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**All India Coordinated Wheat and Barley Improvement Project**

**PROGRESS REPORT  
2013-14**

**Vol. IV**

**WHEAT QUALITY**

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**(R.K. Gupta)**  
**PI, Quality**

## Detail of samples in Advance Varietal Trials

Station	Zone	Condition	No. of Samples	
			<i>T. aestivum</i>	<i>T. durum</i>
Almora	NHZ	ITS, RTS, RES, RILS	78	--
Shimla	NHZ	ITS, RTS, RES, RILS	78	--
Malan	NHZ	ITS, RTS, RES, RILS	78	--
Ludhiana	NWPZ	ITS, ILS, RTS, RITS	92	10
Hisar	NWPZ	ITS, ILS, RTS, RITS	92	10
Delhi	NWPZ	ITS, ILS, RTS, RITS	92	10
Pantnagar	NWPZ	ITS, ILS, RITS	82	10
Durgapura	NWPZ	ITS, ILS	66	10
Kanpur	NEPZ	ITS, ILS, RTS	64	--
Pusa	NEPZ	ITS, ILS, RTS	64	--
Sabour	NEPZ	ITS, ILS, RTS	64	--
Vijapur	CZ	ITS, ILS	20	14
Junagarh	CZ	ITS, ILS	20	14
Powerkheda	CZ	ITS, ILS	20	14
Kota	CZ	ITS, ILS, RTS, RITS	50	28
Indore	CZ	ITS, ILS, RTS, RITS	50	28
Pune	PZ	ITS, ILS	18	8
Dharwad	PZ	ITS, ILS, RTS	28	18
Niphad	PZ	ITS, ILS	18	8
Wellington	SHZ	RITS, ILS	20	--
Ooty	SHZ	RITS	10	--
Kodai Kanal	SHZ	RITS	10	--
<b>Total</b>			<b>1114</b>	<b>182</b>

## Detail of samples in National Initial Varietal Trials

Trial	Condition	Samples Size	Zone	Station	Total Samples
NIVT 1A	ITS	98	NWPZ	Ludhiana, Delhi, Hisar, Pantnagar, Durgapura	490
			NEPZ	Pusa, Sabour, Kanpur	294
NIVT 1B	ITS	98	NWPZ	Ludhiana, Delhi, Hisar, Pantnagar, Durgapura	490
			NEPZ	Kanpur, Samastipur, Sabour	294
NIVT 2	ITS	72	CZ	Indore, Kota, Vijapur, Junagarh, Powarkheda	360
			PZ	Pune, Dharwad, Niphad	216
NIVT 3	ILS	98	NWPZ	Ludhiana, Hisar, Pantanagar, Delhi, Durgapura	490
			NEPZ	Samastipur, Sabour, Kanpur	294
			CZ	Indore, Vijapur, Junagarh, Powarkheda	392
			PZ	Pune, Niphad	196
NIVT 4	ITS	72	NWPZ	Ludhiana, Hisar, Durgapura, Delhi	288
			CZ	Indore, Kota, Vijapur, Junagarh, Powarkheda	260
			PZ	Dharwad, Niphad	216
NIVT 5A	RTS	72	NWPZ	Ludhiana, Delhi	144
			NEPZ	Kanpur, Sabour, Pusa	216
			CZ	Kota	72
			PZ	Niphad, Dharwad	144
NIVT 5B	RITS	72	CZ	Indore, Kota	144
	RTS	50	CZ	Dhanduka, P'Kheda, Kota	150
			PZ	Dharwad, Niphad, Annigeri	150
	RITS	50	CZ	Indore, Kota	100
IVT	ITS	48	NHZ	Almora, Shimla, Malan	144
	RTS	48	NHZ	Almora, Shimla, Malan	144
	ITS	34	SHZ	Wellington (2), Ooty, Kodai Kanal	136
<b>Total</b>					<b>5924</b>

## Detail of samples in Special Trials

<i>T. dicoccum</i>	ITS	22	PZ	Arabhavi, Dharwad, Pune, Ugar, Kalloli, Mudhol	132
<i>Salinity/alkalinity</i>	ITS	14	NWPZ	Hisar, Karnal	28
			NEPZ	Kanpur, Faizabad	28
<i>Triticale</i>	ITS	16	NWPZ	Ludhiana, Delhi	32
<i>MABB/NIL</i>	ITS	14	NWPZ	Ludhiana, Delhi, Karnal	42
		10	NEPZ	Kanpur, Pusa, Varanasi	30
		12	CZ	Indore, Powarkheda, Vijapur	36
		12	PZ	Pune, Dharwad	24
<i>Biofortification</i>	ITS	44	NWPZ	Ludhiana, Durgapura, Delhi, Karnal, Hisar	220
			NEPZ	Kanpur, Varanasi	88
			PZ	Niphad	44
<b>Total</b>					<b>704</b>

