			
Nutrients Spray (B)	N.S.		0.84		2.40		8.09			
B within A	N.S.		1.68		4.81					
A within B			1.84		5.25					
<b>Biomass, q/ha</b>										
No foliar fertilization	134.69	6	118.03	6	142.86	6	129.25	6	131.21	6
S (2% S)	136.05	5	120.75	5	144.56	5	134.35	5	133.93	5
N (2% Urea)	142.86	2	125.85	3	149.66	2	139.46	2	139.46	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	138.78	4	124.15	4	147.28	3	136.05	4	136.56	4
KCl 1%	139.46	3	126.53	2	146.94	4	137.76	3	137.67	3
S+N+Zn+KCl	146.26	1	135.37	1	156.12	1	141.16	1	144.73	1
Mean	139.68		125.11		147.90		136.34		137.26	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		2.40		8.29		7.41			
Nutrients Spray (B)	**		2.04		5.82		5.14			
B within A	N.S.		4.07		11.63					
A within B			4.42		12.64					

<b>Table 6.33.3. North Western Plains Zone</b>		<b>SPL-9</b>		<b>Ludhiana</b>				<b>2021-22</b>		
Nutrients foliar spray	Varieties								Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
<b>Yield, q/ha</b>										
No foliar fertilization	41.62	3	41.86	5	48.66	4	48.14	6	45.07	6
S (2% S)	41.88	2	41.24	6	48.78	2	49.76	1	45.42	3
N (2% Urea)	42.98	1	42.93	3	48.57	5	48.38	4	45.72	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	41.43	4	42.69	4	48.56	6	48.54	2	45.31	4
KCl 1%	40.29	6	43.68	1	51.82	1	48.18	5	45.99	1
S+N+Zn+KCl	40.53	5	43.02	2	48.68	3	48.54	3	45.19	5
Mean	41.46		42.57		49.18		48.59		45.45	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.65		2.25		6.08			
Nutrients Spray (B)	N.S.		0.73		2.08		5.55			
B within A	N.S.		1.46		4.16					
A within B			1.48		4.23					
<b>Earhead/sq.m.</b>										
No foliar fertilization	241	2	251	4	254	3	268	2	254	2
S (2% S)	240	6	251	4	248	5	270	1	252	5
N (2% Urea)	241	4	255	3	249	4	268	3	253	3
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	241	2	257	2	242	6	267	4	252	6
KCl 1%	241	5	257	1	255	1	264	6	254	1
S+N+Zn+KCl	244	1	244	6	255	2	267	5	252	4
Mean	241		253		251		267		253	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		3.35		11.60		5.62			
Nutrients Spray (B)	N.S.		3.19		9.13		4.37			
B within A	N.S.		6.39		18.25					
A within B			6.73		19.22					
<b>1000 grains weight, g</b>										
No foliar fertilization	32.26	6	39.45	6	35.04	6	35.65	5	35.60	6
S (2% S)	32.42	4	40.89	3	35.66	3	36.41	3	36.35	4
N (2% Urea)	32.31	5	39.80	5	35.71	2	36.18	4	36.00	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	33.11	2	40.89	4	35.47	4	37.10	1	36.64	3
KCl 1%	32.70	3	42.57	2	36.57	1	35.12	6	36.74	2
S+N+Zn+KCl	33.87	1	42.64	1	35.20	5	36.64	2	37.09	1
Mean	32.78		41.04		35.61		36.18		36.40	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.49		1.69		5.68			
Nutrients Spray (B)	N.S.		0.62		1.78		5.92			
B within A	N.S.		1.24		3.56					
A within B			1.24		3.53					
<b>Grains per ear head</b>										
No foliar fertilization	53.61	3	42.28	2	55.13	4	50.53	4	50.39	2
S (2% S)	54.18	2	40.16	5	55.40	3	50.75	3	50.12	3
N (2% Urea)	55.22	1	42.53	1	54.66	5	50.77	2	50.79	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	52.63	4	40.77	4	56.75	1	49.04	6	49.80	4
KCl 1%	51.33	5	40.01	6	55.59	2	52.16	1	49.77	5
S+N+Zn+KCl	49.15	6	41.38	3	54.22	6	49.66	5	48.60	6
Mean	52.69		41.19		55.29		50.48		49.91	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		1.00		3.45		8.49			
Nutrients Spray (B)	N.S.		1.27		3.62		8.80			
B within A	N.S.		2.54		7.25					
A within B			2.52		7.21					
<b>Biomass, q/ha</b>										
No foliar fertilization	107.15	3	101.59	6	123.49	4	126.18	4	114.60	6
S (2% S)	107.20	2	104.18	5	125.24	2	126.22	3	115.71	2
N (2% Urea)	106.88	4	104.55	3	128.41	1	126.67	1	116.63	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	106.77	5	105.03	2	122.38	6	125.93	6	115.03	5
KCl 1%	108.89	1	104.28	4	123.01	5	126.08	5	115.57	4
S+N+Zn+KCl	106.19	6	106.35	1	123.81	3	126.46	2	115.70	3
Mean	107.18		104.33		124.39		126.26		115.54	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		3.02		10.44		11.08			
Nutrients Spray (B)	N.S.		2.40		6.86		7.20			
B within A	N.S.		4.80		13.73					
A within B			5.32		15.21					

<b>Table 6.33.4. North Western Plains Zone</b>		<b>SPL-9</b>		<b>Pantnagar</b>				<b>2021-22</b>		
Nutrients foliar spray					Varieties				Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
<b>Yield, q/ha</b>										
No foliar fertilization	46.31	1	33.33	6	49.08	3	47.97	5	44.17	3
S (2% S)	42.81	6	33.57	4	47.89	5	50.11	2	43.60	5
N (2% Urea)	44.98	2	35.66	3	46.24	6	49.39	3	44.07	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	42.93	4	41.92	1	51.68	2	48.79	4	46.33	1
KCl 1%	43.71	3	37.39	2	52.18	1	51.60	1	46.22	2
S+N+Zn+KCl	42.92	5	33.56	5	48.21	4	47.52	6	43.05	6
Mean	43.95		35.91		49.21		49.23		44.57	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		1.02		3.54		9.73			
Nutrients Spray (B)	N.S.		1.26		3.60		9.78			
B within A	N.S.		2.52		7.20					
A within B			2.52		7.19					
<b>Earhead/sq.m.</b>										
No foliar fertilization	369	2	326	4	366	1	330	4	348	2
S (2% S)	364	3	413	1	344	4	365	1	371	1
N (2% Urea)	321	5	315	5	363	2	343	3	336	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	308	6	359	3	338	5	310	6	329	6
KCl 1%	373	1	295	6	315	6	348	2	333	5
S+N+Zn+KCl	325	4	370	2	355	3	313	5	341	3
Mean	343		346		347		335		343	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		7.46		25.83		9.24			
Nutrients Spray (B)	N.S.		10.55		30.14		10.65			
B within A	N.S.		21.09		60.28					
A within B			20.65		59.02					
<b>1000 grains weight, g</b>										
No foliar fertilization	32.08	1	34.01	2	33.37	4	31.28	4	32.68	2
S (2% S)	30.01	5	32.51	5	32.53	6	29.57	6	31.16	6
N (2% Urea)	31.05	2	34.16	1	33.68	3	32.56	2	32.86	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	30.29	4	33.11	4	34.31	2	30.77	5	32.12	5
KCl 1%	29.33	6	31.79	6	35.21	1	33.31	1	32.41	3
S+N+Zn+KCl	30.49	3	33.15	3	32.89	5	32.44	3	32.24	4
Mean	30.54		33.12		33.66		31.65		32.25	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.67		2.30		8.76			
Nutrients Spray (B)	N.S.		0.78		2.24		8.41			
B within A	N.S.		1.57		4.48					
A within B			1.58		4.51					
<b>Grains per ear head</b>										
No foliar fertilization	39.38	6	30.39	4	41.35	5	46.57	3	39.42	5
S (2% S)	39.47	5	25.12	6	43.16	3	46.40	4	38.54	6
N (2% Urea)	46.36	2	34.06	3	38.06	6	45.05	6	40.88	3
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	47.16	1	35.62	2	44.55	2	51.26	1	44.65	1
KCl 1%	40.13	4	40.37	1	47.62	1	45.26	5	43.35	2
S+N+Zn+KCl	43.46	3	27.44	5	41.67	4	46.82	2	39.85	4
Mean	42.66		32.17		42.73		46.89		41.11	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		1.93		6.67		19.88			
Nutrients Spray (B)	N.S.		1.73		4.95		14.60			
B within A	N.S.		3.46		9.90					
A within B			3.70		10.58					
<b>Biomass, q/ha</b>										
No foliar fertilization	183.15	1	139.19	4	168.50	5	172.89	3	165.93	2
S (2% S)	175.09	3	153.85	1	169.23	3	175.82	1	168.50	1
N (2% Urea)	177.29	2	139.93	3	167.77	6	164.10	5	162.27	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	168.50	5	146.52	2	170.70	2	164.84	4	162.64	4
KCl 1%	172.16	4	135.53	5	173.26	1	175.82	2	164.19	3
S+N+Zn+KCl	164.84	6	131.87	6	169.23	4	160.44	6	156.59	6
Mean	173.50		141.15		169.78		168.99		163.35	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		1.87		6.49		4.87			
Nutrients Spray (B)	N.S.		2.99		8.56		6.35			
B within A	N.S.		5.99		17.11					
A within B			5.78		16.51					

Nutrients foliar spray	SPL-9		Gurdaspur		Quality		2021-22		Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
<b>Fe Content Grains, ppm</b>										
No foliar fertilization	37.73	1	40.43	6	38.63	2	41.13	1	39.48	1
S (2% S)	36.17	4	42.50	3	37.20	6	40.60	2	39.12	2
N (2% Urea)	36.43	3	43.73	1	37.33	5	37.73	6	38.81	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	37.00	2	42.97	2	37.37	4	38.90	5	39.06	4
KCl 1%	35.87	5	41.27	4	38.67	1	40.57	3	39.09	3
S+N+Zn+KCl	34.20	6	41.07	5	37.80	3	39.53	4	38.15	6
Mean	36.23		41.99		37.83		39.74		38.95	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.66		2.29		7.21			
Nutrients Spray (B)	N.S.		0.73		2.08		6.47			
B within A	N.S.		1.45		4.16					
A within B			1.48		4.24					
<b>Zn Content Grains, ppm</b>										
No foliar fertilization	42.77	2	40.33	6	38.90	1	40.33	1	40.58	1
S (2% S)	41.63	3	40.73	4	34.77	3	39.17	3	39.08	3
N (2% Urea)	43.93	1	41.87	2	36.50	2	37.70	6	40.00	2
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	39.67	5	43.03	1	33.37	6	38.40	5	38.62	5
KCl 1%	40.00	4	40.40	5	33.60	5	39.17	3	38.29	6
S+N+Zn+KCl	38.83	6	41.83	3	34.77	3	39.97	2	38.85	4
Mean	41.14		41.37		35.32		39.12		39.24	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		1.44		4.98		15.56			
Nutrients Spray (B)	N.S.		0.80		2.29		7.08			
B within A	N.S.		1.60		4.59					
A within B			2.05		5.87					
<b>Grains Protein, %</b>										
No foliar fertilization	14.0	2	13.6	1	12.1	5	12.1	3	13.0	2
S (2% S)	13.3	3	13.2	5	12.5	1	11.9	4	12.7	3
N (2% Urea)	12.8	4	13.3	2	11.7	6	11.7	6	12.4	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	12.3	6	13.1	6	12.4	2	11.9	4	12.4	5
KCl 1%	14.0	1	13.2	4	12.3	3	12.9	1	13.1	1
S+N+Zn+KCl	12.7	5	13.2	3	12.3	4	12.2	2	12.6	4
Mean	13.2		13.3		12.2		12.1		12.7	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.18		0.63		6.07			
Nutrients Spray (B)	*		0.17		0.50		4.73			
B within A	N.S.		0.35		0.99					
A within B			0.37		1.04					
<b>Grains Hectoliter Weight, kg</b>										
No foliar fertilization	75.76	2	74.67	4	75.37	1	75.15	3	75.24	3
S (2% S)	75.43	5	75.54	2	74.82	5	75.33	2	75.28	2
N (2% Urea)	75.45	4	74.75	3	75.30	2	75.03	4	75.13	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	76.26	1	76.00	1	74.08	6	75.35	1	75.42	1
KCl 1%	75.54	3	74.58	6	75.29	3	74.64	5	75.01	5
S+N+Zn+KCl	75.30	6	74.60	5	75.22	4	74.51	6	74.91	6
Mean	75.62		75.02		75.01		75.00		75.17	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.89		3.09		5.04			
Nutrients Spray (B)	N.S.		0.21		0.61		0.99			
B within A	N.S.		0.43		1.22					
A within B			0.98		2.79					
<b>Grains Starch, %</b>										
No foliar fertilization	63.17	6	63.70	6	64.00	6	64.23	4	63.78	6
S (2% S)	63.77	4	64.47	1	64.63	2	64.53	2	64.35	3
N (2% Urea)	63.97	3	63.77	5	65.13	1	65.00	1	64.47	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	64.80	1	64.40	2	64.10	5	64.33	3	64.41	2
KCl 1%	63.20	5	64.20	3	64.33	4	63.67	6	63.85	5
S+N+Zn+KCl	64.17	2	64.20	3	64.57	3	64.13	5	64.27	4
Mean	63.84		64.12		64.46		64.32		64.19	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	*		0.09		0.32		0.61			
Nutrients Spray (B)	**		0.14		0.40		0.76			
B within A	*		0.28		0.81					
A within B			0.27		0.78					

Moisture Content Grains, %										
No foliar fertilization	11.2	5	11.1	6	11.8	1	11.6	2	11.4	3
S (2% S)	11.4	3	11.3	4	11.3	5	11.3	5	11.3	5
N (2% Urea)	11.3	4	11.3	4	11.3	6	11.2	6	11.3	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	11.4	1	11.3	3	11.7	2	11.6	2	11.5	1
KCl 1%	11.1	6	11.4	2	11.4	4	11.6	1	11.4	4
S+N+Zn+KCl	11.4	1	11.4	1	11.6	3	11.5	4	11.5	1
Mean	11.3		11.3		11.5		11.5		11.4	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.03		0.09		1.00			
Nutrients Spray (B)	*		0.06		0.16		1.70			
B within A	N.S.		0.11		0.32					
A within B			0.11		0.30					
Date of Sowing:	10.11.2021				Date of Harvesting:		23.04.2022			

Table 6.34.2. North Western Plains Zone		SPL-9		Hisar		Quality		2021-22		
Nutrients foliar spray	Varieties								Mean	Rk
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk		
Fe Content Grains, ppm										
No foliar fertilization	39.03	2	37.50	2	37.53	5	35.50	6	37.39	4
S (2% S)	36.63	6	36.57	6	39.80	1	38.07	2	37.77	3
N (2% Urea)	38.07	4	36.77	4	37.67	4	35.63	5	37.03	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	38.13	3	38.80	1	38.33	3	36.27	4	37.88	2
KCl 1%	37.63	5	36.87	3	36.50	6	37.67	3	37.17	5
S+N+Zn+KCl	40.20	1	36.73	5	39.10	2	42.13	1	39.54	1
Mean	38.28		37.21		38.16		37.54		37.80	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.67		2.32		7.51			
Nutrients Spray (B)	N.S.		0.88		2.51		8.05			
B within A	N.S.		1.76		5.02					
A within B			1.74		4.97					
Zn Content Grains, ppm										
No foliar fertilization	46.83	1	38.67	4	45.00	2	39.27	6	42.44	4
S (2% S)	46.00	2	37.73	6	44.33	3	45.63	2	43.43	2
N (2% Urea)	43.03	4	43.70	2	43.00	4	45.53	3	43.82	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	38.73	5	46.33	1	40.53	5	40.27	5	41.47	6
KCl 1%	43.13	3	37.80	5	40.10	6	46.27	1	41.83	5
S+N+Zn+KCl	38.50	6	40.23	3	49.60	1	43.57	4	42.98	3
Mean	42.71		40.74		43.76		43.42		42.66	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	*		0.52		1.81		5.20			
Nutrients Spray (B)	N.S.		1.04		2.99		8.49			
B within A	**		2.09		5.97					
A within B			1.98		5.65					
Grains Protein, %										
No foliar fertilization	15.8	3	15.1	5	16.3	1	16.0	3	15.8	4
S (2% S)	16.0	1	15.2	4	16.0	3	15.8	4	15.8	5
N (2% Urea)	15.5	4	16.0	3	15.8	5	16.5	2	16.0	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	15.2	5	16.1	1	16.0	4	16.6	1	16.0	2
KCl 1%	15.0	6	15.1	6	14.9	6	15.7	5	15.1	6
S+N+Zn+KCl	15.9	2	16.1	1	16.1	2	15.6	6	15.9	3
Mean	15.6		15.6		15.8		16.0		15.8	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.20		0.69		5.40			
Nutrients Spray (B)	N.S.		0.27		0.78		5.96			
B within A	N.S.		0.54		1.55					
A within B			0.53		1.53					
Grains Hectoliter Weight, kg										
No foliar fertilization	72.42	6	74.39	2	73.62	3	73.55	3	73.50	3
S (2% S)	72.53	5	75.92	1	69.25	5	71.78	5	72.37	6
N (2% Urea)	74.43	3	71.45	6	73.44	4	73.60	2	73.23	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	74.73	2	73.85	5	74.35	2	71.51	6	73.61	2
KCl 1%	74.83	1	74.37	3	75.72	1	72.91	4	74.46	1
S+N+Zn+KCl	72.83	4	74.23	4	69.08	6	74.24	1	72.59	5
Mean	73.63		74.03		72.58		72.93		73.29	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.46		1.60		2.68			
Nutrients Spray (B)	N.S.		0.70		2.00		3.30			
B within A	N.S.		1.40		4.00					
A within B			1.36		3.88					

Starch Content Grains, %										
No foliar fertilization	63.20	5	64.13	3	63.20	4	63.77	3	63.58	3
S (2% S)	63.67	4	64.70	2	62.60	5	63.37	4	63.58	2
N (2% Urea)	64.17	3	62.63	6	63.90	2	63.10	5	63.45	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	64.63	1	63.37	5	63.67	3	62.50	6	63.54	4
KCl 1%	64.43	2	64.77	1	64.83	1	63.90	2	64.48	1
S+N+Zn+KCl	63.00	6	63.83	4	61.83	6	64.30	1	63.24	6
Mean	63.85		63.91		63.34		63.49		63.65	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.21		0.74		1.43			
Nutrients Spray (B)	N.S.		0.34		0.96		1.83			
B within A	N.S.		0.67		1.93					
A within B			0.65		1.86					
Moisture Content Grains, %										
No foliar fertilization	8.1	5	8.1	5	8.2	2	8.1	4	8.1	3
S (2% S)	8.1	4	8.1	3	8.0	5	8.1	5	8.1	4
N (2% Urea)	8.0	6	8.1	4	7.9	6	8.1	3	8.1	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	8.2	2	8.3	1	8.0	4	8.2	2	8.2	2
KCl 1%	8.2	1	8.2	2	8.2	1	8.2	1	8.2	1
S+N+Zn+KCl	8.2	2	8.1	6	8.2	2	7.8	6	8.1	4
Mean	8.1		8.2		8.1		8.1		8.1	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.07		0.23		3.45			
Nutrients Spray (B)	N.S.		0.06		0.17		2.53			
B within A	N.S.		0.12		0.34					
A within B			0.13		0.36					
Date of Sowing:	10.11.2021				Date of Harvesting:		15.04.2022			

Table 6.34.3. North Western Plains Zone											
SPL-9				Ludhiana				Quality		2021-22	
Nutrients foliar spray	Varieties										
	HD 3226	Rk	HI 1544	Rk	DBW 187	Rk	PBW 1 Zn	Rk	Mean	Rk	
Fe Content Grains, ppm											
No foliar fertilization	32.70	2	31.70	1	33.77	5	33.40	3	32.89	3	
S (2% S)	32.17	5	30.63	5	34.40	3	35.50	2	33.18	2	
N (2% Urea)	31.70	6	30.83	3	33.93	4	32.47	5	32.23	6	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	32.70	2	31.70	1	33.73	6	32.23	6	32.59	5	
KCl 1%	32.63	4	30.83	3	34.77	2	35.87	1	33.53	1	
S+N+Zn+KCl	32.97	1	30.40	6	35.33	1	32.63	4	32.83	4	
Mean	32.48		31.02		34.32		33.68		32.88		
	F. Test		SEm		CD (0.05)		CV (%)				
Variety (A)	*		0.62		2.13		7.95				
Nutrients Spray (B)	N.S.		0.64		1.82		6.70				
B within A	N.S.		1.27		3.64						
A within B			1.31		3.76						
Zn Content Grains, ppm											
No foliar fertilization	32.37	5	32.37	4	33.33	5	35.63	4	33.43	4	
S (2% S)	33.63	4	29.47	6	32.87	6	35.77	3	32.93	5	
N (2% Urea)	31.73	6	30.63	5	34.23	3	34.37	6	32.74	6	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	51.00	1	45.30	1	48.70	2	45.80	2	47.70	2	
KCl 1%	36.87	3	33.60	3	33.63	4	34.50	5	34.65	3	
S+N+Zn+KCl	49.00	2	44.33	2	50.43	1	48.57	1	48.08	1	
Mean	39.10		35.95		38.87		39.11		38.26		
	F. Test		SEm		CD (0.05)		CV (%)				
Variety (A)	**		0.26		0.89		2.85				
Nutrients Spray (B)	**		0.63		1.80		5.69				
B within A	N.S.		1.26		3.59						
A within B			1.18		3.36						
Grains Protein, %											
No foliar fertilization	13.2	5	12.5	6	13.0	6	12.7	6	12.9	6	
S (2% S)	13.3	3	12.8	3	13.1	5	12.8	5	13.0	4	
N (2% Urea)	13.5	2	13.2	1	14.0	2	13.0	2	13.5	2	
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	13.3	4	12.6	4	13.2	4	12.9	4	13.0	5	
KCl 1%	13.1	6	12.5	5	13.6	3	12.9	3	13.0	3	
S+N+Zn+KCl	13.6	1	13.2	1	14.1	1	13.5	1	13.6	1	
Mean	13.3		12.8		13.5		13.0		13.2		
	F. Test		SEm		CD (0.05)		CV (%)				
Variety (A)	N.S.		0.20		0.71		6.58				
Nutrients Spray (B)	**		0.10		0.29		2.69				
B within A	N.S.		0.20		0.58						
A within B			0.28		0.79						

Grains Hectoliter Weight, kg										
No foliar fertilization	74.41	6	74.73	6	76.19	5	74.30	6	74.91	6
S (2% S)	75.78	1	75.27	3	77.47	1	74.57	2	75.77	1
N (2% Urea)	74.71	5	75.18	5	76.45	3	74.48	3	75.21	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	75.56	2	75.49	1	77.04	2	74.44	5	75.63	2
KCl 1%	75.21	4	75.47	2	76.27	4	74.45	4	75.35	4
S+N+Zn+KCl	75.41	3	75.22	4	75.90	6	74.91	1	75.36	3
Mean	75.18		75.23		76.56		74.53		75.37	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	*		0.29		1.02		1.65			
Nutrients Spray (B)	N.S.		0.22		0.64		1.03			
B within A	N.S.		0.45		1.28					
A within B			0.50		1.44					
Grains Starch, %										
No foliar fertilization	63.57	6	63.93	6	63.73	6	64.13	6	63.84	6
S (2% S)	64.07	2	63.97	5	64.30	1	64.33	3	64.17	3
N (2% Urea)	63.80	4	64.40	4	64.00	5	64.37	2	64.14	5
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	63.87	3	64.70	2	64.10	2	64.23	5	64.23	2
KCl 1%	63.63	5	64.60	3	64.03	4	64.33	4	64.15	4
S+N+Zn+KCl	64.27	1	64.77	1	64.07	3	64.37	1	64.37	1
Mean	63.87		64.39		64.04		64.29		64.15	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.20		0.69		1.32			
Nutrients Spray (B)	N.S.		0.15		0.42		0.79			
B within A	N.S.		0.29		0.84					
A within B			0.33		0.95					
Grains Moisture, %										
No foliar fertilization	11.0	4	11.0	2	11.0	5	10.9	6	11.0	5
S (2% S)	11.0	3	11.0	2	11.3	1	10.9	5	11.1	3
N (2% Urea)	11.2	1	10.6	6	10.8	6	11.0	4	10.9	6
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	10.9	5	10.8	5	11.1	3	11.3	3	11.0	4
KCl 1%	11.2	2	11.0	4	11.1	3	11.3	2	11.1	1
S+N+Zn+KCl	10.8	6	11.1	1	11.2	2	11.4	1	11.1	2
Mean	11.0		10.9		11.1		11.1		11.0	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.09		0.31		3.44			
Nutrients Spray (B)	N.S.		0.10		0.28		3.09			
B within A	N.S.		0.20		0.56					
A within B			0.20		0.57					
Date of Sowing:	02.11.2021				Date of Harvesting:		14.04.2022			

Table 6.34.4. North Western Plains Zone SPL-9 Pantnagar Quality 2021-22

Nutrients foliar spray	HD 3226		HI 1544		DBW 187		PBW 1 Zn		Mean	Rk
	Rk		Rk		Rk		Rk			
Fe Content Grains, ppm										
No foliar fertilization	37.20	2	39.67	2	37.53	1	38.37	3	38.19	1
S (2% S)	36.70	5	39.97	1	35.43	4	38.97	1	37.77	2
N (2% Urea)	36.83	4	38.63	4	35.80	2	38.03	4	37.33	3
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	37.27	1	35.23	6	35.17	5	38.00	5	36.42	5
KCl 1%	37.20	2	37.53	5	35.80	2	38.50	2	37.26	4
S+N+Zn+KCl	34.37	6	39.07	3	34.43	6	36.57	6	36.11	6
Mean	36.59		38.35		35.69		38.07		37.18	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.71		2.46		8.11			
Nutrients Spray (B)	N.S.		0.86		2.46		8.04			
B within A	N.S.		1.72		4.93					
A within B			1.73		4.94					
Zn Content Grains, ppm										
No foliar fertilization	32.20	4	31.37	6	26.80	6	31.40	3	30.44	5
S (2% S)	33.37	2	35.60	2	37.60	1	31.33	4	34.48	2
N (2% Urea)	31.93	5	33.00	4	28.77	4	28.17	6	30.47	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	53.37	1	33.87	3	33.30	2	36.53	1	39.27	1
KCl 1%	30.93	6	31.67	5	27.23	5	30.23	5	30.02	6
S+N+Zn+KCl	32.87	3	38.80	1	29.00	3	33.50	2	33.54	3
Mean	35.78		34.05		30.45		31.86		33.03	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		1.45		5.01		18.58			
Nutrients Spray (B)	**		1.72		4.90		17.99			
B within A	N.S.		3.43		9.81					
A within B			3.45		9.86					



<b>Grains Protein, %</b>										
No foliar fertilization	14.6	6	13.2	5	14.2	3	14.4	4	14.1	5
S (2% S)	15.3	4	13.7	3	14.0	5	14.4	3	14.3	3
N (2% Urea)	15.5	3	13.9	1	14.8	1	14.9	1	14.8	1
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	15.0	5	12.7	6	13.3	6	14.2	5	13.8	6
KCl 1%	15.6	2	13.4	4	14.0	4	13.8	6	14.2	4
S+N+Zn+KCl	15.7	1	13.8	2	14.5	2	14.6	2	14.7	2
Mean	15.3		13.5		14.1		14.4		14.3	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	**		0.15		0.50		4.31			
Nutrients Spray (B)	N.S.		0.24		0.68		5.77			
B within A	N.S.		0.48		1.36					
A within B			0.46		1.31					
<b>Grains Starch, %</b>										
No foliar fertilization	64.30	1	64.80	2	64.10	3	64.57	2	64.44	2
S (2% S)	64.00	2	63.87	6	63.43	6	64.00	6	63.83	6
N (2% Urea)	63.87	3	64.20	5	63.77	4	64.13	5	63.99	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	63.67	5	65.50	1	64.63	1	64.40	4	64.55	1
KCl 1%	63.73	4	64.50	3	64.57	2	64.87	1	64.42	3
S+N+Zn+KCl	63.20	6	64.30	4	63.47	5	64.47	3	63.86	5
Mean	63.79		64.53		63.99		64.41		64.18	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	*		0.14		0.48		0.92			
Nutrients Spray (B)	N.S.		0.27		0.77		1.45			
B within A	N.S.		0.54		1.53					
A within B			0.51		1.45					
<b>Grains Moisture, %</b>										
No foliar fertilization	10.2	4	10.3	3	10.2	2	10.1	4	10.2	3
S (2% S)	10.2	4	10.6	1	10.2	5	10.1	4	10.3	1
N (2% Urea)	10.3	2	10.1	6	10.2	5	10.3	1	10.2	4
Zn (0.5% ZnSO <sub>4</sub> .7H <sub>2</sub> O)	10.1	6	10.2	4	10.3	1	10.2	2	10.2	5
KCl 1%	10.2	3	10.2	5	10.2	3	10.1	3	10.2	6
S+N+Zn+KCl	10.3	1	10.3	2	10.2	3	10.1	4	10.2	2
Mean	10.2		10.3		10.2		10.2		10.2	
	F. Test		SEm		CD (0.05)		CV (%)			
Variety (A)	N.S.		0.04		0.12		1.46			
Nutrients Spray (B)	N.S.		0.05		0.15		1.75			
B within A	N.S.		0.10		0.29					
A within B			0.10		0.29					
Date of Sowing:	21.11.2021		Date of Harvesting:				11.04.2022			

<b>Table 6.38.1. North Western Plains Zone</b>		<b>SPL-10</b>		<b>Gurdaspur</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
Control	36.59	265	34.10	40.49	98.60	83.00
Control + Bio NPK @2.5 ml/kg seed treatment	38.74	276	34.40	40.92	102.67	83.40
50% Rec. NPK	46.08	305	36.20	41.81	113.90	85.00
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	47.84	312	36.80	41.80	118.10	85.40
75% Rec. NPK	50.89	326	38.50	40.57	129.77	87.20
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	51.30	331	38.90	39.82	134.80	87.80
100% Rec NPK	53.78	344	40.54	38.59	146.90	89.50
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	55.77	349	40.63	39.30	150.67	90.60
Mean	47.62	313	37.51	40.41	124.43	86.49
CD (0.05)	1.86	9.05	1.22	2.23	8.18	1.08
CV (%)	2.72	2.01	2.27	3.84	4.57	0.87
Date of Sowing:	29.10.2021	Date of Harvesting:				

<b>Table 6.38.2. North Western Plains Zone</b>		<b>SPL-10</b>		<b>Hisar</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
Control	29.73	263	37.84	30.03	82.65	82.22
Control + Bio NPK @2.5 ml/kg seed treatment	31.90	280	37.95	30.09	88.44	86.00
50% Rec. NPK	42.93	350	37.13	33.31	114.63	93.00
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	44.12	362	37.07	32.90	119.05	95.00
75% Rec. NPK	50.95	412	36.56	33.88	134.35	98.22
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	52.11	413	36.64	34.44	137.76	100.11
100% Rec NPK	56.56	430	36.32	36.26	144.56	101.22
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	56.50	428	36.21	36.49	145.58	102.11
Mean	45.60	367	36.96	33.43	120.88	94.74
CD (0.05)	3.48	32.99	1.33	3.83	10.06	6.19
CV (%)	5.31	6.25	2.50	7.97	5.79	4.55
Date of Sowing:	11.11.2021	Date of Harvesting:				

<b>Table 6.38.3. North Western Plains Zone</b>		<b>SPL-10</b>		<b>Jammu</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
Control	35.10	359	36.08	27.12	78.98	99.23
Control + Bio NPK @2.5 ml/kg seed treatment	36.53	340	35.78	30.07	82.56	104.58
50% Rec. NPK	47.07	355	38.83	34.17	106.84	106.51
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	48.57	318	36.82	41.45	110.73	114.03
75% Rec. NPK	51.29	315	35.90	45.44	117.45	112.53
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	52.74	303	35.82	48.54	121.30	116.28
100% Rec NPK	53.86	307	35.74	49.55	124.42	118.01
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	55.27	353	37.59	41.70	128.23	119.91
Mean	47.55	331	36.57	39.75	108.81	111.39
CD (0.05)	2.17	25.38	0.90	3.38	4.98	2.44
CV (%)	3.17	5.33	1.71	5.91	3.18	1.53
Date of Sowing:	13.11.2021	Date of Harvesting:				

<b>Table 6.38.4. North Western Plains Zone</b>		<b>SPL-10</b>		<b>Karnal</b>		<b>2021-22</b>
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
Control	40.79	354	41.65	27.64	132.14	106.33
Control + Bio NPK @2.5 ml/kg seed treatment	43.73	354	40.35	30.86	132.14	107.23
50% Rec. NPK	63.02	457	41.56	33.36	186.11	113.40
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	60.04	420	39.83	35.91	176.98	110.80
75% Rec. NPK	61.31	545	37.76	30.57	192.46	111.60
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	61.03	412	38.50	38.72	183.73	110.47
100% Rec NPK	53.93	433	35.75	34.87	187.30	112.40
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	62.06	424	36.58	40.45	199.21	109.27
Mean	55.74	425	39.00	34.05	173.76	110.19
CD (0.05)	5.56	73.67	2.12	5.61	12.06	2.63
CV (%)	6.94	12.06	3.79	11.46	4.83	1.66
Date of Sowing:	03.11.2021	Date of Harvesting:				

<b>Table 6.38.5. North Western Plains Zone</b>		<b>SPL-10</b>	<b>Ludhiana</b>		<b>2021-22</b>	
Treatments	Yield, q/ha	Earhead/ sq.m.	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	Plant Ht., cm
Control	20.36	162	41.35	30.42	52.10	80.67
Control + Bio NPK @2.5 ml/kg seed treatment	20.69	163	41.27	30.76	53.14	81.33
50% Rec. NPK	39.84	207	37.99	50.66	106.53	99.00
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	41.88	208	38.56	52.63	107.93	100.33
75% Rec. NPK	44.32	235	37.22	50.87	115.87	102.00
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	45.50	235	37.34	51.79	118.58	105.00
100% Rec NPK	54.37	242	39.15	57.40	132.80	105.33
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	55.67	243	39.27	58.28	135.46	105.67
Mean	40.33	212	39.02	47.85	102.80	97.42
CD (0.05)	5.26	8.56	1.89	7.43	8.49	4.62
CV (%)	9.07	2.81	3.36	10.81	5.75	3.30
Date of Sowing:	01.11.2021	Date of Harvesting:				

<b>Table 6.39.1. North Eastern Plains Zone</b>		<b>SPL-10</b>	<b>IARI PUSA</b>		<b>2021-22</b>	
Treatments	Yield, q/ha	Earhead/ sqm	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	
Control	23.06	135	39.60	43.70	43.86	
Control + Bio NPK @2.5 ml/kg seed treatment	23.61	145	40.40	40.33	46.04	
50% Rec. NPK	33.91	155	40.70	53.95	74.44	
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	34.01	174	41.20	48.00	74.64	
75% Rec. NPK	37.96	180	41.53	50.61	85.70	
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	42.01	187	41.73	53.75	93.47	
100% Rec NPK	43.57	192	41.80	54.29	99.30	
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	44.69	199	41.83	53.66	101.79	
Mean	35.35	171	41.10	49.79	77.41	
CD (0.05)	3.29	8	2.51	7.04	8.16	
CV (%)	6.46	3	4.25	9.84	7.33	
Date of Sowing:	20.11.2021	Date of Harvesting:			05.04.2022	

<b>Table 6.39.2. North Eastern Plains Zone</b>		<b>SPL-10</b>	<b>RPCAU, PUSA</b>		<b>2021-22</b>	
Treatments	Yield, q/ha	Earhead/ sqm	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	
Control	27.55	197	33.00	42.41	91.00	
Control + Bio NPK @2.5 ml/kg seed treatment	31.50	201	34.00	46.27	93.00	
50% Rec. NPK	32.37	212	36.00	34.38	96.00	
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	33.83	212	38.00	41.94	97.00	
75% Rec. NPK	35.50	209	38.00	45.08	99.00	
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	36.33	211	39.00	44.25	101.00	
100% Rec NPK	38.17	211	39.00	46.55	109.33	
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	39.57	216	42.00	43.67	111.00	
Mean	34.35	209	37.37	43.07	99.67	
CD (0.05)	1.63	14	1.63	10.01	7.41	
CV (%)	3.30	5	3.04	16.16	5.17	
Date of Sowing:	03.12.2021	Date of Harvesting:			04.04.2022	

<b>Table 6.39.3. North Eastern Plains Zone</b>		<b>SPL-10</b>	<b>Varanasi</b>		<b>2021-22</b>	
Treatments	Yield, q/ha	Earhead/ sqm	1000 grains weight, g	Grains/ earhead	Biomass, q/ha	
Control	16.10	172	40.89	23.13	37.74	
Control + Bio NPK @2.5 ml/kg seed treatment	16.83	178	40.70	23.41	32.98	
50% Rec. NPK	24.68	157	40.82	38.58	55.42	
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	24.95	159	41.31	37.95	57.12	
75% Rec. NPK	29.61	182	40.89	39.87	73.44	
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	29.91	187	41.62	38.50	74.80	
100% Rec NPK	42.33	239	39.63	44.83	91.12	
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	43.45	244	40.97	43.61	87.04	
Mean	28.48	190	40.85	36.23	63.71	
CD (0.05)	1.39	19	1.05	4.13	8.06	
CV (%)	3.39	7	1.78	7.93	8.80	
Date of Sowing:	18.11.2021	Date of Harvesting:			05.04.2022	