## Detail of Samples in Nurseries

<b>QCSN</b>	ITS	110	NHZ	Almora,	<b>110</b>
			NWPZ	Ludhiana, Durgapura, Delhi, Pantnagar, Karnal	<b>650</b>
			NEPZ	Kanpur, Pusa	<b>220</b>
			CZ	Indore, Junagarh	<b>220</b>
			PZ	Pune, Dharwad	<b>220</b>
<b>National Wheat Nurseries</b>					
NGSN					<b>210</b>
EIGN-I					<b>92</b>
EIGN-II					<b>66</b>
<b>Total</b>					<b>1788</b>
<b>Grand Total</b>					<b>9602</b>

## Detail of FCI Wheat Grain Samples

<b>State (No. of Samples)</b>	<b>Total Samples</b>
Punjab (857), Haryana (345) and Madhya Pradesh (1049)	<b>2251</b>

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## **ADVANCE VARIETAL TRAILS**

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# ADVANCED VARIETAL TRIALS (*Triticum aestivum*)

## GRAIN CHARACTERISTICS

The *triticum aestivum* entries were tested under Irrigated Timely Sown (ITS), Irrigated Late Sown (ILS) and Rainfed Timely Sown (RTS) conditions of North Western Plains Zone (NWPZ) and North Eastern Plains Zone (NEPZ), Central Zone (CZ) & Peninsular Zone (PZ). In Northern Hills Zone (NHZ), the entries were also tested under Rainfed Early Sown (RES) condition. Similarly, the entries were also tested under Restricted Irrigation Timely Sown (RITS) condition in NWPZ and CZ. In Southern Hills Zone (SHZ), the entries were tested only under TS, LS and RITS condition.

### (i) Grain Appearance Score (Table 1-6)

It is a subjective test and an important parameter in grain trade and for this grain size, shape, soundness, colour & lustre are collectively taken into consideration to judge the grain appearance out of total score of 10.0. Same set of entries was planted under ITS & RTS conditions of NHZ. The zonal means were 5.8 and 5.7 respectively. Some of the 1st year entries viz. HS 595 (6.2) and VL 1004 (6.6) had better grain appearance compared to the best check, VL 829 (6.0) under RES condition. Likewise, 1st year entries VL 3002 (6.0) and VL 3005 (6.4) were found better than the best check, VL 892 (5.9) in RILS condition.

Under ITS condition of NWPZ, all the entries including checks scored >6.0. However, two 1st year entries viz. WH 1154 and K 1204 were found comparable to the best check, HD 3086 (6.5). The zonal mean was 6.2. Similar was the situation in remaining sowing conditions i.e. ILS, RTS and RITS.

In all the three sowing conditions i.e. ITS, ILS and RTS, most of entries recorded >6.0 score but none could beat the respective best checks and the zonal means were 6.2, 5.9 and 6.3 respectively.

The grain appearance was comparatively better under all the conditions of CZ. The zonal means were 7.0, 7.1, 6.8, and 6.9 under ITS, ILS, RTS and RITS conditions respectively.

In PZ, the grain appearance was comparatively better under RTS condition where the 2nd year entry, NIAW 1994 (7.6) and 1st year entry, NIAW 2030 (8.4) had an edge over the best check, NIAW 1415 (7.4).



In SHZ, though none of the 1<sup>st</sup> year entry could beat the best check, HW 2044 (7.1) but the zonal mean was reasonably good (6.9).

## **(ii) Test Weight (Table 7-12)**

This parameter merits consideration for millers as it is positively correlated with flour recovery. Bread wheat with 76.4 kg/hl and above test weight is classified in grade-I in U.S. system of grain trading. In Canadian system, the threshold value is 78.0 kg/hl. It is a very important parameter of wheat trading in the international market. Under ITS and RTS conditions, where same set of entries was tested, none of the entries could surpass their respective checks and the zonal means were 79.8 kg/hl and 78.6 kg/hl respectively. The 1<sup>st</sup> year entries, VL 1004 (81.5 kg/hl) in RES condition and HS 592 (80.5 kg/hl) under RILS conditions were found better than their respective best checks and the zonal means were 78.5 kg/hl and 78.0 kg/hl respectively.