<b>Table 6.40.1. Central Zone</b>		<b>SPL-10</b>			<b>Indore</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
Control	206	26.3	54.27	29.30	83.1	73.20
Control + Bio NPK @2.5 ml/kg seed treatment	198	27.3	54.03	29.17	84.3	66.87
50% Rec. NPK	266	30.6	55.30	45.07	93.9	108.97
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	272	31.9	55.53	48.00	96.6	117.27
75% Rec. NPK	327	31.1	53.43	54.07	97.1	126.40
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	326	31.3	54.10	54.77	97.0	128.80
100% Rec NPK	333	32.4	52.63	56.60	98.0	142.30
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	345	31.7	52.67	57.70	98.0	144.50
CD (0.05)	25.28	2.98	1.09	2.60	2.50	7.75
Date of Sowing	12.11.2021		Date of Harvesting		01.04.2022	

<b>Table 6.40.2. Central Zone</b>		<b>SPL-10</b>			<b>Junagadh</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
Control	293	22.5	37.77	25.04	52.9	79.76
Control + Bio NPK @2.5 ml/kg seed treatment	322	23.2	38.70	28.54	54.5	83.50
50% Rec. NPK	352	33.1	44.13	51.38	69.3	105.10
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	375	31.4	44.73	52.69	69.6	105.95
75% Rec. NPK	408	29.0	45.27	53.61	70.9	105.78
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	420	27.0	45.90	52.04	72.9	107.82
100% Rec NPK	442	26.5	46.67	54.52	73.2	111.05
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	452	25.7	47.30	54.87	75.2	111.56
CD (0.05)	25.12	4.52	0.20	5.76	2.33	5.62
Date of Sowing	18.11.2021		Date of Harvesting		09.03.2022	

<b>Table 6.40.3. Central Zone</b>		<b>SPL-10</b>			<b>Vijapur</b>	<b>2021-22</b>
Treatments	Earheads/ sqm	Grains/ Earhead	1000 grain weight, g	Yield, q/ha	Plant ht., cm	Biomass, q/ha
Control	262	11.2	51.39	14.08	65.1	44.00
Control + Bio NPK @2.5 ml/kg seed treatment	295	7.3	48.65	10.46	63.5	31.96
50% Rec. NPK	365	18.4	50.80	33.25	79.7	87.25
50% Rec NPK+ Bio NPK @2.5 ml/kg seed treatment	356	19.3	50.23	34.29	80.8	87.88
75% Rec. NPK	412	21.2	50.63	43.13	81.9	111.42
75% Rec. NPK + Bio NPK @2.5 ml/kg seed treatment	392	21.9	51.37	43.88	79.9	110.83
100% Rec NPK	449	22.9	50.27	51.63	86.7	126.00
100% Rec NPK + Bio NPK @2.5 ml/kg seed treatment	514	20.8	48.80	52.04	86.9	126.42
CD (0.05)	70.23	3.39	1.99	3.39	4.66	7.89
Date of Sowing	16.11.2021		Date of Harvesting		17.03.2022	

## METEOROLOGICAL INFORMATION: 2021-2022

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
<b>NORTHERN HILLS ZONE</b>								
<b>ALMORA</b>	<b>Latitude 29<sup>o</sup>36' N</b>		<b>Longitude 79<sup>o</sup>40' E</b>		<b>Height above MSL 1213 m</b>			
41 (08-14 Oct)	26.8	8.9			42.3			
42 (15-21 Oct)	24.8	5.4			-			
43 (22-28 Oct)	24.6	5.1			-			
44 (29-04 Nov)	24.1	4.1			-			
45 (05-11 Nov)	24.6	3.9			-			
46 (12-18 Nov)	22.2	2.6			-			
47 (19-25 Nov)	20.8	4.4			-			
48 (26-02 Dec)	19.7	1.6			0.1			
49 (03-09 Dec)	18.1	-2.9			-			
50 (10-16 Dec)	16.3	1.1			-			
51 (17-23 Dec)	18.2	2.0			0.3			
52 (24-31 Dec)	15.6	5.2			3.0			
1 (01-07 Jan)	17.4	2.2			5.9			
2 (08-14 Jan)	12.6	2.9			0.3			
3 (15-21 Jan)	15.4	0.6			1.7			
4 (22-28 Jan)	16.9	2.6			4.9			
5 (29-04 Feb)	20.7	3.1			1.1			
6 (05-11 Feb)	20.7	2.1			-			
7 (12-18 Feb)	20.6	4.2			-			
8 (19-25 Feb)	25.1	5.9			1.8			
9 (26-04 Mar)	29.3	11.6			-			
10 (05-11 Mar)	29.3	9.2			-			
11 (12-18 Mar)	30.1	7.4			-			
12 (19-25 Mar)	31.1	7.4			-			
13 (26-01 Apr)	32.0	11.6			-			
14 (02-08 Apr)	33.1	12.0			-			
15 (09-15 Apr)	34.0	12.9			-			
16 (16-22 Apr)	32.9	16.6			0.3			
17 (23-29 Apr)	30.5	20.2			-			
18 (30-06 May)	33.0	17.7			3.7			
<b>BAJAURA</b>	<b>Latitude 31<sup>o</sup>48' N</b>		<b>Longitude 77<sup>o</sup>00' E</b>		<b>Height above MSL 1090 m</b>			
40 (01-07 Oct)	30.0	14.3	81	46	-	16.3		
41 (08-14 Oct)	31.1	10.6	82	36	-	18.3		
42 (15-21 Oct)	26.6	8.4	86	53	43.8	14.7		
43 (22-28 Oct)	24.1	7	89	46	7.0	13.1		
44 (29-04 Nov)	24.4	3.4	90	46	-	13.7		
45 (05-11 Nov)	25.1	1.6	93	34	-	11.8		
46 (12-18 Nov)	24.0	-0.2	91	31	-	10.2		
47 (19-25 Nov)	24.4	-0.7	92	25	-	11.1		
48 (26-02 Dec)	21.1	-0.3	88	37	-	8.9		
49 (03-09 Dec)	17.2	3.5	90	51	22.5	9.2		
50 (10-16 Dec)	18.8	-2.3	92	45	-	9.2		
51 (17-23 Dec)	16.8	-1.5	89	39	0.7	8.8		
52 (24-31 Dec)	16.1	-1.3	91	47	1.2	8.3		
1 (01-07 Jan)	15.9	1.6	86	53	50.2	7.9		
2 (08-14 Jan)	13.3	0.1	90	54	32.8	7		
3 (15-21 Jan)	16.6	0.5	91	40	3.3	8.3		
4 (22-28 Jan)	13.8	1.5	93	56	28.8	8.8		
5 (29-04 Feb)	16	-0.1	92	63	20.2	8.1		

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
6 (05-11 Feb)	15.4	0.4	91	54	16.2	11.3		
7 (12-18 Feb)	20.5	-1.5	90	46	-	14.4		
8 (19-25 Feb)	18	1.9	89	54	29.1	15.2		
9 (26-04 Mar)	17.1	2.1	88	52	30.8	13		
10 (05-11 Mar)	23.8	3.5	88	41	-	14.9		
11 (12-18 Mar)	30	5.4	84	36	-	21.9		
12 (19-25 Mar)	29.6	6	81	22	1.1	15.8		
13 (26-01 Apr)	30.2	5	80	16	-	21.9		
14 (02-08 Apr)	30.8	5.9	78	17	-	22.6		
15 (09-15 Apr)	31.7	8.3	77	23	4.2	21.5		
16 (16-22 Apr)	30.2	7.1	80	25	1.1	19.9		
17 (23-29 Apr)	31.8	7.7	71	23	-	29.3		
18 (30-06 May)	30.9	10.8	74	37	12.7	26.2		
19 (7-13 May)	31.5	11.9	75	34	4.7	24.9		
20 (14-20 May)	34.2	12.8	75	29	7.3	24.9		
21 (21-27 May)	29.6	11.3	77	42	29.2	22.4		
<b>KHUDWANI</b>	<b>Latitude 34<sup>o</sup> N</b>		<b>Longitude 74<sup>o</sup> E</b>			<b>Height above MSL 1590 m</b>		
40 (01-07 Oct)	24.4	11.6			2.6			16.3
41 (08-14 Oct)	21.3	7.5			2.6			15.9
42 (15-21 Oct)	18.7	7.1			5.5			13.4
43 (22-28 Oct)	12	3.6			10.5			10.6
44 (29-04 Nov)	15.3	1.8			0.1			13.3
45 (05-11 Nov)	13.3	1.9			0.2			11.4
46 (12-18 Nov)	13.8	-0.5			0.1			12.3
47 (19-25 Nov)	13.5	-1			0.1			11.8
48 (26-02 Dec)	12	-1.2			-			10.8
49 (03-09 Dec)	10.2	-1.1			1.3			9.7
50 (10-16 Dec)	7.9	-3.7			-			9.7
51 (17-23 Dec)	8.2	-4.2			0.1			10
52 (24-31 Dec)	5.9	-2.2			0.4			8.1
1 (01-07 Jan)	3.4	-1.5			4.8			5.9
2 (08-14 Jan)	4.7	-3.7			0.7			8.7
3 (15-21 Jan)	4.5	-2.2			-			7.8
4 (22-28 Jan)	5.2	-1.9			1.8			8.7
5 (29-04 Feb)	7.7	-3.1			0.3			11.3
6 (05-11 Feb)	8.4	-2.1			0.2			11.8
7 (12-18 Feb)	11	-2.2			-			14
8 (19-25 Feb)	7.4	-0.9			5.2			11.6
9 (26-04 Mar)	9.3	-0.1			3.6			13.4
10 (05-11 Mar)	14.3	2.9			1.8			15.5
11 (12-18 Mar)	21.5	5.7			0.1			19.3
12 (19-25 Mar)	17.6	5.7			2.5			17.5
13 (26-01 Apr)	23	6			0.1			22
14 (02-08 Apr)	23.5	7.8			0.3			22
15 (09-15 Apr)	21.3	7.7			1.8			21.1
16 (16-22 Apr)	18.6	8.2			2.6			18.2
17 (23-29 Apr)	20.5	8.7			3.0			21
<b>MALAN</b>	<b>Latitude 31°37' N</b>		<b>Longitude 76°2' E</b>			<b>Height above MSL 950 m</b>		
40 (01-07 Oct)	31.9	16.2	80.9	75.9	58.8			
41 (08-14 Oct)	32	14.7	80.7	75.4	-			
42 (15-21 Oct)	31.8	13.5	80.7	69	2.4			
43 (22-28 Oct)	31	12.9	77.4	69.6	18.4			
44 (29-04 Nov)	28.4	12.6	79.6	72.1	-			
45 (05-11 Nov)	27.2	12	76	70.3	-			
46 (12-18 Nov)	26.5	7.1	76.4	69.1	-			
47 (19-25 Nov)	26.9	8.9	70	63.3	-			
48 (26-02 Dec)	25.8	8.3	74.7	63	-			

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
49 (03-09 Dec)	24.1	8.1	70.7	66.7	-			
50 (10-16 Dec)	24.6	7.8	71.7	66.6	-			
51 (17-23 Dec)	24.8	7.58	71.1	65	-			
52 (24-31 Dec)	24.5	6.1	67.6	64.1	10.3			
1 (01-07 Jan)	22.9	5.6	71.1	67.9	54.1			
2 (08-14 Jan)	22.2	5.6	66.9	62.6	32.8			
3 (15-21 Jan)	22.8	5.8	71	65.4	6.21			
4 (22-28 Jan)	22.2	5.5	71.4	66.3	56.8			
5 (29-04 Feb)	23.3	6	72.1	68.3	43			
6 (05-11 Feb)	26.2	7.8	74.9	70.9	-			
7 (12-18 Feb)	27.5	7.6	77.9	74.7	-			
8 (19-25 Feb)	26	7.4	76.4	72.6	16.4			
9 (26-04 Mar)	26.9	8.9	77.7	74	20.6			
10 (05-11 Mar)	27.5	9.1	79.3	74.7	-			
11 (12-18 Mar)	28.8	9.9	81.3	75.3	-			
12 (19-25 Mar)	29.5	9.7	81.7	75.3	-			
13 (26-01 Apr)	31.1	10.3	81.7	76.6	-			
14 (02-08 Apr)	33.3	11.7	82.3	75.7	-			
15 (09-15 Apr)	33.8	13.4	82.1	77	1.3			
16 (16-22 Apr)	33.5	13.9	81.9	74.9	-			
17 (23-29 Apr)	33.9	14.6	82.4	76.7	-			
18 (30-06 May)	32.7	14	81.3	76.1	5.6			
19 (7-13 May)	29.6	13.7	76.4	67.7	9.1			
20 (14-20 May)	33.5	15	82.3	78	6.4			
<b>SHIMLA</b>	<b>Latitude 32<sup>o</sup>1' N</b>		<b>Longitude 77<sup>o</sup>6' E</b>		<b>Height above MSL 2206 m</b>			
40 (01-07 Oct)	23.4	14.7	79.7	70.4	-			
41 (08-14 Oct)	24.5	13.9	60.7	50.4	-			
42 (15-21 Oct)	23.2	13	73.5	62.1	24.1			
43 (22-28 Oct)	20.4	8.8	77.4	62.8	15.9			
44 (29-04 Nov)	18.9	8.5	55.5	48.1	2.0			
45 (05-11 Nov)	18.6	9.1	44.5	33.4	-			
46 (12-18 Nov)	18.5	7.3	62.2	43	-			
47 (19-25 Nov)	19.5	8.7	57	28.4	-			
48 (26-02 Dec)	16.7	6.2	53	38.1	-			
49 (03-09 Dec)	15.1	5.1	76.4	72.2	13.0			
50 (10-16 Dec)	14.4	3.8	56.1	39.7	-			
51 (17-23 Dec)	13.4	3.9	49.7	34.2	-			
52 (24-31 Dec)	12.4	2.7	63.3	54.2	-			
1 (01-07 Jan)	12.5	4.1	70.5	54.8	31.7			
2 (08-14 Jan)	10.1	0.6	84	72	86.1			
3 (15-21 Jan)	13.5	3.8	66.7	52.8	2.6			
4 (22-28 Jan)	6.9	0.6	80.7	76.5	33.5			
5 (29-04 Feb)	11.7	3.7	62.1	49.2	23.1			
6 (05-11 Feb)	12.5	2.4	55.2	44.2	35.8			
7 (12-18 Feb)	14.5	4.6	52.2	33.8	-			
8 (19-25 Feb)	15.2	4	59.1	50.1	7.0			
9 (26-04 Mar)	15.6	4.2	72.4	63.8	14.3			
10 (05-11 Mar)	19.8	9.5	56.4	42.7	-			
11 (12-18 Mar)	24.3	14.3	55	34.1	-			
12 (19-25 Mar)	23.9	14	47.4	40.2	-			
13 (26-01 Apr)	24.9	14.7	37.2	32.8	-			
14 (02-08 Apr)	25.4	15.2	41.7	32.8	-			
15 (09-15 Apr)	26.9	16.2	55.7	45.8	-			
16 (16-22 Apr)	25.9	15.1	39.9	26.8	-			
17 (23-29 Apr)	26.3	16	41.5	30.1	-			
18 (30-06 May)	25.8	14	60.8	48	73.9			
19 (7-13 May)	25.4	16.1	67.2	51.2	4.8			

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
20 (14-20 May)	29	17.3	46.4	33	9.8			
21 (21-27 May)	24.4	12.3	65.5	58.4	68.1			

### NORTH WESTERN PLAINS ZONE

DELHI	Latitude 28 <sup>o</sup> 40' N		Longitude 70 <sup>o</sup> 79' E			Height above MSL 163.4 m		
40(01-07 Oct)	34.5	24.8	90.6	61.7	35.4	26.7	2.6	7.5
41(08-14 Oct)	34.9	20.5	88.3	48.1	-	29.6	2.9	8.7
42(15-21 Oct)	31.1	18.7	88.4	63.1	54.7	24.7	3.5	5.8
43(22-28 Oct)	29.8	15.9	86.6	61.4	37.0	23.8	3.0	8.1
44(29-04 Nov)	29.4	13.6	92.6	55.1	-	23.5	2.0	7.2
45(05-11 Nov)	28.1	12.0	93.4	50.3	-	16.7	1.7	2.8
46(12-18 Nov)	26.3	9.3	90.9	50.6	-	16.0	1.2	3.7
47(19-25 Nov)	26.5	9.6	88.1	57.0	-	17.9	1.9	5.8
48(26-02 Dec)	25.4	10.0	92.6	54.1	-	13.9	1.3	4.0
49(03-09 Dec)	23.7	10.3	90.1	64.5	2.0	14.8	1.9	4.1
50(10-16 Dec)	22.2	6.2	88.0	60.7	-	12.1	1.3	4.4
51(17-23 Dec)	19.6	4.4	91.1	56.8	-	11.3	3.2	5.3
52(24-31 Dec)	20.8	6.9	93.9	74.9	7.6	10.5	1.5	1.6
1(01-07 Jan)	19.9	7.2	93.0	76.3	11.8	11.4	2.2	3.2
2(08-14 Jan)	17.1	8.5	93.3	76.3	96.8	10.9	3.8	1.5
3(15-21 Jan)	15.7	7.5	92.0	74.5	-	10.8	2.7	1.2
4(22-28 Jan)	15.5	7.4	93.3	81.1	33.3	8.8	3.7	1.3
5(29-04 Feb)	19.8	7.4	90.3	71.6	1.8	13.7	5.3	5.5
6(05-11 Feb)	21.1	7.5	91.0	65.3	10.8	15.4	2.6	5.6
7(12-18 Feb)	24.6	6.9	90.0	36.9	-	25.3	2.8	8.7
8(19-25 Feb)	25.3	10.5	91.0	39.6	15.0	23.2	4.8	6.7
9(26-04 Mar)	25.5	11.0	83.3	46.0	2.4	22.9	4.6	8.1
10(05-11 Mar)	27.9	13.0	87.7	37.0	-	23.8	4.3	7.6
11(12-18 Mar)	32.4	16.5	83.1	43.4	-	33.9	3.9	8.4
12(19-25 Mar)	35.8	18.3	75.6	44.9	-	38.6	3.7	7.7
13(26-01 Apr)	37.4	16.8	68.1	24.1	-	37.9	4.3	9.0
14(02-08 Apr)	39.1	16.8	69.0	10.6	-	42.4	3.6	9.7
15(09-15 Apr)	40.8	20.1	64.7	13.3	-	44.9	3.6	8.0
16(16-22 Apr)	39.9	21.3	68.6	17.1	-	47.4	4.2	8.0
17(23-29 Apr)	40.4	21.0	56.2	19.5	-	46.0	4.9	9.2
18(30-06 May)	39.9	24.4	68.6	40.2	14.8	54.7	5.4	6.0
19(07-13 May)	39.5	25.9	71.0	33.9	-	51.2	4.8	7.9
20 (14-20 May)	43.3	26.3	68.4	24.0	-	53.3	5.0	7.5
21 (21-27 May)	36.7	21.8	81.3	43.2	54.0	40.2	6.2	6.6
GURDASPUR	Latitude 32 <sup>o</sup> 05' N		Longitude 75 <sup>o</sup> 42' E			Height above MSL 221.9 m		
40(01-07 Oct)	32.7	21.7	78.3	56.3	13.8	23.5	2.3	4.5
41(08-14 Oct)	33.2	20.4	83.0	53.3	-	27.2	2.2	5.6
42(15-21 Oct)	30.6	17.5	90.7	63.6	3.1	21.8	1.9	4.7
43(22-28 Oct)	28.0	15.4	88.0	68.7	43.5	21.2	4.3	5.8
44(29-04 Nov)	27.2	13.6	85.3	63.6	-	23.7	3.0	6.1
45(05-11 Nov)	27.6	11.6	89.1	61.9	-	24.4	1.4	7.0
46(12-18 Nov)	26.4	9.5	92.7	62.0	-	21.3	1.0	6.8
47(19-25 Nov)	25.8	7.9	91.6	58.9	-	21.0	1.6	5.9
48(26-02 Dec)	24.3	9.1	90.7	49.4	-	19.4	1.5	3.4
49(03-09 Dec)	23.9	9.1	87.0	51.3	-	16.8	1.8	5.1
50(10-16 Dec)	21.6	5.4	92.9	57.6	-	17.1	1.5	3.3
51(17-23 Dec)	17.5	3.9	95.0	72.0	0.1	10.6	1.7	3.2
52(24-31 Dec)	19.8	6.7	93.8	64.5	0.1	16.8	1.5	4.9
1(01-07 Jan)	16.4	9.2	91.4	83.3	81.2	10.4	3.5	1.7
2(08-14 Jan)	16.8	7.9	94.4	75.4	88.1	8.9	2.4	1.9
3(15-21 Jan)	13.6	6.8	96.7	80.4	1.9	6.8	2.7	0.0
4(22-28 Jan)	15.3	7.3	93.6	79.9	36.0	8.7	2.5	1.9



Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
5(29-04 Feb)	15.5	6.4	94.3	76.7	27.8	13.3	2.9	3.1
6(05-11 Feb)	19.8	8.0	91.0	66.1	-	17.2	2.4	6.1
7(12-18 Feb)	22.5	7.6	87.7	58.1	-	23.6	2.0	7.9
8(19-25 Feb)	22.7	9.1	85.3	67.0	-	21.5	4.9	4.7
9(26-04 Mar)	22.0	9.3	83.9	67.3	17.9	15.6	3.1	5.1
10(05-11 Mar)	26.5	12.4	74.4	59.9	-	24.7	2.2	5.3
11(12-18 Mar)	26.4	15.7	77.6	61.4	-	28.8	2.5	7.0
12(19-25 Mar)	33.0	17.5	83.7	57.0	-	25.1	2.6	6.6
13(26-01 Apr)	34.2	16.0	78.3	54.1	-	24.7	2.6	7.4
14(02-08 Apr)	36.1	17.6	70.7	43.0	-	31.0	2.3	7.6
15(09-15 Apr)	37.9	20.4	57.0	39.6	-	37.4	2.8	5.1
16(16-22 Apr)	37.4	20.8	61.6	41.4	-	40.5	4.0	6.1
17(23-29 Apr)	39.3	21.2	60.1	38.4	-	40.4	3.4	7.2
18(30-06 May)	37.7	23.6	55.3	41.3	10.4	36.9	5.5	4.2
19(07-13 May)	38.2	26.5	53.5	46.3	-	26.7	4.9	6.3
<b>HISAR</b>	<b>Latitude 29°10' N</b>		<b>Longitude 75° 46' E</b>			<b>Height above MSL 215.2 m</b>		
40(01-07 Oct)	33.3	25.3	93.0	66.0	5.5	3.8	3.1	6.7
41(08-14 Oct)	34.8	21.6	86.0	37.0	-	3.5	1.9	8.2
42(15-21 Oct)	31.3	18.4	86.0	50.0	-	2.2	2.8	6.3
43(22-28 Oct)	29.8	15.9	86.0	44.0	-	3.6	4.4	7.8
44(29-04 Nov)	30.4	13.5	83.0	34.0	-	2.5	3.3	7.0
45(05-11 Nov)	28.9	11.8	90.0	37.0	-	1.6	1.0	4.3
46(12-18 Nov)	27.4	9.1	92.0	33.0	-	1.7	1.0	4.2
47(19-25 Nov)	26.6	7.9	89.0	30.0	-	1.6	1.8	7.1
48(26-02 Dec)	25.3	9.2	95.0	48.0	-	1.5	1.9	5.1
49(03-09 Dec)	23.3	8.5	99.0	49.0	-	1.2	2.0	5.0
50(10-16 Dec)	22.2	5.7	95.0	42.0	-	1.4	1.7	6.5
51(17-23 Dec)	18.9	3.3	94.0	45.0	-	1.2	2.3	5.2
52(24-31 Dec)	20.3	6.4	93.0	56.0	1.2	1.3	2.9	4.0
1(01-07 Jan)	18.5	8.6	99.0	63.0	16.5	0.9	3.2	3.7
2(08-14 Jan)	15.9	8.2	96.0	79.0	23.5	1.3	4.7	1.9
3(15-21 Jan)	14.0	6.6	96.0	79.0	1.4	0.7	2.7	0.7
4(22-28 Jan)	15.5	6.6	99.0	69.0	22.6	1.7	4.4	2.6
5(29-04 Feb)	20.0	6.5	97.0	63.0	-	1.1	4.7	5.6
6(05-11 Feb)	21.5	7.7	96.0	48.0	5.8	1.4	3.1	6.8
7(12-18 Feb)	24.8	6.4	97.0	48.0	-	2.0	2.3	8.6
8(19-25 Feb)	24.8	9.5	87.0	46.0	-	2.8	5.1	7.7
9(26-04 Mar)	24.6	9.4	95.0	49.0	-	2.5	5.4	7.9
10(05-11 Mar)	27.1	10.5	93.0	43.0	-	3.0	3.1	7.3
11(12-18 Mar)	32.7	14.7	91.0	40.0	-	3.3	2.9	8.1
12(19-25 Mar)	35.0	17.2	85.0	30.0	-	3.7	4.3	7.4
13(26-01 Apr)	37.5	15.6	73.0	17.0	-	5.1	3.3	8.3
14(02-08 Apr)	39.3	15.2	76.0	28.0	-	6.0	3.2	8.8
15(09-15 Apr)	41.1	19.8	68.0	40.0	-	6.6	4.4	7.8
16(16-22 Apr)	40.2	21.2	71.0	42.0	1.5	8.1	5.6	8.2
17(23-29 Apr)	40.1	20.0	63.0	28.0	-	7.1	4.1	9.2
18(30-06 May)	41.5	24.3	59.0	25.0	-	7.5	6.4	8.3
<b>JAMMU</b>	<b>Latitude 32°44' N</b>		<b>Longitude 74°54' E</b>			<b>Height Above MSL 356 m</b>		
40(01-07 Oct)	32.7	22.4	85.9	53.6	5.2	35.6	1.4	7.3
41(08-14 Oct)	33.9	20.1	77.4	43.6	-	43.8	2.3	8.4
42(15-21 Oct)	32.6	18.0	80.4	45.9	-	41.8	1.9	8.1
43(22-28 Oct)	26.4	14.3	79.4	54.1	102.0	28.8	5.6	6.6
44(29-04 Nov)	27.8	12.1	77.9	37.3	-	33.6	2.4	7.5
45(05-11 Nov)	28.1	10.3	88.9	33.7	-	33.6	1.1	8.1
46(12-18 Nov)	26.5	8.6	89.9	34.9	-	31.8	1.0	7.5
47(19-25 Nov)	25.7	7.2	89.3	32.0	-	23.2	1.1	7.4
48(26-02 Dec)	24.4	6.9	94.9	46.4	-	18.8	0.9	5.9

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
49(03-09 Dec)	24.8	8.6	89.0	45.4	-	20.0	1.7	6.4
50(10-16 Dec)	20.8	4.5	90.9	45.7	-	16.2	1.0	3.4
51(17-23 Dec)	18.5	2.8	95.0	49.6	-	10.4	1.8	4.7
52(24-31 Dec)	19.7	3.9	91.9	49.0	0.8	12.1	1.2	4.4
1(01-07 Jan)	16.6	7.9	88.9	76.3	55.4	5.8	2.8	1.3
2(08-14 Jan)	16.8	7.2	93.4	68.4	110.0	6.0	4.3	4.6
3(15-21 Jan)	12.9	9.0	91.4	86.1	8.2	4.4	2.6	0.0
4(22-28 Jan)	16.7	6.9	91.6	68.0	17.4	4.1	3.4	3.4
5(29-04 Feb)	17.9	6.1	96.1	66.0	10.2	6.6	2.5	4.1
6(05-11 Feb)	19.9	6.1	92.3	53.4	-	9.6	2.3	6.0
7(12-18 Feb)	22.6	6.0	91.9	50.3	-	16.4	1.7	7.3
8(19-25 Feb)	22.9	6.7	89.6	53.3	13.2	16.8	3.0	3.2
9(26-04 Mar)	22.4	8.6	86.6	52.6	23.0	14.6	3.9	5.7
10(05-11 Mar)	26.5	10.4	90.4	48.1	-	25.2	2.7	5.5
11(12-18 Mar)	31.6	14.1	90.0	48.0	-	36.0	2.1	7.2
12(19-25 Mar)	33.7	15.8	76.9	37.4	-	43.2	2.4	7.7
13(26-01 Apr)	35.4	14.4	68.0	33.3	-	44.4	2.0	7.9
14(02-08 Apr)	36.9	15.4	58.0	22.4	-	53.0	1.9	6.9
15(09-15 Apr)	38.4	18.4	59.0	19.1	-	65.0	3.1	6.5
16(16-22 Apr)	37.3	18.5	51.6	21.1	4.6	65.4	2.8	6.7
17(23-29 Apr)	38.9	20.0	44.3	16.4	-	76.0	5.4	9.2
18(30-06 May)	36.8	21.5	55.0	25.1	2.0	71.0	4.9	5.1
19(07-13 May)	39.6	21.9	53.4	26.9	2.0	76.4	3.8	7.1
<b>KARNAL</b>	<b>Latitude 29<sup>o</sup>43' N</b>		<b>Longitude 76<sup>o</sup>58' E</b>			<b>Height above MSL 245 m</b>		
44(29-04 Nov)	28.8	14.3	78.4	38.9	-	2.5	1.0	7.7
45(05-11 Nov)	28.8	11.9	93.9	30.3	-	2.3	0.5	7.3
46(12-18 Nov)	27.6	09.9	92.1	32.3	-	2.0	0.3	7.4
47(19-25 Nov)	26.7	09.5	91.6	35.3	-	1.8	0.6	7.4
48(26-02 Dec)	24.6	10.5	96.0	50.9	-	1.2	0.4	5.4
49(03-09 Dec)	23.8	10.7	95.3	46.9	-	1.3	0.7	5.3
50(10-16 Dec)	22.0	07.2	97.9	58.4	-	1.1	0.5	5.5
51(17-23 Dec)	18.1	04.9	97.9	69.6	-	0.9	0.6	4.5
52(24-31 Dec)	20.4	06.5	98.4	70.3	1.2	1.2	0.7	3.4
1(01-07 Jan)	18.4	08.6	98.1	77.3	13.6	1.0	1.2	3.7
2(08-14 Jan)	15.1	09.5	100.0	91.9	43.3	0.6	2.5	0.5
3(15-21 Jan)	12.6	07.6	98.0	87.1	1.2	0.6	0.2	0.2
4(22-28 Jan)	13.5	07.9	97.3	85.1	35.0	0.5	2.4	0.7
5(29-04 Feb)	17.3	07.5	99.6	70.9	20.4	1.2	3.6	4.5
6(05-11 Feb)	19.3	07.3	96.6	58.6	-	1.1	1.0	5.2
7(12-18 Feb)	22.7	06.1	98.7	46.9	-	2.1	0.9	8.8
8(19-25 Feb)	23.7	09.8	92.6	50.6	-	2.5	2.8	6.7
9(26-04 Mar)	23.7	10.1	96.1	49.1	9.5	2.3	2.9	7.8
10(05-11 Mar)	27.0	12.3	94.9	47.0	-	2.9	1.3	7.7
11(12-18 Mar)	30.5	16.5	96.0	53.0	-	3.3	1.1	7.9
12(19-25 Mar)	33.6	17.3	91.0	38.7	-	4.2	1.1	7.8
13(26-01 Apr)	36.3	15.8	77.6	20.9	-	5.4	1.4	8.2
14(02-08 Apr)	38.6	16.5	62.3	13.1	-	6.6	1.3	8.6
15(09-15 Apr)	40.6	19.4	58.1	14.9	-	6.7	1.6	6.8
16(16-22 Apr)	39.1	20.8	49.3	16.3	-	8.1	2.0	7.5
17(23-29 Apr)	39.9	21.3	46.7	14.0	-	8.9	2.3	8.7
18(30-06 May)	38.5	24.7	65.6	33.4	30.8	8.0	5.5	4.3
19(07-13 May)	37.5	25.3	62.9	38.1	-	7.2	5.4	8.6
20 (14-20 May)	40.4	25.8	60.4	29.0	-	7.9	3.8	7.5
21 (21-27 May)	34.4	21.6	74.0	44.7	54.2	6.2	5.5	7.4
<b>LUDHIANA</b>	<b>Latitude 30<sup>o</sup>54' N</b>		<b>Longitude 75<sup>o</sup>52' E</b>			<b>Height above MSL 247 m</b>		
40(01-07 Oct)	32.8	24.4	87.1	56.0	6.6	21.4	2.5	8.7
41(08-14 Oct)	33.7	21.6	85.1	40.1	-	23.2	2.4	9.5

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
42(15-21 Oct)	31.8	19.2	86.7	39.7	-	18.4	2.7	7.1
43(22-28 Oct)	27.7	15.6	86.4	42.3	31.0	21.0	4.5	8.8
44(29-04 Nov)	28.7	15.0	80.9	31.3	-	22.4	4.0	7.1
45(05-11 Nov)	28.4	12.0	91.6	29.7	-	13.6	1.4	6.3
46(12-18 Nov)	26.6	9.6	93.0	29.0	-	10.8	1.3	7.0
47(19-25 Nov)	26.0	8.5	92.4	31.1	-	11.2	2.1	8.2
48(26-02 Dec)	23.8	9.6	94.0	43.3	-	8.0	1.4	5.0
49(03-09 Dec)	24.5	9.8	92.6	45.4	-	9.5	1.7	6.0
50(10-16 Dec)	20.8	6.1	96.1	49.7	-	8.2	1.3	4.5
51(17-23 Dec)	18.4	5.1	95.3	48.3	-	7.4	2.3	6.1
52(24-31 Dec)	19.1	4.9	96.7	52.4	-	6.2	1.4	5.2
1(01-07 Jan)	17.6	8.8	93.0	68.0	51.6	10.2	4.4	2.7
2(08-14 Jan)	15.5	9.7	95.4	83.1	47.8	7.2	3.4	2.2
3(15-21 Jan)	13.6	8.3	92.7	76.6	0.8	4.6	2.2	0.1
4(22-28 Jan)	14.6	8.1	95.9	76.4	13.2	5.0	4.6	2.5
5(29-04 Feb)	17.6	7.5	94.3	62.0	31.0	8.2	3.7	4.4
6(05-11 Feb)	19.9	7.8	93.1	49.0	-	9.6	2.1	8.5
7(12-18 Feb)	23.4	7.2	94.1	42.4	-	13.0	1.6	9.0
8(19-25 Feb)	23.5	10.3	85.9	41.0	3.4	18.6	5.9	7.5
9(26-04 Mar)	21.9	10.4	89.8	54.2	9.1	12.0	3.3	7.9
10(05-11 Mar)	27.2	13.1	91.4	40.1	-	19.0	2.6	8.4
11(12-18 Mar)	31.8	17.4	90.0	45.7	-	27.0	3.1	9.5
12(19-25 Mar)	33.6	19.0	82.7	32.6	-	27.8	2.6	9.4
13(26-01 Apr)	35.6	17.1	79.4	22.7	-	31.4	2.4	10.5
14(02-08 Apr)	38.3	17.7	72.7	13.7	-	42.0	2.6	10.8
15(09-15 Apr)	39.9	21.5	61.4	16.0	-	47.8	3.1	7.9
16(16-22 Apr)	38.3	21.6	49.9	18.7	-	47.2	3.9	8.9
<b>PANTNAGAR</b>	<b>Latitude 29<sup>o</sup> N</b>		<b>Longitude 79<sup>o</sup> 30' E</b>			<b>Height above MSL 243.84 m</b>		
40(01-07 Oct)	32.9	23.5	90.9	60.6	7.3	3.4	2.2	6.2
41(08-14 Oct)	33.2	20.5	87.0	50.1	-	3.7	1.9	8.0
42(15-21 Oct)	30.6	20.6	87.6	67.0	420.2	3.5	2.4	5.3
43(22-28 Oct)	29.7	16.6	89.0	44.0	-	3.2	2.6	8.5
44(29-04 Nov)	29.7	14.1	87.6	37.3	-	2.9	1.4	8.3
45(05-11 Nov)	28.1	13.0	90.7	40.7	-	2.6	1.3	7.3
46(12-18 Nov)	27.4	12.3	91.6	38.6	-	2.7	1.1	7.3
47(19-25 Nov)	26.3	11.4	90.4	37.6	-	3.1	2.4	6.7
48(26-02 Dec)	25.2	10.8	92.0	46.1	-	2.1	1.9	5.8
49(03-09 Dec)	25.0	12.1	93.0	49.7	3.0	1.8	2.4	5.2
50(10-16 Dec)	23.4	7.2	89.3	42.4	-	1.6	1.7	7.4
51(17-23 Dec)	19.8	4.3	93.3	45.9	-	1.7	2.5	5.4
52(24-31 Dec)	21.6	8.4	90.1	48.5	2.0	1.9	2.1	5.6
1(01-07 Jan)	20.2	9.1	92.7	55.7	22.2	1.8	2.2	5.0
2(08-14 Jan)	19.6	11.0	94.0	72.6	54.7	2.3	4.6	3.3
3(15-21 Jan)	14.1	8.7	91.4	80.3	2.8	1.1	3.6	0.6
4(22-28 Jan)	17.0	9.3	92.7	71.4	19.2	3.2	5.6	2.1
5(29-04 Feb)	16.0	8.6	91.6	77.1	30.7	1.7	6.1	1.7
6(05-11 Feb)	16.1	7.4	93.9	76.1	17.5	1.5	3.1	3.1
7(12-18 Feb)	22.2	6.7	93.6	47.7	-	2.0	2.4	8.6
8(19-25 Feb)	23.7	9.8	86.3	45.0	-	3.1	6.3	8.0
9(26-04 Mar)	24.7	10.0	92.9	48.0	2.2	2.6	3.1	8.0
10(05-11 Mar)	27.5	11.3	92.3	48.3	-	3.2	3.4	7.0
11(12-18 Mar)	30.7	16.6	90.1	48.6	-	2.9	1.9	7.1
12(19-25 Mar)	33.9	17.1	84.0	40.4	-	3.4	2.4	8.8
13(26-01 Apr)	34.0	15.9	79.7	31.3	-	4.8	4.6	9.0
14(02-08 Apr)	37.0	15.5	76.3	19.3	-	5.9	2.6	9.8
15(09-15 Apr)	37.1	20.9	64.6	30.7	2.6	6.1	5.1	8.3
16(16-22 Apr)	38.2	19.1	63.0	18.9	-	7.1	3.5	9.0

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
<b>SRIGANGANAGAR</b>		<b>Latitude 29<sup>o</sup>66' N</b>			<b>Longitude 75<sup>o</sup>53' E</b>		<b>Height above MSL 175 m</b>	
40(01-07 Oct)	35.1	23.4	80.3	54.7	3.2	6.5	5.4	7.0
41(08-14 Oct)	36.1	19.6	76.6	38.3	-	7.3	6.9	7.7
42(15-21 Oct)	33.4	15.3	78.6	43.0	-	5.7	3.7	6.1
43(22-28 Oct)	29.5	15.2	85.1	52.9	27.6	5.2	9.4	6.0
44(29-04 Nov)	30.4	12.8	84.6	42.9	-	6.8	3.7	7.3
45(05-11 Nov)	30.1	12.7	79.6	37.1	-	5.6	3.1	6.0
46(12-18 Nov)	28.9	12.1	87.3	46.6	-	5.1	3.1	5.8
47(19-25 Nov)	28.1	10.8	90.0	46.3	-	4.1	2.0	5.1
48(26-02 Dec)	25.6	8.6	82.7	48.7	-	2.7	2.7	4.6
49(03-09 Dec)	25.0	7.1	87.3	39.6	-	3.2	2.0	4.4
50(10-16 Dec)	22.3	5.4	88.9	44.6	-	2.3	2.0	4.0
51(17-23 Dec)	21.9	4.7	86.7	45.4	-	1.6	1.6	4.3
52(24-31 Dec)	20.5	6.5	88.8	55.3	-	1.0	1.3	3.0
1(01-07 Jan)	17.8	5.3	91.9	70.9	28.6	0.5	2.6	2.2
2(08-14 Jan)	16.8	5.5	87.0	76.7	12.2	0.5	2.3	2.7
3(15-21 Jan)	14.9	5.4	94.4	81.0	2.1	0.2	1.1	1.1
4(22-28 Jan)	16.7	6.4	91.4	66.6	2.8	1.3	3.1	4.4
5(29-04 Feb)	19.6	4.5	84.9	56.0	0.4	2.1	4.0	6.4
6(05-11 Feb)	18.2	6.0	85.6	57.3	-	2.1	4.3	6.5
7(12-18 Feb)	25.2	7.1	84.7	31.7	-	2.4	2.6	6.8
8(19-25 Feb)	24.1	6.7	79.6	35.0	-	1.8	5.1	6.3
9(26-04 Mar)	24.6	6.1	84.9	37.7	2.3	1.4	5.1	4.8
10(05-11 Mar)	27.8	8.4	73.9	51.6	-	3.0	5.1	7.3
11(12-18 Mar)	32.8	10.5	70.3	49.4	-	3.6	3.1	7.4
12(19-25 Mar)	35.6	11.1	60.0	35.4	-	3.7	4.0	7.4
13(26-01 Apr)	37.0	11.5	63.6	38.1	-	3.9	6.9	7.5
14(02-08 Apr)	39.6	14.8	51.1	28.6	-	5.5	5.4	7.7
15(09-15 Apr)	41.4	18.0	43.4	22.6	-	6.6	6.9	7.6
16(16-22 Apr)	41.0	20.3	41.4	37.9	-	6.1	5.7	6.9
17(23-29 Apr)	42.0	21.3	41.3	36.4	-	6.0	4.9	6.6
18(30-06 May)	42.8	21.1	51.1	32.3	0.4	6.3	4.3	6.4
19(07-13 May)	42.5	23.0	60.4	38.6	-	5.9	6.9	6.4
20(14-20 May)	43.3	23.1	55.4	33.5	-	5.5	5.1	6.4
21(21-27 May)	44.1	23.3	52.3	32.5	-	6.0	5.7	6.9

## NORTH EASTERN PLAINS ZONE

<b>AYODHYA</b>	<b>Latitude 26<sup>o</sup>28' N</b>			<b>Longitude 82<sup>o</sup>7' E</b>		<b>Height above MSL 113 m</b>		
40(01-07 Oct)	32.7	24.5	82.8		18.0	6.2	4.0	8.1
41(08-14 Oct)	34.0	24.0	79.5		-	6.3	1.8	9.0
42(15-21 Oct)	31.8	23.6	81.3		24.0	5.6	5.2	6.9
43(22-28 Oct)	31.1	18.2	68.0		-	4.1	3.2	6.5
44 (29-04 Nov)	29.7	15.0	68.3		-	3.3	1.8	7.5
45 (05-11 Nov)	29.7	13.7	69.4		-	3.2	2.2	6.5
46 (12-18 Nov)	27.7	12.3	77.3		-	3.2	1.5	7.2
47 (19-25 Nov)	27.4	13.5	76.0		-	2.8	1.6	3.6
48 (26-02 Dec)	28.2	13.0	74.9		-	2.6	2.1	5.9
49 (03-09 Dec)	27.5	12.6	74.7		-	3.0	2.5	4.7
50 (10-16 Dec)	22.8	7.9	79.4		-	2.7	3.2	6.2
51 (17-23 Dec)	21.7	5.8	77.3		-	2.0	2.4	5.0
52 (24-31 Dec)	24.6	9.3	78.4		-	2.1	2.0	4.6
1 (01-07 Jan)	19.4	9.3	82.5		14.2	2.2	2.4	2.5
2 (08-14 Jan)	20.2	10.6	87.2		11.6	2.3	2.9	2.1
3 (15-21 Jan)	15.9	5.7	86.6		-	2.3	3.2	1.9
4 (22-28 Jan)	17.3	8.3	87.4		-	2.2	3.2	2.9
5 (29-04 Feb)	19.6	8.8	86.7		-	2.6	3.7	4.9

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
6 (05-11 Feb)	20.8	9.0	84.9		-	2.7	3.3	6.0
7 (12-18 Feb)	24.0	9.9	80.4		-	3.6	3.9	8.3
8 (19-25 Feb)	25.6	13.5	77.7		-	4.9	5.1	8.1
9 (26-04 Mar)	27.1	11.4	79.6		-	5.2	5.5	9.0
10 (05-11 Mar)	29.1	12.5	77.3		-	5.7	3.8	7.8
11 (12-18 Mar)	32.0	16.2	77.1		-	6.4	4.9	8.3
12 (19-25 Mar)	35.3	18.5	72.9		-	6.9	3.9	8.6
13 (26-01 Apr)	36.8	16.7	58.9		-	6.9	4.0	8.3
14 (02-08 Apr)	36.3	17.2	56.9		-	6.3	5.3	9.4
15 (09-15 Apr)	39.2	19.6	54.1		-	4.9	5.2	8.3
16 (16-22 Apr)	40.7	22.4	53.1		-	5.9	4.0	9.4
<b>BURDWAN</b>	<b>Latitude 23<sup>o</sup>15' N</b>		<b>Longitude 87<sup>o</sup>52'E</b>		<b>Height above MSL 32 m</b>			
45 (05-11 Nov)	29.14	16.9			-			
46 (12-18 Nov)	26.14	19.25			33.4			
47 (19-25 Nov)	29.82	17.32			-			
48 (26-02 Dec)	27.6	15.64			-			
49 (03-09 Dec)	25.6	18.35			124.8			
50 (10-16 Dec)	25.42	14.51			1.8			
51 (17-23 Dec)	23.58	11.31			-			
52 (24-31 Dec)	25.02	14.15			0.4			
1 (01-07 Jan)	23.41	11.45			-			
2 (08-14 Jan)	25	14.94			9.8			
3 (15-21 Jan)	22.25	11.8			-			
4 (22-28 Jan)	22.9	14.07			6.4			
5 (29-04 Feb)	24.72	11.94			4.4			
6 (05-11 Feb)	23.1	13.78			30			
7 (12-18 Feb)	24.81	12.05			-			
8 (19-25 Feb)	28.24	15.47			7.4			
9 (26-04 Mar)	29.22	17.71			10.6			
10 (05-11 Mar)	31.38	17.7			-			
11 (12-18 Mar)	33.88	19.37			-			
12 (19-25 Mar)	35.72	23.94			-			
13 (26-01 Apr)	36.08	24.9			-			
14 (02-08 Apr)	34.87	25.94			-			
15 (09-15 Apr)	36.74	25.7			-			
16 (16-22 Apr)	37.41	26.08			-			
17 (23-29 Apr)	39.9	26.95			-			
<b>COOCHBEHAR</b>	<b>Latitude 26<sup>o</sup>19'86" N</b>		<b>Longitude 89<sup>o</sup>23'53" E</b>		<b>Height above MSL 43 m</b>			
45(05-11 Nov)	30.77	13.48	72.70	46.90	-			7.12
46(12-18 Nov)	30.20	12.20	75.17	46.89	-			7.09
47(19-25 Nov)	28.88	12.52	77.72	55.49	-			5.87
48(26-02 Dec)	27.72	11.17	74.17	54.55	-			5.46
49(03-09 Dec)	28.83	13.17	75.62	51.75	-			6.75
50(10-16 Dec)	27.73	13.88	80.16	54.58	-			6.02
51(17-23 Dec)	27.20	11.64	80.92	48.06	-			6.41
52(24-31 Dec)	25.54	10.49	75.09	48.91	-			5.77
1(01-07 Jan)	24.30	11.32	89.11	56.09	0.12			4.64
2(08-14 Jan)	25.36	11.93	87.71	53.71	0.07			5.04
3(15-21 Jan)	24.55	11.90	91.47	56.37	0.09			4.31
4(22-28 Jan)	23.61	11.51	86.35	58.94	0.31			3.99
5(29-04 Feb)	22.52	9.20	90.03	49.49	0.07			3.59
6(05-11 Feb)	21.49	10.16	91.50	58.75	3.29			2.62
7(12-18 Feb)	24.57	10.82	84.75	48.77	0.33			5.24
8(19-25 Feb)	25.70	10.72	75.18	44.88	0.69			6.26
9(26-04 Mar)	27.10	13.07	71.92	48.19	1.45			6.62
10(05-11 Mar)	30.40	14.78	67.69	41.42	0.14			7.45
11(12-18 Mar)	33.28	15.50	63.27	35.04	0.01			7.62

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
12(19-25 Mar)	34.30	19.20	69.53	40.10	0.37			6.70
13(26-01 Apr)	31.43	20.51	81.65	56.21	1.25			3.86
14(02-08 Apr)	26.70	20.96	94.87	81.52	35.86			0.39
15(09-15 Apr)	27.82	20.85	91.89	75.75	29.16			0.67
<b>IARI PUSA BIHAR</b>	<b>Latitude 25<sup>o</sup>98' N</b>			<b>Longitude 85<sup>o</sup>67' E</b>		<b>Height above MSL 52.1 m</b>		
40(01-07 Oct)	26.9	24.4	95	83	225.9	1.6		0
41(08-14 Oct)	33.7	24.9	95	69	39.8	2.9		5.8
42(15-21 Oct)	31	24.3	91	78	93.4	2.1		3.4
43(22-28 Oct)	30.5	20.6	95	65	-	2.3		5.7
44 (29-04 Nov)	29.9	16.5	95	51	-	2.5		7.9
45 (05-11 Nov)	29.5	15.5	97	51	-	2.4		7.1
46 (12-18 Nov)	28.9	13.8	92	55	-	2.4		8.3
47 (19-25 Nov)	27.6	13.9	97	60	-	1.8		5.3
48 (26-02 Dec)	26.9	12.4	98	60	-	1.7		4.8
49 (03-09 Dec)	27.8	13.9	97	59	-	1.6		7
50 (10-16 Dec)	24.3	9.1	97	56	-	1.6		6.5
51 (17-23 Dec)	22.5	7.6	96	56	-	1.6		5.5
52 (24-31 Dec)	22.4	11	94	66	7.7	1		3.2
1 (01-07 Jan)	18.5	10.5	94.1	79.9	-	0.9		0.9
2 (08-14 Jan)	22.9	12.9	97.0	69.3	0.7	1.1		3.5
3 (15-21 Jan)	17.4	8.5	96.1	70.1	-	1.3		3.0
4 (22-28 Jan)	20.0	11.1	94.9	66.1	-	1.3		1.5
5 (29-04 Feb)	18.8	9.1	96.1	74.4	4.2	4.5		1.3
6 (05-11 Feb)	20.9	10.4	96.7	65.7	-	1.6		5.6
7 (12-18 Feb)	24.1	9.7	95.9	53.9	-	2.5		8.5
8 (19-25 Feb)	25.0	12.3	91.0	56.3	-	3.3		7.4
9 (26-04 Mar)	27.5	12.9	93.7	54.6	-	3.4		8.1
10 (05-11 Mar)	29.7	14.3	90.7	48.6	-	4.2		8.6
11 (12-18 Mar)	32.1	16.9	91.1	54.9	-	4.2		8.1
12 (19-25 Mar)	35.0	20.4	89.4	51.4	-	4.4		7.0
13 (26-01 Apr)	33.6	20.2	90.1	55.4	-	4.9		5.8
14 (02-08 Apr)	35.2	22.7	93.4	55.0	-	4.5		5.4
15 (09-15 Apr)	35.2	22.2	87.4	57.3	-	5.0		6.1
16 (16-22 Apr)	35.6	21.7	80.0	52.3	-	5.2		4.9
17 (23-29 Apr)	37.9	21.3	85.9	38.9	-	6.1		8.3
<b>KALYANI</b>	<b>Latitude 22<sup>o</sup>57'N</b>			<b>Longitude 88<sup>o</sup>20'E</b>		<b>Height above MSL 9.75 m</b>		
40 (01-07 Oct)	33.1	26.11	90.11	79.21	-	3.11	1.43	6.3
41 (08-14 Oct)	32.01	24.52	91.42	68.24	-	2.66	0.8	7.24
42 (15-21 Oct)	31.6	24	92.6	73.65	3.6	2.11	0.81	7.36
43 (22-28 Oct)	29.7	22.11	94.71	72.56	-	1.84	1.3	6.94
44 (29-04 Nov)	30.5	23.9	89.22	68.74	-	2.33	0.89	7.84
45 (05-11 Nov)	31	19.51	90.16	60.11	-	2.65	0.33	7.96
46 (12-18 Nov)	30.6	16.34	86.33	54.22	-	2.22	0.43	8.37
47 (19-25 Nov)	28.9	18.77	87.44	41.25	-	1.74	0.54	6.74
48 (26-02 Dec)	27.5	17.5	92.1	71.98	15.6	1.65	1.63	5.32
49 (03-09 Dec)	26.5	12.9	96.16	81.2	96.22	1.01	0.22	5.04
50 (10-16 Dec)	25.4	11.5	94.5	75.2	-	1.21	0.27	6.44
51 (17-23 Dec)	22.31	10.73	92.31	65.34	-	1.8	0.32	5.17
52 (24-31 Dec)	23.8	9.88	85.55	63.54	-	1.52	0.11	6.96
1 (01-07 Jan)	24	9.04	90.41	73.54	3.4	1.65	1.01	4.98
2 (08-14 Jan)	21.3	12.53	89.3	62.28	-	1.63	0.67	7.21
3 (15-21 Jan)	22.5	11.88	89.4	56.74	-	1.31	0.37	5.32
4 (22-28 Jan)	20.11	11.3	85.43	41.36	-	1.24	1.24	4.57
5 (29-04 Feb)	21.4	10.44	88.4	55.24	-	1.7	1.36	6.26
6 (05-11 Feb)	23.06	13.4	86.43	47.23	-	2.17	1.22	7.16
7 (12-18 Feb)	25.6	13.1	87.6	62.35	2.22	1.3	0.87	6.74
8 (19-25 Feb)	26.83	15.2	88.32	60.26	1.51	0.84	0.74	4.38