Under ITS condition of NWPZ, three 1<sup>st</sup> year entries, WH 1154, WH 1157, K 1204 recorded higher values than the best check, WH 1105 (79.2 kg/hl). The zonal mean was 78.1 kg/hl. Under ILS, RTS and RITS conditions, none of the entry could beat their respective best checks and the zonal means were 78.4 kg/hl, 78.5 kg/hl and 78.7 kg/hl, respectively.

In NEPZ, the entries, PBW 677 under ITS condition, HD 3118 under ILS condition and BRW 3723 under RTS condition were comparable to their respective best checks and the zonal means were 80.1 kg/hl, 78.1 kg/hl and 80.6 kg/hl respectively.

The test weight values were comparatively higher in CZ. The zonal means of under all the four sowing condition were more than 82.0 kg/hl. Similar was the situation in PZ. The zonal means under all the three sowing conditions were nearly 81.0 kg/hl.

In SHZ, the 1<sup>st</sup> year entry, UAS 358 (81.4 kg/hl) recorded higher value compared to the best check, HW 5216 (80.9 kg/hl).

## **(iii) Protein Content (Table 13-18)**

It is an important parameter for making different products of bread wheat. The protein requirements are >12.0%, 10.0-12.0 and <10.0% for making good quality bread, chapatti and biscuit respectively. Under ITS & RTS conditions of NHZ, where same set of entries was tested, none of the entry could beat the respective

best checks and the zonal means were 9.55% and 9.36% respectively. Four out of eight 1<sup>st</sup> year entries recorded higher values compared to the best check, HPW 251 (10.09%) under RES condition. Except one 1<sup>st</sup> year entry, HPW 411 all others exhibited higher values compared to the best check, HPW 490 (9.45%) under RILS condition and the zonal mean was 9.86%.

Under ITS condition of NWPZ, three 1<sup>st</sup> year entries, PBW 692, TL 2995, HD 3132 recorded >12.0% protein and were found better than the best check, DPW 621-50 (11.97%) and the zonal mean was 11.62%. The contents were comparatively higher under ILS condition, where all the entries were comparable to the best check, HD 3059 (12.08%) and the zonal mean was 12.01%. None of the entry could surpass the respective best checks under ITS & RTS condition and the zonal means were 11.79% and 11.17% respectively.

In ITS condition of NEPZ, five out of eight 1<sup>st</sup> year entries recorded higher values compared to the best check, NW 5054 (11.09%). The 2<sup>nd</sup> year entry, DBW 107 (12.38%) and 1<sup>st</sup> year entry, PBW 704 (12.23%) were found better than condition. The zonal mean was 10.66% under RTS condition.

The 2<sup>nd</sup> year entry, MP 3382 (12.57%) recorded higher value compared to the best check, HI 1544 (11.33%) under ITS condition of CZ and the zonal mean was 11.31%. The content was higher under ILS condition and the zonal mean was 12.05%. The 1<sup>st</sup> year entry, CG 1010 (RTS condition) and 2<sup>nd</sup> year entry, DBW 110 (RITS condition) recorded >12.0% content and the zonal means were 11.30% and 11.38% respectively.

In general, the protein content was higher in PZ. The zonal means were 12.91%, 12.15% and 12.97% under ITS, ILS and RTS conditions respectively.

The 1<sup>st</sup> year entry, MACS 6507 (13.72%) recorded higher value compared to the best check, HW 5216 (12.93%) in SHZ and the zonal mean was 12.63.

#### **(iv) Grain Hardness Index (Table 19-24)**

Grain Hardness is an important parameter for making various wheat products, as hard wheat (>75 index) is required for making good bread & chapatti and soft wheat (<45 index) for good quality biscuit. 16.13% entries including checks recorded >75 index and only 1.89% entries namely HS 490, VL 3002 and WH 1164 had <45 index.

**(v) Sedimentation Value (Table 25-30)**

This quality parameter gives an idea of gluten strength. For making good quality bread, chapatti and biscuit, the required sedimentation values are >60 ml, 30 ml 60 ml and <30 ml respectively. Same set of entries were test under ITS and RTS condition of NHZ. The highest value was recorded by the check, HPW 349 and no entry was anywhere near to it. Under RES condition, the 2<sup>nd</sup> year entry, HPW 376 and 1<sup>st</sup> year entries, HPW 400, HPW 401 and HS 595 recorded more than 50.0 ml values which were higher than that of the best check, VL 829 (40 ml). Likewise, under RILS condition, the 1<sup>st</sup> year entries, HS 592 (56 ml) and HS 594 (61 ml) recorded higher value compared to the check, VL 892 (39 ml).

Under ITS condition of NWPZ, all the three 2<sup>nd</sup> year entries and 10 out of 15 1<sup>st</sup> year entries recorded >50 ml values and were found comparable to the best check, WH 1105. Likewise, one 2<sup>nd</sup> year entry and three 1<sup>st</sup> year entries recorded >50 ml values under ILS condition. Two 1<sup>st</sup> years entries under RTS condition and three under RITS condition were found comparable to the best check, WH 1080 (55 ml).

In NEPZ, three 1<sup>st</sup> year entries namely, PBW 677, WH 1132 and DBW 98 were found comparable to the best check, NW 5054 (52 ml) under ITS condition. Similarly, the 2<sup>nd</sup> year entry, HD 3118 & two 1<sup>st</sup> year entries (under ILS condition) and 2<sup>nd</sup> year entry, BRW 3723 & two 1<sup>st</sup> year entries (under RTS condition) recorded >50 ml values and were found comparable to their respective best checks.

The zonal means in all the four sowing conditions of CZ were about 45 ml. The 2<sup>nd</sup> year entry, DBW 110 (RITS condition) recorded >50 ml value.

In PZ, the zonal mean was comparatively higher under RTS condition (51 ml) compared to ITS (45 ml) and ILS (44 ml) conditions.

The 1<sup>st</sup> year entry, MACS 6507 (55 ml) recorded higher value than the best check, HW 2044 (43 ml) in SHZ.

**(vi) Moisture Content (Table 31-36)**

It is an important parameter from storage point of view and grain trading. It depends on the weather conditions at the time of harvesting and also at the time when the determination has been made. Higher moisture content adversely affects the keeping quality of wheat. Also, the protein content values mentioned previously are at 'as is' basis. Hence, moisture content merits consideration if protein is to be calculated on dry basis or any other given moisture content. The threshold value is 12.0%. All the entries in all the zones, centres and sowing conditions fulfilled this requirement except Shimla (NHZ, ITS), Sabour (NEPZ, RTS), Dharwad (PZ, ITS) and Ooty & Kodaikanal (SHZ, RITS).

**(vii) High Molecular Weight Glutenin Subunits (HMWGS) of *T. aestivum* AVTs (Table 37-42)**

One hundred fifty nine (159), 2<sup>nd</sup> and 1<sup>st</sup> year entries including checks were evaluated for HMWGS composition from various sowing conditions of different zones of the country. The number of units varied from 3 to 5 in each entry. The percent entries having 3, 4 and 5 subunits were 3.77%, 42.14% and 54.09% respectively. Maximum entries had 5 subunits in all the zones except NHZ and SHZ. Subunits 5+10 were present in 61.64% of the total entries whereas 2+12 in 38.36% entries. More number of entries had 5+10 subunits in NHZ, NWPZ, NEPZ and SHZ whereas in CZ and PZ, 2+12 subunits were more prevalent. Subunits 1, 2\* and N were present in 27.67%, 59.75% and 12.58% of the total entries respectively. Subunit 2\* was more prevalent in all the zones. The subunits 7, 7+8, 7+9, 17+18, 20 and 13+16 were present in 34.59%, 20.13%, 11.95%, 27.04%, 2.52% and 3.77% of the total entries respectively. Subunit 7 was more prevalent in NHZ and NWPZ. The percent entries having Glu-1 score 4, 5, 6, 7, 8, 9 and 10 were 3.14, 0.63, 10.06, 8.18, 48.43, 3.14 and 26.42 respectively. Maximum entries had Glu-1 score of 8 in all of the zones.