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
9 (26-04 Mar)	33.5	18.54	89.11	58.17	-	1.36	1.33	7.34
10 (05-11 Mar)	34.56	20.66	91.73	64.36	0.66	3.33	1.11	6.04
11 (12-18 Mar)	32.55	20.6	88.14	48.5	-	3.43	1.63	4.55
12 (19-25 Mar)	35.41	21.83	85.41	47.86	-	3.77	1.27	7.33
13 (26-01 Apr)	37.48	23.96	83.6	30.46	-	4.22	0.98	6.55
14 (02-08 Apr)	38.14	22.7	82.7	31.18	-	3.77	1.04	7.17
15 (09-15 Apr)	37.22	25.52	84.31	41.77	-	4.84	1.12	7.34
16 (16-22 Apr)	36	27.36	81.36	38.98	-	4.11	2.01	7.55
17 (23-29 Apr)	35.9	26.8	84.36	42.32	0.03	4.63	1.31	7.63
18 (30-06 May)	38.54	24.3	83.25	48.11	1.2	4.78	3.62	5.75
19 (7-13 May)	39.11	25.36	82.36	49.36	3.6	4.65	3.36	5.32
<b>KANPUR</b>	<b>Latitude 26<sup>o</sup>29'N</b>		<b>Longitude 80<sup>o</sup>18'E</b>			<b>Height above MSL 125.9 m</b>		
40 (01-07 Oct)	34.4	25.1	86	61	8.2	21.4	4.1	7
41 (08-14 Oct)	34.4	22.7	82	45	-	23.8	3.4	7.7
42 (15-21 Oct)	32.4	22.5	87	56	136.6	22.4	5.3	4.6
43 (22-28 Oct)	30.6	18	87	48	-	22.4	3.3	6.4
44 (29-04 Nov)	29.7	14.2	93	43	-	21.6	1.7	7.2
45 (05-11 Nov)	28.8	12.8	95	42	-	20.4	1.8	4.4
46 (12-18 Nov)	27.5	11.9	95	44	-	19.6	1.1	5.4
47 (19-25 Nov)	26.9	13.3	83	42	1.2	19.6	2.5	4.6
48 (26-02 Dec)	26.3	11.9	95	47	-	18.8	1.2	2.5
49 (03-09 Dec)	26	13.5	92	47	-	16.8	2.4	4.8
50 (10-16 Dec)	23.7	8.6	95	44	-	16.2	1.7	4.3
51 (17-23 Dec)	22.1	7.1	85	43	-	15.4	4.1	4.4
52 (24-31 Dec)	20	9	97	75	8.6	16.4	1.7	1.2
1 (01-07 Jan)	20.4	8.5	96	70	23.5	11.2	3	2.6
2 (08-14 Jan)	19.6	10.3	94	74	14.6	10	4.1	2.3
3 (15-21 Jan)	15.7	4.9	93	72	-	9.8	3.5	2.1
4 (22-28 Jan)	17.9	7.7	95	66	3	8.6	4.8	2.3
5 (29-04 Feb)	21.2	7.5	91	58	13	8.4	5.9	6.3
6 (05-11 Feb)	22.7	8.1	93	52	-	9.4	4.3	6.1
7 (12-18 Feb)	25	8.1	93	50	-	11	3.9	8.4
8 (19-25 Feb)	27.4	12.3	87	42	-	13.4	6.2	8.3
9 (26-04 Mar)	27.8	11.7	90	46	-	14.6	3.5	8
10 (05-11 Mar)	29.2	13.9	87	44	-	15.4	4.8	6.6
11 (12-18 Mar)	33.4	17.4	83	44	-	38.4	4.4	7
12 (19-25 Mar)	36.4	18.6	79	30	-	18.2	3.7	6
13 (26-01 Apr)	38.2	18.4	72	28	-	19	5	7.2
14 (02-08 Apr)	40	17.6	68	22	-	23.8	3.5	7.2
15 (09-15 Apr)	40.8	21.1	64	25	-	26	4.2	6
16 (16-22 Apr)	41.1	22	55	26	-	3.8	4.4	6.3
17 (23-29 Apr)	42.2	22.2	46	19	-	3.8	4.7	6.2
18 (30-06 May)	39.8	25	65	29	-	3.8	7.3	4.3
<b>RANCHI</b>	<b>Latitude 23<sup>o</sup>21'N</b>		<b>Longitude 85<sup>o</sup>20'E</b>			<b>Height above MSL 629 m</b>		
40 (01-07 Oct)	31.9	23.8	86	69	49.6	19.8	2.5	55.9
41 (08-14 Oct)	32.0	22.5	85	69	-	25.1	2.0	61.8
42 (15-21 Oct)	31.7	22.1	87	69	36.2	16.6	2.1	35
43 (22-28 Oct)	29.8	19.0	86	69	-	19	1.9	55.9
44 (29-04 Nov)	29.8	19.6	85	70	-	19.6	2.1	53
45 (05-11 Nov)	28.8	17.4	84	68	-	16.2	2.1	55.7
46 (12-18 Nov)	28.7	17.7	86	70	24.2	16.9	2.0	25.8
47 (19-25 Nov)	29.0	19.2	86	68	-	23	2.2	54.9
48 (26-02 Dec)	26.0	9.3	85	70	-	24	2.5	54.8
49 (03-09 Dec)	26.8	9.9	85	69	8.4	20.6	2.2	54.2
50 (10-16 Dec)	25.7	7.5	85	69	-	20	2.4	61.6
51 (17-23 Dec)	22.0	3.6	86	69	-	17.6	3.4	60.1
52 (24-31 Dec)	23.3	8.0	87	69	14.2	18.7	2.7	34

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
1 (01-07 Jan)	21.0	5.6	87	69	4	11.5	39.4	11.5
2 (08-14 Jan)	25.9	13.2	86	69	10.2	0	11.8	0
3 (15-21 Jan)	23.4	7.4	86	68	10.4	16.6	61.6	16.6
4 (22-28 Jan)	24.5	10.9	86	70	14.2	20.7	54.9	20.7
5 (29-04 Feb)	23.3	7.1	85	70	0	19.9	62.9	19.9
6 (05-11 Feb)	23.8	9.6	85	69	12.4	21.4	60.6	21.4
7 (12-18 Feb)	25.2	8.8	85	70	-	23.2	47.3	23.2
8 (19-25 Feb)	26.0	11.6	86	69	-	25.6	65.2	25.6
9 (26-04 Mar)	26.7	13.8	85	68	-	23.7	66.3	23.7
10 (05-11 Mar)	29.7	13.5	85	69	-	24.7	65.2	24.7
11 (12-18 Mar)	32.3	15.0	87	70	-	23.7	60.5	23.7
12 (19-25 Mar)	34.9	15.4	85	70	-	25.6	66.4	25.6
13 (26-01 Apr)	34.4	15.2	85	70	-	26.6	67	26.6
14 (02-08 Apr)	36.1	16.3	87	70	-	29.7	66.1	29.7
15 (09-15 Apr)	38.1	20.4	85	69	-	28.2	66.9	28.2
16 (16-22 Apr)	38.9	23.8	86	69	6	25.4	66.8	25.4
17 (23-29 Apr)	39.2	26.4	88	70	-	24.4	65.8	24.8
18 (30-06 May)	37.3	24.8	87	69	-	28.6	67.8	22.6
<b>RAU PUSA BIHAR</b>	<b>Latitude 28.98<sup>o</sup> N</b>				<b>Longitude 85.67<sup>o</sup> E</b>		<b>Height above MSL 52.0 m</b>	
40 (01-07 Oct)								
41 (08-14 Oct)								
42 (15-21 Oct)								
43 (22-28 Oct)								
44 (29-04 Nov)								
45 (05-11 Nov)								
46 (12-18 Nov)								
47 (19-25 Nov)								
48 (26-02 Dec)								
49 (03-09 Dec)								
50 (10-16 Dec)								
51 (17-23 Dec)								
52 (24-31 Dec)								
1 (01-07 Jan)								
2 (08-14 Jan)								
3 (15-21 Jan)								
4 (22-28 Jan)								
5 (29-04 Feb)								
6 (05-11 Feb)								
7 (12-18 Feb)								
8 (19-25 Feb)								
9 (26-04 Mar)								
10 (05-11 Mar)								
11 (12-18 Mar)								
12 (19-25 Mar)								
13 (26-01 Apr)								
14 (02-08 Apr)								
15 (09-15 Apr)								
16 (16-22 Apr)								
17 (23-29 Apr)								
18 (30-06 May)								
19 (7-13 May)								
20 (14-20 May)								
21 (21-27 May)								
<b>SABOUR</b>	<b>Latitude 25<sup>o</sup> 23' N</b>		<b>Longitude 87<sup>o</sup> 07' E</b>		<b>Height above MSL 37.1m</b>			
40 (01-07 Oct)	31.2	25.8	93.7	75.1	44.2	14.0	6.4	6.1
41 (08-14 Oct)	33.0	25.9	93.7	71.0	6.8	22.7	3.9	6.5



Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
42 (15-21 Oct)	31.5	25.4	94.6	76.1	159.0	11.7	5.8	3.3
43 (22-28 Oct)	32.2	22.6	94.6	72.6	0.0	14.7	1.0	5.7
44 (29-04 Nov)	30.2	18.6	94.3	70.4	0.0	16.6	4.2	7.5
45 (05-11 Nov)	28.7	16.8	93.1	69.1	0.0	16.8	1.9	7.7
46 (12-18 Nov)	29.0	17.3	94.3	71.4	0.0	16.0	2.3	4.9
47 (19-25 Nov)	27.3	15.3	94.9	76.7	0.0	11.9	2.9	3.4
48 (26-02 Dec)	25.6	14.8	92.3	77.1	0.0	8.4	2.3	4.1
49 (03-09 Dec)	27.5	16.3	92.0	73.4	0.0	12.1	3.1	4.6
50 (10-16 Dec)	25.5	10.8	95.3	69.7	0.0	11.1	4.4	5.4
51 (17-23 Dec)	23.6	8.7	95.9	66.9	0.0	9.4	7.1	5.1
52 (24-31 Dec)	23.2	12.2	95.3	63.4	15.6	10.1	7.0	2.2
1 (01-07 Jan)	19.5	10.5	96.0	67.4	0.0	0.6	7.6	2.5
2 (08-14 Jan)	22.6	13.0	93.0	63.1	1.8	1.0	3.3	2.4
3 (15-21 Jan)	19.3	9.0	98.0	65.9	0.0	1.0	10.3	3.6
4 (22-28 Jan)	20.0	12.3	93.7	64.6	5.9	0.9	6.8	1.1
5 (29-04 Feb)	20.7	8.8	96.0	67.1	22.0	1.1	8.1	1.8
6 (05-11 Feb)	21.8	10.3	96.7	59.9	10.4	1.4	6.5	6.3
7 (12-18 Feb)	24.5	9.3	94.3	55.9	0.0	2.0	5.5	8.5
8 (19-25 Feb)	26.0	12.5	90.5	61.8	0.0	2.4	9.8	7.2
9 (26-04 Mar)	27.8	14.7	90.6	47.6	0.0	2.0	5.9	6.7
10 (05-11 Mar)	30.3	15.0	91.4	49.6	0.0	3.1	6.0	7.2
11 (12-18 Mar)	32.6	18.9	82.4	44.1	0.0	4.5	7.1	7.5
12 (19-25 Mar)	35.4	22.5	88.0	42.4	0.0	5.2	6.7	5.1
13 (26-01 Apr)	34.4	22.3	83.3	51.3	0.0	4.1	14.7	4.7
14 (02-08 Apr)	35.3	23.4	89.6	52.0	0.0	-	-	-
15 (09-15 Apr)	40.0	21.0	83.0	39.0	0.0	-	-	-
16 (16-22 Apr)	36.6	21.7	79.7	60.9	0.4	-	-	-
<b>SHILLONGANI</b>	<b>Latitude 26° 21' N</b>		<b>Longitude 90° 45' E</b>			<b>Height above MSL 50.2 m</b>		
40 (01-07 Oct)	32.6	20.6	92	71	47.4			
41 (08-14 Oct)	33.9	20.9	92	71	0.0			
42 (15-21 Oct)	32.4	19.6	94	72	95.2			
43 (22-28 Oct)	31.4	17.4	90	62	0.0			
44 (29-04 Nov)	30.4	16.5	93	57	1.0			
45 (05-11 Nov)	30.1	14.0	91	58	0.0			
46 (12-18 Nov)	29.1	12.1	90	56	0.0			
47 (19-25 Nov)	27.1	12.0	91	64	0.0			
48 (26-02 Dec)	28.0	9.4	91	62	0.0			
49 (03-09 Dec)	27.6	10.7	91	61	0.0			
50 (10-16 Dec)	25.6	8.7	92	63	0.0			
51 (17-23 Dec)	25.4	7.6	89	58	0.0			
52 (24-31 Dec)	24.1	9.9	91	61	0.0			
1 (01-07 Jan)	24.7	10.4	89	58	0.0			
2 (08-14 Jan)	24.6	12.4	90	59	22.2			
3 (15-21 Jan)	23.9	10.9	90	56	7.4			
4 (22-28 Jan)	22.5	11.4	91	64	0.0			
5 (29-04 Feb)	21.4	9.1	90	60	2.8			
6 (05-11 Feb)	21.7	8.9	92	63	22.8			
7 (12-18 Feb)	24.4	11.2	91	61	3.0			
8 (19-25 Feb)	24.3	11.3	88	60	1.4			
9 (26-04 Mar)	27.6	14.5	87	56	4.6			
10 (05-11 Mar)	31.7	16.1	84	49	0.0			
11 (12-18 Mar)	33.4	18.4	76	53	0.0			
12 (19-25 Mar)	34.2	19.9	63	52	0.0			
13 (26-01 Apr)	28.9	17.9	84	66	17.6			
14 (02-08 Apr)	26.2	19.4	91	80	22.8			
15 (09-15 Apr)	26.6	20.0	95	71	57.8			
16 (16-22 Apr)	31.1	20.6	91	68	15.0			

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
17 (23-29 Apr)	31.1	20.2	92	61	49.4			
<b>VARANASI</b>	<b>Latitude 25<sup>o</sup> 20' N</b>		<b>Longitude 83<sup>o</sup> 03' E</b>			<b>Height above MSL 128.93 m</b>		
45 (05-11 Nov)	29.7	14	95	54	-	1.8	0.6	6.7
46 (12-18 Nov)	28.5	13.5	96	48	-	1.9	0.4	6.5
47 (19-25 Nov)	28.7	12.2	90	40	-	1.8	1	7.2
48 (26-02 Dec)	26.7	10.6	97	51	-	1.2	0.4	5.4
49 (03-09 Dec)	26.8	12.8	97	54	-	1.2	0.6	4.2
50 (10-16 Dec)	24.6	8.6	94	44	-	1.2	0.5	5.4
51 (17-23 Dec)	22.3	7.2	91	53	-	1.3	1.1	6
52 (24-31 Dec)	21.9	10	97	72	-	0.8	1	3.1
1 (01-07 Jan)	19.2	8.8	98	75	1.2	0.6	0.9	3.3
2 (08-14 Jan)	22.1	11.8	96	74	5.4	0.9	1.4	1.6
3 (15-21 Jan)	18.5	6.7	93	70	-	1.2	1.6	2.2
4 (22-28 Jan)	20	9.8	94	68	49	1.7	3.1	3.4
5 (29-04 Feb)	22.7	8.6	94	61	-	1.9	3.7	7.2
6 (05-11 Feb)	22.6	9.6	94	57	-	2	2.9	5.7
7 (12-18 Feb)	25	7.9	92	47	-	2.7	2.6	9.6
8 (19-25 Feb)	26.7	12.3	90	59	0.3	3.2	3.7	8.7
9 (26-04 Mar)	28.6	12.5	95	53	0.4	2.9	1.9	8.4
10 (05-11 Mar)	29.7	13.5	89	54	-	3.5	2.4	9.4
11 (12-18 Mar)	32.9	16.6	89	53	-	4.1	2.4	8.9
12 (19-25 Mar)	36.5	19.3	85	49	-	4.6	2.3	8.7
13 (26-01 Apr)	38	18.6	79	39	-	5.9	3.1	9.4
14 (02-08 Apr)	40.2	18.1	76	31	-	6.5	2.6	9.7
15 (09-15 Apr)	40.5	21.6	78	33	-	6.2	3.1	9.4
16 (16-22 Apr)	40.9	21.9	73	32	-	7.5	3.4	9.8

## CENTRAL ZONE

<b>BILASPUR</b>	<b>Latitude 22<sup>o</sup>9' N</b>		<b>Longitude 82<sup>o</sup>12' E</b>			<b>Height above MSL 292.3 m</b>		
44 (29-04 Nov)	30.2	16.0	90.3	63.3	-	2.6	85.0	5.6
45 (05-11 Nov)	29.6	12.7	84.9	52.0	-	2.6	0.5	7.0
46 (12-18 Nov)	29.2	17.5	93.0	69.1	14.8	2.1	0.7	5.1
47 (19-25 Nov)	30.5	17.3	89.1	67.0	0.4	2.1	0.5	5.7
48 (26-02 Dec)	28.9	10.7	88.1	48.9	-	2.4	0.3	8.4
49 (03-09 Dec)	28.7	14.1	93.0	63.9	-	2.5	0.8	6.8
50 (10-16 Dec)	27.8	11.4	94.7	54.0	-	2.3	0.5	6.8
51 (17-23 Dec)	25.3	6.8	88.9	45.9	-	2.2	1.0	8.0
52 (24-31 Dec)	27.5	25.1	95.1	68.5	29.0	2.0	0.5	2.5
1 (01-07 Jan)	26.1	9.8	92.9	58.0	-	1.9	0.2	7.9
2 (08-14 Jan)	24.5	13.1	95.0	76.4	10.8	1.2	0.9	1.8
3 (15-21 Jan)	23.8	9.2	95.0	62.0	8.2	1.7	0.4	7.6
4 (22-28 Jan)	25.0	9.4	94.3	55.7	3.6	1.9	0.9	7.6
5 (29-04 Feb)	27.0	8.0	96.0	45.4	0.6	2.3	0.5	9.4
6 (05-11 Feb)	33.0	13.9	77.7	38.7	-	4.4	1.5	9.6
7 (12-18 Feb)	26.8	10.1	89.0	44.1	-	2.8	0.7	8.7
8 (19-25 Feb)	30.7	11.9	89.4	47.0	-	3.0	0.9	8.5
9 (26-04 Mar)	31.9	15.3	83.9	52.3	-	3.7	0.9	8.1
10 (05-11 Mar)	33.0	13.9	77.7	38.7	-	4.4	1.5	9.6
11 (12-18 Mar)	36.1	16.1	72.1	40.4	-	4.6	1.3	9.7
12 (19-25 Mar)	37.5	19.4	76.9	46.3	-	4.2	1.1	6.8
13 (26-01 Apr)	38.8	17.6	74.8	35.3	1.6	5.7	0.5	8.5
<b>Dhanduka</b>	<b>Latitude 22<sup>o</sup>30' N</b>		<b>Longitude 72<sup>o</sup>30' E</b>			<b>Height above MSL 39.78 m</b>		
40 (01-07 Oct)	33.0	19.4	74.4	62.2	20.5		2.1	5.8
41 (08-14 Oct)	33.5	19.9	62.4	41.2	-		2.3	5.6
42 (15-21 Oct)	32.8	19.8	63.2	36.5	-		1.8	6.5

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
43 (22-28 Oct)	32.3	18.6	60.2	34.0	-		1.9	6.6
44 (29-04 Nov)	31.3	16.8	59.0	29.5	-		2.3	6.8
45 (05-11 Nov)	32.0	16.5	56.4	28.5	-		2.5	7.4
46 (12-18 Nov)	31.6	17.0	46.1	29.4	-		3.4	7.9
47 (19-25 Nov)	31.7	20.4	53.1	30.4	-		3.5	6.3
48 (26-02 Dec)	30.5	16.0	57.8	43.5	4.4		0.6	6.4
49 (03-09 Dec)	27.7	18.1	64.8	43.1	-		3.3	4.8
50 (10-16 Dec)	29.4	17.2	53.5	30.7	-		1.7	5.8
51 (17-23 Dec)	26.7	12.1	46.5	32.1	-		1.5	7.2
52 (24-31 Dec)	27.2	14.5	62.5	48.7	-		2.2	7.0
1 (01-07 Jan)	27.2	16.9	73.2	46.8	-		1.4	6.1
2 (08-14 Jan)	24.2	10.8	62.8	39.4	-		2.6	4.9
3 (15-21 Jan)	27.0	13.2	16.5	34.7	-		2.1	6.6
4 (22-28 Jan)	24.7	10.1	53.1	30.0	-		2.3	8.1
5 (29-04 Feb)	29.2	11.1	53.0	29.8	-		3.5	9.2
6 (05-11 Feb)	29.6	12.5	44.1	29.8	-		1.6	9.4
7 (12-18 Feb)	30.7	13.7	45.7	23.7	-		2.1	8.8
8 (19-25 Feb)	32.6	14.6	45.8	21.2	-		1.7	9.2
9 (26-04 Mar)	34.6	17.1	37.4	17.7	-		1.6	9.1
10 (05-11 Mar)	35.2	18.4	43.4	21.1	-		2.1	9.2
11 (12-18 Mar)	38.6	19.4	42.8	21.8	-		2.4	8.5
12 (19-25 Mar)	38.9	21.7	41.1	22.7	-		5.2	9.4
13 (26-01 Apr)	40.1	20.4	41.1	20.7	-		3.2	8.0
14 (02-08 Apr)	41.7	22.0	41.4	21.0	-		2.2	9.2
15 (09-15 Apr)	41.0	22.4	22.2	20.2	-		3.4	9.3
16 (16-22 Apr)	41.5	22.8	45.4	20.7	-		4.1	9.5
<b>Durgapura</b>	<b>Latitude 26°51' N</b>		<b>Longitude 75°47' E</b>		<b>Height above MSL 390 M</b>			
40 (01-07 Oct)	32.0	24.2	85.0	61.0	15.1		6.2	
41 (08-14 Oct)	33.3	23.5	83.0	53.0	24.6		4.1	
42 (15-21 Oct)	35.6	21.0	66.0	32.0	-		3.6	
43 (22-28 Oct)	32.1	19.0	67.0	41.0	5.0		4.6	
44 (29-04 Nov)	30.8	17.5	60.0	30.0	-		5.0	
45 (05-11 Nov)	30.6	13.8	55.0	19.0	-		3.3	
46 (12-18 Nov)	30.4	13.0	68.0	19.0	-		2.7	
47 (19-25 Nov)	27.6	11.1	72.0	21.0	-		2.2	
48 (26-02 Dec)	26.9	12.2	67.0	30.0	0.8		2.9	
49 (03-09 Dec)	27.9	12.6	72.0	33.0	-		3.1	
50 (10-16 Dec)	24.5	9.9	80.0	36.0	0.4		2.8	
51 (17-23 Dec)	23.1	9.7	68.0	39.0	-		4.1	
52 (24-31 Dec)	22.4	6.0	65.0	17.0	-		3.6	
1 (01-07 Jan)	22.1	10.7	73.3	38.0	3.2		4.6	
2 (08-14 Jan)	20.6	9.0	87.0	83.0	8.2		3.5	
3 (15-21 Jan)	17.9	7.6	92.0	54.0	16.6		5.2	
4 (22-28 Jan)	19.2	6.8	92.0	50.0	-		3.5	
5 (29-04 Feb)	18.4	6.8	88.0	41.0	9.2		5.3	
6 (05-11 Feb)	23.7	8.6	82.0	34.0	-		4.3	
7 (12-18 Feb)	23.7	10.0	78.0	32.0	-		4.4	
8 (19-25 Feb)	25.9	11.0	61.0	24.0	-		3.6	
9 (26-04 Mar)	28.4	13.7	48.0	23.0	-		5.3	
10 (05-11 Mar)	27.6	13.1	70.0	26.0	-		7.2	
11 (12-18 Mar)	29.4	13.9	60.0	23.0	-		5.4	
12 (19-25 Mar)	35.2	17.2	55.0	17.0	-		4.5	
13 (26-01 Apr)	37.1	22.1	47.0	16.0	-		5.3	
14 (02-08 Apr)	37.0	19.4	35.0	9.0	-		4.9	
15 (09-15 Apr)	37.7	19.3	40.0	9.0	-		4.2	
16 (16-22 Apr)	40.5	23.1	28.0	9.0	-		5.1	

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
<b>INDORE</b>	Latitude 22 <sup>o</sup> 37' N		Longitude 75 <sup>o</sup> 50' N		Height above MSL 557 m			
40 (01-07 Oct)	32.0	22.9	88.6	86.4	17.1		0.01	
41 (08-14 Oct)	32.7	22.0	86.8	74.8	-		0.01	
42 (15-21 Oct)	30.4	17.7	87.8	78.4	49.7		0.05	
43 (22-28 Oct)	29.4	15.7	81.1	84.5	0		0.01	
44 (29-04 Nov)	28.2	11.7	82.4	85.4	-		0.01	
45 (05-11 Nov)	28.5	10.6	78.1	80.5	-		0.01	
46 (12-18 Nov)	28.0	12.0	74.4	83.4	-		0.07	
47 (19-25 Nov)	29.0	17.4	85.9	85.6	-		0.05	
48 (26-02 Dec)	26.9	11.7	76.2	80.5	13.1		0.04	
49 (03-09 Dec)	22.9	12.6	86.3	86.9	4.2		0.02	
50 (10-16 Dec)	25.6	13.6	84.3	85.3	-		0.01	
51 (17-23 Dec)	22.8	7.0	86.0	85.7	-		0.04	
52 (24-31 Dec)	22.5	9.3	81.8	88.5	-		0.05	
1 (01-07 Jan)	23.4	13.4	80.2	80.0	4.3		0.80	
2 (08-14 Jan)	26.1	13.7	87.4	85.3	27.4		0.34	
3 (15-21 Jan)	27.7	12.0	88.1	84.2	-		0.31	
4 (22-28 Jan)	24.6	7.4	83.1	82.7	-		0.25	
5 (29-04 Feb)	26.3	7.4	82.5	78.5	-		0.12	
6 (05-11 Feb)	24.6	7.9	86.5	74.2	-		0.26	
7 (12-18 Feb)	29.0	11.9	80.0	79.2	-		0.16	
8 (19-25 Feb)	29.3	11.6	75.2	79.2	-		0.21	
9 (26-04 Mar)	31.6	13.7	77.5	77.0	-		0.52	
10 (05-11 Mar)	30.9	15.0	81.0	78.9	-		0.45	
11 (12-18 Mar)	36.4	16.6	71.5	68.1	-		0.28	
12 (19-25 Mar)	37.3	19.6	84.2	69.9	-		0.24	
13 (26-01 Apr)	38.8	17.7	75.0	71.0	-		0.19	
14 (02-08 Apr)	40.0	19.6	80.3	64.0	-		0.26	
15 (09-15 Apr)	40.5	22.3	75.6	73.9	-		0.22	
16 (16-22 Apr)	40.6	25.1	78.9	71.4	-		0.45	
<b>JABALPUR</b>	Latitude 23 <sup>o</sup> 09' N		Longitude 79 <sup>o</sup> 58' E		Height above MSL 411 m			
40 (01-07 Oct)	32.9	23.7	84	58	-	3.7	2.3	8.2
41 (08-14 Oct)	33.3	20.0	84	48	-	3.8	1.5	8.6
42 (15-21 Oct)	31.9	19.9	88	48	67.0	3.8	2.8	8.1
43 (22-28 Oct)	30.7	16.0	87	41	-	2.7	1.4	8.3
44 (29-04 Nov)	28.7	11.0	84	33	-	2.6	1.4	9.0
45 (05-11 Nov)	28.7	10.5	84	34	-	2.2	1.2	7.8
46 (12-18 Nov)	27.6	12.8	85	45	-	1.8	2.4	4.9
47 (19-25 Nov)	29.1	15.0	87	46	1.8	1.8	1.6	4.3
48 (26-02 Dec)	27.1	8.9	86	33	-	1.9	1.7	7.7
49 (03-09 Dec)	26.0	12.3	89	53	-	1.6	2.3	3.7
50 (10-16 Dec)	25.4	8.9	86	41	-	1.9	1.8	5.4
51 (17-23 Dec)	23.8	4.8	76	31	-	2.0	2.2	7.8
52 (24-31 Dec)	23.4	8.9	88	58	23.8	1.7	1.9	5.6
1 (01-07 Jan)	23.2	8.6	85	50	-	1.6	2.4	7.0
2 (08-14 Jan)	21.9	12.9	93	69	10.4	1.6	3.8	2.6
3 (15-21 Jan)	20.8	7.0	91	57	-	1.4	2.5	5.2
4 (22-28 Jan)	21.6	7.1	88	52	5.7	1.7	2.5	7.0
5 (29-04 Feb)	23.0	3.9	75	33	-	1.4	1.8	10.0
6 (05-11 Feb)	24.4	7.4	81	39	4.4	2.5	2.6	7.5
7 (12-18 Feb)	24.7	8.0	82	31	-	2.8	2.8	9.5
8 (19-25 Feb)	29.0	11.4	83	30	0.2	3.5	3.0	8.7
9 (26-04 Mar)	29.1	13.4	83	41	7.0	3.5	3.3	8.3
10 (05-11 Mar)	30.3	12.6	81	31	-	3.3	2.4	7.7
11 (12-18 Mar)	34.5	14.2	80	25	-	4.6	2.4	9.0
12 (19-25 Mar)	36.8	18.2	75	20	-	4.6	1.8	7.5
13 (26-01 Apr)	38.4	16.0	68	13	-	5.6	2.2	7.7

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
14 (02-08 Apr)	39.8	16.6	66	15	-	5.5	1.9	8.6
15 (09-15 Apr)	40.6	20.4	58	18	0.2	5.6	2.3	7.7
16 (16-22 Apr)	40.7	21.8	46	20	-	7.4	3.9	8.4
17 (23-29 Apr)	40.3	19.8	58	19	-	7.0	2.8	9.4
<b>JUNAGARH</b>	<b>Latitude 21<sup>o</sup>31' N</b>		<b>Longitude 70<sup>o</sup>33' E</b>		<b>Height above MSL 83 m</b>			
40 (01-07 Oct)	33.1	25.1	86	61	16.7			8.3
41 (08-14 Oct)	34.1	24.3	81	68	60.9			6.1
42 (15-21 Oct)	34.5	20.2	72	35	-			9.5
43 (22-28 Oct)	33.1	20.2	78	39	-			9.8
44 (29-04 Nov)	33.9	16.2	69	32	-			9.5
45 (05-11 Nov)	33.7	17.4	63	28	-			5.5
46 (12-18 Nov)	32.8	15.9	68	35	-			6.9
47 (19-25 Nov)	32.7	20.8	73	49	-			4.1
48 (26-02 Dec)	32.1	16.2	77	49	-			6.0
49 (03-09 Dec)	28.6	16.8	70	45	-			2.8
50 (10-16 Dec)	29.9	15.4	59	35	-			7.1
51 (17-23 Dec)	28.6	10.9	60	32	-			8.3
52 (24-31 Dec)	27.9	14.8	77	48	-			7.1
1 (01-07 Jan)	29.2	15.9	87	55	-			5.5
2 (08-14 Jan)	24.7	9.4	75	35	-			8.5
3 (15-21 Jan)	29.2	12.8	83	42	-			8.8
4 (22-28 Jan)	26.7	10.1	76	31	-			7.8
5 (29-04 Feb)	30.2	12.6	83	33	-			9.1
6 (05-11 Feb)	29.0	14.3	74	42	-			8.9
7 (12-18 Feb)	31.3	12.7	73	33	-			9.4
8 (19-25 Feb)	33.4	15.5	68	26	-			10.0
9 (26-04 Mar)	34.5	17.1	61	21	-			10.1
10 (05-11 Mar)	36.0	18.8	49	20	-			9.5
11 (12-18 Mar)	40.0	22.2	50	18	-			10.1
12 (19-25 Mar)	38.7	22.4	58	22	-			8.3
13 (26-01 Apr)	40.3	21.5	76	17	-			8.8
14 (02-08 Apr)	41.5	22.3	67	17	-			9.3
15 (09-15 Apr)	41.4	23.1	78	21	-			9.5
16 (16-22 Apr)	39.9	23.7	84	24	-			8.5
<b>POWARKHEDA</b>	<b>Latitude 22<sup>o</sup>44' N</b>		<b>Longitude 77<sup>o</sup>42' E</b>		<b>Height above MSL 299 m</b>			
40 (01-07 Oct)	35.6	22.8	-	-	4.6	3.5		
41 (08-14 Oct)	35.6	18.5	-	-	0	4.0		
42 (15-21 Oct)	34.3	15.5	-	-	39.2	-2.6		
43 (22-28 Oct)	33.6	13.5	-	-	-	4.3		
44 (29-04 Nov)	32.3	10.5	-	-	-	3.4		
45 (05-11 Nov)	31.5	9.5	-	-	-	3.2		
46 (12-18 Nov)	31.6	10	-	-	-	2.6		
47 (19-25 Nov)	32.1	14.9	-	-	-	3.8		
48 (26-02 Dec)	30.6	9.8	-	-	-	3.0		
49 (03-09 Dec)	30.4	13	-	-	-	2.6		
50 (10-16 Dec)	29.8	9.9	-	-	-	2.7		
51 (17-23 Dec)	29.6	2	-	-	-	2.1		
52 (24-31 Dec)	27.5	6.9	-	-	-	1.9		
1 (01-07 Jan)	26.3	7.4	95	50	-	2.0		
2 (08-14 Jan)	26.3	7	98	55	5	2.0		
3 (15-21 Jan)	26.5	5.4	96	46	-	1.9		
4 (22-28 Jan)	26.9	2.9	100	41	3.2	2.3		
5 (29-04 Feb)	26.3	2.9	95	29	-	2.8		
6 (05-11 Feb)	12	6.2	95	31	-	3.2		
7 (12-18 Feb)	13.6	5.4	89	31	-	3.7		
8 (19-25 Feb)	16.4	10.6	94	26	-	4.0		
9 (26-04 Mar)	29.9	10	96	39	-	4.0		

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
10 (05-11 Mar)	33.9	10.2	96	27	-	3.7		
11 (12-18 Mar)	40.2	11.2	94	19	-	4.5		
12 (19-25 Mar)	40.6	16.1	79	16	-	4.9		
13 (26-01 Apr)	41.5	13.1	71	15	-	7.8		
14 (02-08 Apr)	42.1	16.5	79	13	-	7.4		
15 (09-15 Apr)	43.2	19.7	67	12	-	7.9		
16 (16-22 Apr)	43.2	20	63	13	-	8.7		
17 (23-29 Apr)	44.5	20	61	15	-	9.5		
<b>UDAIPUR</b>	<b>Latitude 24<sup>o</sup>35' N</b>		<b>Longitude 73<sup>o</sup>42' E</b>			<b>Height above MSL 582 m</b>		
40 (01-07 Oct)	31.2	20.4	95.3	75.1	3.3	3.5	2.4	5.9
41 (08-14 Oct)	32.9	19.6	91.9	65.1	1.8	4.3	2.3	6.5
42 (15-21 Oct)	30.9	15.0	86.7	69.3	6.6	3.9	2.2	7.1
43 (22-28 Oct)	29.9	13.8	90.9	72.2	-	4.2	3.1	8.0
44 (29-04 Nov)	30.4	9.4	85.1	45.4	-	4.1	2.8	8.7
45 (05-11 Nov)	29.6	8.5	87.9	52.9	-	3.8	2.4	8.0
46 (12-18 Nov)	27.5	7.4	93.3	62.7	12.0	3.1	2.7	6.4
47 (19-25 Nov)	24.9	12.5	94.9	58.7	170.8	1.9	2.3	5.0
48 (26-02 Dec)	27.0	10.3	95.1	57.6	-	2.8	2.4	6.5
49 (03-09 Dec)	23.6	9.4	95.0	59.6	-	1.4	2.0	4.6
50 (10-16 Dec)	25.0	6.5	95.9	55.3	-	1.5	1.7	6.1
51 (17-23 Dec)	23.6	3.3	92.3	51.1	-	1.1	2.5	7.7
52 (24-31 Dec)	23.6	7.9	94.4	59.4	18.0	1.5	2.6	6.9
1 (01-07 Jan)	23.3	8.9	94.4	69.0	4.8	1.1	2.4	6.0
2 (08-14 Jan)	20.9	3.9	95.7	53.1	-	0.8	2.8	8.8
3 (15-21 Jan)	23.6	3.9	96.0	61.9	-	0.6	2.3	8.2
4 (22-28 Jan)	21.6	3.3	92.6	64.0	-	0.9	3.9	8.8
5 (29-04 Feb)	27.0	4.2	89.3	59.7	-	1.1	3.5	8.5
6 (05-11 Feb)	25.9	5.1	92.0	69.1	-	1.0	3.1	8.8
7 (12-18 Feb)	26.7	5.1	95.3	66.7	-	1.1	2.6	8.7
8 (19-25 Feb)	30.0	7.6	86.1	57.9	-	3.4	3.7	9.4
9 (26-04 Mar)	30.1	8.9	90.4	70.6	-	3.9	2.5	8.2
10 (05-11 Mar)	31.4	12.4	82.7	48.0	3.5	4.3	2.8	7.5
11 (12-18 Mar)	36.3	12.3	59.3	17.1	-	5.9	2.4	8.3
12 (19-25 Mar)	37.7	13.1	48.8	19.9	-	6.2	3.7	7.3
13 (26-01 Apr)	38.0	12.0	45.6	14.9	-	6.3	3.4	8.4
14 (02-08 Apr)	39.7	13.4	46.0	10.4	-	6.5	2.7	8.4
15 (09-15 Apr)	40.0	17.0	48.7	12.1	-	8.8	5.2	8.8
16 (16-22 Apr)	40.3	20.5	33.4	14.0	-	10.7	6.9	8.8
17 (23-29 Apr)	40.2	19.4	32.7	13.4	-	11.0	4.6	10.2
<b>VIJAPUR</b>	<b>Latitude 23<sup>o</sup>15' N</b>		<b>Longitude 72<sup>o</sup>55' E</b>			<b>Height above MSL 126 m</b>		
40 (01-07 Oct)	33.7	23.4	94.0	90.1	-			
41 (08-14 Oct)	34.8	22.0	87.7	84.8	-			
42 (15-21 Oct)	34.9	17.7	88.5	77.5	-			
43 (22-28 Oct)	32.2	16.8	83.1	87.2	-			
44 (29-04 Nov)	30.5	13.6	76.7	58.0	-			
45 (05-11 Nov)	33.0	12.3	84.5	81.0	-			
46 (12-18 Nov)	30.4	13.8	82.1	91.2	31.6			
47 (19-25 Nov)	30.0	14.1	88.0	85.0	-			
48 (26-02 Dec)	29.6	14.1	90.5	85.5	-			
49 (03-09 Dec)	28.3	13.6	82.8	69.3	-			
50 (10-16 Dec)	27.2	10.2	87.0	80.7	-			
51 (17-23 Dec)	27.3	6.0	86.6	90.5	-			
52 (24-31 Dec)	27.3	7.7	82.7	87.4	-			
1 (01-07 Jan)	26.6	13.1	92.3	90.5	-			
2 (08-14 Jan)	26.8	4.8	89.4	79.4	-			
3 (15-21 Jan)	26.8	7.7	85.1	80.7	-			
4 (22-28 Jan)	25.1	6.3	90.1	78.5	-			

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall mm	Pan-E mm	Wind Speed km/hr	Sunshine hrs/day
	Max	Min	Max	Min				
5 (29-04 Feb)	26.9	7.8	89.2	81.5	-			
6 (05-11 Feb)	27.6	8.6	85.2	80.5	-			
7 (12-18 Feb)	30.1	10.0	91.0	82.5	-			
8 (19-25 Feb)	31.4	9.6	89.4	84.5	-			
9 (26-04 Mar)	30.0	9.8	86.1	76.5	-			
10 (05-11 Mar)	35.3	12.8	87.2	74.1	-			
11 (12-18 Mar)	38.4	17.4	74.0	63.8	-			
12 (19-25 Mar)	37.1	17.4	79.4	61.5	-			
13 (26-01 Apr)	38.2	15.9	81.8	72.7	-			
14 (02-08 Apr)	33.7	23.4	94.0	90.1	-			
15 (09-15 Apr)	34.8	22.0	87.7	84.8	-			
16 (16-22 Apr)	34.9	17.7	88.5	77.5	-			

## PENINSULAR ZONE

AKOLA	Latitude 20 <sup>o</sup> 70' N		Longitude 77 <sup>o</sup> 03' E		Height above MSL 282 m			
40(01-07 Oct)	32.5	23.3	92	64	17.1		0.5	7.4
41(08-14 Oct)	34.3	22.3	88	43	-		0.9	7.8
42(15-21 Oct)	31.4	19.8	83	51	54.9		2.2	6.3
43(22-28 Oct)	31.7	16.2	83	40	-		0.2	8.9
44(29-04 Nov)	31.2	13.5	80	36	-		0.4	8.3
45(05-11 Nov)	31.3	13.8	81	32	-		0.7	7.8
46(12-18 Nov)	31.3	19.1	77	49	-		1.4	5.9
47(19-25 Nov)	32.1	20.4	86	51	1.4		2.1	5.4
48(26-02 Dec)	30.5	14.5	73	29	-		1.2	6.8
49(03-09 Dec)	28	15.8	85	44	-		0.8	3.2
50(10-16 Dec)	29.1	13.4	79	36	-		1.4	6.3
51(17-23 Dec)	27.6	8.8	83	29	-		0.6	7
52(24-31 Dec)	27.2	12.5	87	50	42.6		1.2	5.5
1(01-07 Jan)	26.7	13.2	92	47	-		0.7	5.6
2(08-14 Jan)	25.7	14.6	87	62	-		1.3	3.9
3(15-21 Jan)	26.1	11.4	90	46	1		1.2	6.5
4(22-28 Jan)	25.3	8.4	75	34	-		2.3	7.9
5(29-04 Feb)	28.5	8.8	74	25	-		1.3	8.8
6(05-11 Feb)	29.8	9.4	68	27	-		1.6	8.4
7(12-18 Feb)	29.9	12.9	72	30	-		2	8.2
8(19-25 Feb)	33.8	14.5	72	23	-		2.1	8.1
9(26-04 Mar)	35.1	16.6	65	22	-		2.5	7.5
10(05-11 Mar)	34.1	17.2	74	28	-		2	6.4
11(12-18 Mar)	37.5	16.3	59	19	-		1.5	8.8
12(19-25 Mar)	40.7	20.9	66	14	-		1.6	7.3
13(26-01 Apr)	41.1	21.5	44	10	-		2.6	8.5

DHARWAD	Latitude 15 <sup>o</sup> 26'N		Longitude 75 <sup>o</sup> 07' E		Height above MSL 678 m			
40(01-07 Oct)	30.9	21.1	87	80	39.8			
41(08-14 Oct)	29.2	20.9	91	75	25.0			
42(15-21 Oct)	30.6	19.6	83	61	-			
43(22-28 Oct)	29.8	18.5	77	62	33.4			
44(29-04 Nov)	29.4	19.7	83	64	3.8			
45(05-11 Nov)	28.9	17.4	81	73	28.4			
46(12-18 Nov)	28.2	20.2	89	76	64.8			
47(19-25 Nov)	26.7	19.9	94	87	59.2			
48(26-02 Dec)	31.3	17.6	87	67	14.8			
49(03-09 Dec)	28.7	16.8	83	69	12.6			
50(10-16 Dec)	27.3	15.6	87	66	-			
51(17-23 Dec)	27.2	11.0	74	53	-			
52(24-31 Dec)	29.0	13.2	83	51	-			
1(01-07 Jan)	27.7	12.9	79	55	-			

Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
2(08-14 Jan)	27.7	12.5	83	60	-			
3(15-21 Jan)	28.5	13.7	80	49	-			
4(22-28 Jan)	28.3	13.6	79	50	-			
5(29-04 Feb)	31.3	14.3	70	39	-			
6(05-11 Feb)	31.3	14.6	78	37	-			
7(12-18 Feb)	31.3	15.2	53	36	-			
8(19-25 Feb)	33.4	16.2	52	25	-			
9(26-04 Mar)	33.6	15.3	40	19	-			
10(05-11 Mar)	33.6	18.0	52	24	-			
11(12-18 Mar)	35.5	19.7	65	26	-			
12(19-25 Mar)	33.0	20.2	85	64	34.8			
13(26-01 Apr)	36.2	20.5	85	43	14.0			
14 (02-08 Apr)	35.4	20.8	78	42	8.4			
15 (09-15 Apr)	33.5	21.7	85	59	33.4			
16 (16-22 Apr)	34.7	20.5	68	69	50.4			
17 (23-29 Apr)	34.6	21.1	62	44	19.0			
<b>NIPHAD</b>	<b>Latitude 20.6<sup>o</sup> N</b>		<b>Longitude 74.6<sup>o</sup> E</b>		<b>Height above MSL 548.6 m</b>			
40(01-07 Oct)	28.2	20.7	91.3	75.7	37.9	0	4.1	1.2
41(08-14 Oct)	29.1	20.7	90.7	72.1	30.8	0	2.6	1
42(15-21 Oct)	30.5	21.4	79.6	65.6	-	3.2	3.7	5.3
43(22-28 Oct)	30.4	17.8	91.3	72.3	-	5.3	2.1	8.1
44(29-04 Nov)	30.1	16.7	89	71	-	5	1.4	7.9
45(05-11 Nov)	29.7	15.9	89	69	-	5.2	1.7	7.6
46(12-18 Nov)	29.6	14.7	81	54	-	5.3	2	8.3
47(19-25 Nov)	29.3	17.7	86	63	3.4	2.2	2.2	6.7
48(26-02 Dec)	28.5	16.3	84	54	40.2	2.3	2.4	4
49(03-09 Dec)	27.5	16.2	84	60	6	0.8	1.8	5.1
50(10-16 Dec)	27.1	13.1	80	45	-	1.8	2.3	6.4
51(17-23 Dec)	26.9	9.7	81	43	-	2.3	1.3	7.9
52(24-31 Dec)	27.5	8.3	78	51	-	0.9	2.9	8
1(01-07 Jan)	26.8	11.4	77	50	-	0.7	2.2	6.5
2(08-14 Jan)	25.5	9.7	80	52	-	1.3	3	7.3
3(15-21 Jan)	26.8	9.6	80	52	-	2.3	2.2	8.9
4(22-28 Jan)	24	6.3	80	44	-	2.2	4.3	8.4
5(29-04 Feb)	28.9	6	77	29	-	2.8	2.3	9
6(05-11 Feb)	29	7.2	77	36	-	1.7	2.2	7.7
7(12-18 Feb)	28.8	9.4	78	42	-	2.7	2.3	8.6
8(19-25 Feb)	31.3	8.7	80	29	-	4.3	1.5	8.9
9(26-04 Mar)	32.8	10.9	77.7	25.4	-	4.3	1.3	7.9
10(05-11 Mar)	30.8	13	79.7	43.7	13.2	0.7	2.9	4.2
11(12-18 Mar)	33.9	12.1	84.6	39.1	-	4.2	1.8	8.8
12(19-25 Mar)	36.9	16.8	80.6	43.1	-	3.8	1.9	8.3
13(26-01 Apr)	37.9	13.3	90.3	27.9	-	6.4	2.8	9
14(02-08 Apr)	39.1	15.6	91.3	36.4	-	9.9	3	9.5
15(09-15 Apr)	39.1	18.3	89.7	37.3	-	9.2	4.3	8.6
16(16-22 Apr)	38	17.9	85.7	29.6	-	6.4	6.5	8.2
17(23-29 Apr)	39.3	19.5	75.4	26.1	-	8.2	3.4	9.4
18(30-06 May)	38.6	20.6	81.4	25.9	-	8.2	9.0	9.2
<b>PUNE</b>	<b>Latitude 18<sup>o</sup>04' N</b>		<b>Longitude 74<sup>o</sup>21' E</b>		<b>Height above MSL 548.6 m</b>			
40(01-07 Oct)	32.8	21.8	94	76	56.4			
41(08-14 Oct)	31.4	21.3	94	67	70.2			
42(15-21 Oct)	33.0	19.2	92	47	-			
43(22-28 Oct)	31.6	18.7	87	44	-			
44(29-04 Nov)	31.1	18.5	87	57	129.2			
45(05-11 Nov)	30.7	16.6	85	47	-			
46(12-18 Nov)	30.8	20.8	86	63	12.8			
47(19-25 Nov)	30.2	21.8	97	80	12.4			



Julian weeks	Temperature <sup>o</sup> C		RH (%)		Rainfall	Pan-E	Wind Speed	Sunshine
	Max	Min	Max	Min	mm	mm	km/hr	hrs/day
48(26-02 Dec)	27.7	16.4	90	67	22.0			
49(03-09 Dec)	27.9	16.1	96	64	22.0			
50(10-16 Dec)	28.3	15.7	93	53	-			
51(17-23 Dec)	28.2	15.3	96	59	-			
52(24-31 Dec)	28.4	15.5	95	56	-			
1(01-07 Jan)	29.2	14.4	97	46	-			
2(08-14 Jan)	27.3	13.3	98	47	-			
3(15-21 Jan)	28.3	12.8	96	53	-			
4(22-28 Jan)	26.1	11.3	89	43	-			
5(29-04 Feb)	30.8	10.3	85	27	-			
6(05-11 Feb)	30.6	11.3	91	34	-			
7(12-18 Feb)	30.8	13.2	88	38	-			
8(19-25 Feb)	33.9	14.4	89	39	-			
9(26-04 Mar)	34.6	15.2	84	26	-			
10(05-11 Mar)	33.5	17.7	77	33	-			
11(12-18 Mar)	36.5	15.3	75	26	-			
12(19-25 Mar)	36.8	21.8	84	30	-			
13(26-01 Apr)	38.4	18.7	76	23	-			
14(02-08 Apr)	38.9	20.4	82	25	-			
15(09-15 Apr)	38.3	23.3	77	26	-			
16 (16-22 Apr)	38.4	22.6	75	25	-			
17 (23-29 Apr)	38.9	22.7	80	37	0.3			

## SOIL PHYSICO-CHEMICAL PROPERTIES

Name of Centre	Textural class	Sand %	Silt %	Clay %	Db Mg m <sup>-3</sup>	FC %	PWP %	OC %	Avail. N kg/ha	Avail. P kg/ha	Avail. K kg/ha	pH	EC dsm <sup>-1</sup>
<b>NORTHERN HILLS ZONE</b>													
Almora								0.8				6.9	
Bajaura	Silty Loam	28.2	53.4	18.4	1.57	NA	NA	0.57	334	46	257	6.6	0.625
Malan					1.54	31.0	13.8	0.79	329.7	41.6	245.7	5.4	0.165
<b>NORTH WESTERN PLAINS ZONE</b>													
Delhi	Sandy Loam	60.18	14.88	24.94	1.264	23.56	9.7	0.416	263	10.94	307	7.48	0.13
Gurdaspur	Sandy Loam	80.77	10.4	7.82	1.53	10.4	3.2	0.27	128.64	17.4	88.3	7.43	0.11
Gwalior	Sandy clay loam	62.4	17.2	20.4	-	-	-	0.46	180	12.5	200	7.4	-
Hisar	Sandy loam	72.0	18.5	9.5	1.40	-	-	0.34	147	16.9	270	7.7	0.22
Jammu	Clay Loam	41.3	30.5	28.2	1.44	21.1	-	0.42	173.1	15	137.6	7.24	0.21
Karnal	Sandy Loam	42.5	30.8	26.7	1.46	20.5	-	0.47	189.60	16.5	171.7	8.16	0.23
Ludhiana	Loamy sand	83.5	7.9	8.5	1.46	-	-	0.57	-	28.6	56.0	7.8	0.16
Pantnagar	Loam	36.0	47.5	16.5	1.4	22.7	8.3	0.7	225.8	41.7	145.0	7.3	0.40
Sriganganagar	Sandy Loam	36.0	47.6	16.4	1.55	16.3	-	0.21	-	36.0	340.0	8.1	0.29
<b>NORTH EASTERN PLAINS ZONE</b>													
Burdwan	-	--	-	-	-	-	-	0.56	-	-	250	6.28	0.13
Coochbehar	Sandy Loam	63	25	12	1.38			0.84	201.8	42.3	142.9	5.90	-
IARI Pusa	Sandy	33.2	58.5	8.3				0.43		11.6	139	8.6	0.27
Kalyani	Loamy	46.18	29.6	24.22	1.83	34	13	0.57	281.4	20.31	298.47	7.2	0.37
Kanpur		51	35	14				0.39		17.0	176.5	7.7	0.20
Ranchi	clay loam	33.3	30.7	36.03	1.41	26.97	14.07	0.49	225	14.53	200.8	6.3	-
RP CAU Pusa	Sandy Loam	58	30	12	1.41			0.42	226	25.5	145	8.3	0.4
Sabour	Loamy clay	25.3	43.8	33.5	1.50	23	12	0.5	215.5	25	196	7.2	0.1
Shillongani	Sandy Clay Loam	51.6	22.1	26.6	1.4	42.3	7.1	1.2	242.4	16.6	267.4	5.5	0.28
Varanasi	Sandy Clay Loam	51.6	23.7	24.6	1.38	19.76	5.66	0.41	182.8	24.16	199.2	7.34	0.35
<b>CENTRAL ZONE</b>													
Bilaspur	Sandy clay loam	41.14	21.76	36.11	1.31	21.26	8.6	0.39	276	12.7	287	7.3	0.16
Dhanduka	Black cotton	28.2	37.3	34.5	-	-	-	0.58	221	5.46	375	8.1	0.15
Durgapura	Loamy Sand	81	9.4	7.6	1.53	11.23	3.15	0.24	187	27.66	232	8.1	0.26
Indore	Vertisols	18.1	25.1	56.8	1.43	38	15	0.48	243	15.8	432	8.2	0.23
Jabalpur	Vertisols	25.15	18.52	55.67	1.33	39-42	28.3	0.61	282	16.66	310	7.2	0.33
Junagadh	Medium Black	35.83	31.38	32.79	1.35	-	-	0.93	301	32.54	275	8.08	0.11
Powarkheda	-	26	24.5	47.5	1.53	-	-	0.48	285	32.15	351	7.5	0.39
Udaipur	Clay- loam	38.75	26.78	34.47	1.46			0.55	288	23.67	365	8.02	0.9
Vijapur-I	Sandy Loam	80.00	6.00	5.80	1.57	9.76	3.75	0.37	169	42.89	280	7.64	0.32
Vijapur-II	Sandy Loam	81.00	6.00	5.70	1.54	9.71	3.58	0.33	157	40.79	274	7.58	0.33
<b>PENINSULAR ZONE</b>													
Akola	Clay	11.4	29.7	58.9	-	-	-	0.27	112.9	25.0	164.6	7.83	0.17
Dharwad	Clay	20	26	50	1.2-1.3	32-35	16-18	0.3-0.5	230-268	29-42.8	378-418	7.2-7.8	0.2-0.3
Niphad	Clay	20.4	34.2	45.4	1.29	-	-	0.62	157.42	23.61	304.45	8.24	0.27
Pune	Clay	5.7-9.6	48.8-63.4	12.8-24.2	1.28-1.38	-	-	0.61-0.94	147-226	9.87-14.1	411-939	8.21-8.57	0.43-0.76

**SOWING DATES FOR DIFFERENT ZONES UNDER IRRIGATED CONDITIONS**

<b>ZONE</b>	<i>Triticum aestivum</i>	<i>Triticum durum</i>
<b>NORTHERN HILLS ZONE</b>		
Timely	5 <sup>th</sup> Nov. to 11 <sup>th</sup> Nov.	
Late	26 <sup>th</sup> Nov. to 2 <sup>nd</sup> Dec.	
Very Late	17 <sup>th</sup> Dec. to 23 <sup>rd</sup> Dec.	
<b>NORTH WESTERN PLAINS ZONE</b>		
Timely	5 <sup>th</sup> Nov. to 11 <sup>th</sup> Nov.	29 <sup>th</sup> Oct. to 4 <sup>th</sup> Nov.
Late	10 <sup>th</sup> Dec. to 16 <sup>th</sup> Dec.	26 <sup>th</sup> Nov. to 2 <sup>nd</sup> Dec.
Very Late	1 <sup>st</sup> Jan. to 7 <sup>th</sup> Jan.	
<b>NORTH EASTERN PLAINS ZONE</b>		
Timely	12 <sup>th</sup> Nov. to 18 <sup>th</sup> Nov.	
Late	10 <sup>th</sup> Dec. to 16 <sup>th</sup> Dec.	
Very Late	1 <sup>st</sup> Jan. to 7 <sup>th</sup> Jan.	
<b>CENTRAL ZONE</b>		
Timely	12 <sup>th</sup> Nov. to 18 <sup>th</sup> Nov.	5 <sup>th</sup> Nov. to 11 <sup>th</sup> Nov.
Late	3 <sup>rd</sup> Dec. to 9 <sup>th</sup> Dec.	
Very Late	24 <sup>th</sup> Dec. to 31 <sup>st</sup> Dec.	
<b>PENINSULAR ZONE</b>		
Timely	5 <sup>th</sup> Nov. to 11 <sup>th</sup> Nov.	5 <sup>th</sup> Nov. to 11 <sup>th</sup> Nov.
Late	26 <sup>th</sup> Nov. to 2 <sup>nd</sup> Dec.	
Very Late	17 <sup>th</sup> Dec. to 23 <sup>rd</sup> Dec.	
<b>SOUTHERN HILLS ZONE</b>		
Timely	26 <sup>th</sup> Nov. to 2 <sup>nd</sup> Dec.	
Late	24 <sup>th</sup> Dec. to 31 <sup>th</sup> Dec.	

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\* **Funded Centres**



## 61<sup>st</sup> All India Wheat and Barley Research Workers' Meet

(August 29-31, 2022)

Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Gwalior (MP)

## 61<sup>वीं</sup> अखिल भारतीय गेहूँ एवं जौ अनुसंधान कार्यकर्ता गोष्ठी

(29-31 अगस्त, 2022)

राजमाता विजयाराजे सिंधिया कृषि विश्वविद्यालय, ग्वालियर (मध्य प्रदेश)