**Table 1: Grain Appearance (Max-10) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	5.6	6.2	6.2	<b>6.0</b>
2. VL 804 (C)	01	5.8	5.8	5.6	<b>5.7</b>
3. VL 907 (C)	04	5.4	6.0	6.0	<b>5.8</b>
4. HS 507 (C)	03	5.8	6.2	6.2	<b>6.1</b>
5. HPW 349 (C)	05	5.3	5.9	5.8	<b>5.7</b>
6. HS 562	02	5.7	5.7	5.8	<b>5.7</b>
<b>Mean</b>		<b>5.6</b>	<b>6.0</b>	<b>5.9</b>	<b>5.8</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	5.3	5.4	5.9	<b>5.5</b>
2. VL 804 (C)	01	5.7	5.9	6.0	<b>5.9</b>
3. VL 907 (C)	04	5.2	5.8	6.0	<b>5.7</b>
4. HS 507 (C)	03	5.3	5.7	6.4	<b>5.8</b>
5. HPW 349 (C)	05	5.2	5.2	6.2	<b>5.5</b>
6. HS 562	02	5.4	5.8	6.2	<b>5.8</b>
<b>Mean</b>		<b>5.4</b>	<b>5.6</b>	<b>6.1</b>	<b>5.7</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	4.9	5.7	6.0	<b>5.5</b>
2. HS 277 (C)	12	5.7	5.4	5.4	<b>5.5</b>
3. VL 829 (C)	13	5.9	5.8	6.2	<b>6.0</b>
4. HPW 251 (C)	03	4.8	5.6	6.5	<b>5.6</b>
5. HS 542 (I)	09	5.3	6.4	5.8	<b>5.8</b>
6. HPW 400	02	5.1	5.9	6.6	<b>5.9</b>
7. HPW 401	04	5.0	5.5	5.8	<b>5.4</b>
8. HS 590	10	5.6	5.6	6.4	<b>5.9</b>
9. HS 591	11	5.5	6.2	6.0	<b>5.9</b>
10. HS 595	08	5.2	6.8	6.6	<b>6.2</b>
11. VL 1003	06	4.9	5.3	6.0	<b>5.4</b>
12. VL 1004	07	7.0	6.6	6.2	<b>6.6</b>
13. UP 2890	01	5.6	5.7	6.4	<b>5.9</b>
<b>Mean</b>		<b>5.4</b>	<b>5.9</b>	<b>6.1</b>	<b>5.8</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	5.6	6.4	5.7	<b>5.9</b>
2. HS 490 (C)	08	5.3	5.7	5.8	<b>5.6</b>
3. HS 577	12	5.7	6.4	5.8	<b>6.0</b>
4. HS 592	04	5.6	6.4	5.6	<b>5.9</b>
5. HS 593	10	5.6	6.4	5.8	<b>5.9</b>
6. HS 594	02	5.0	6.2	5.1	<b>5.4</b>
7. HPW 410	03	4.9	6.0	5.8	<b>5.6</b>
8. HPW 411	01	5.1	5.6	5.7	<b>5.5</b>
9. HPW 412	11	5.5	6.2	5.7	<b>5.8</b>
10. VL 3002	06	5.8	6.5	5.8	<b>6.0</b>
11. VL 3004	09	5.4	6.2	6.2	<b>5.9</b>
12. VL 3005	13	5.8	7.5	5.8	<b>6.4</b>
13. VL 3006	05	5.4	6.6	5.7	<b>5.9</b>
14. UP 2891	14	5.7	6.5	5.5	<b>5.9</b>
<b>Mean</b>		<b>5.5</b>	<b>6.3</b>	<b>5.7</b>	<b>5.8</b>

**Table 2: Grain Appearance (Max-10) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety		Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>								
1.	PBW 681	05	5.8	6.6	6.3	6.0	6.5	<b>6.2</b>
2.	WH 1138	10	6.3	6.4	6.2	6.2	6.2	<b>6.3</b>
3.	HUW 666	23	6.4	6.6	6.8	6.2	5.9	<b>6.4</b>
4.	DPW 621-50 (C)	15	5.8	6.8	6.4	6.5	6.4	<b>6.4</b>
5.	HD 2967 (C)	07	6.4	6.5	6.7	6.0	6.0	<b>6.3</b>
6.	WH 1105 (C)	20	6.2	6.8	6.4	6.3	6.0	<b>6.3</b>
7.	DBW 88 (I)	03	6.2	6.5	6.3	6.2	6.4	<b>6.3</b>
8.	HD 3086 (I)	16	6.0	7.0	6.4	6.6	6.6	<b>6.5</b>
9.	PBW 677	11	5.8	6.3	6.5	6.0	6.6	<b>6.2</b>
10.	PBW 692	14	6.2	6.0	6.6	6.2	6.0	<b>6.2</b>
11.	PBW 695	22	6.2	6.5	6.4	6.0	6.3	<b>6.3</b>
12.	PBW 697	01	5.8	6.4	5.8	6.2	6.0	<b>6.0</b>
13.	PBW 698	17	6.0	6.4	6.0	6.4	6.7	<b>6.3</b>
14.	TL 2995	02	6.4	6.6	6.4	5.8	5.8	<b>6.2</b>
15.	WH 1154	13	6.0	6.3	6.8	6.4	6.8	<b>6.5</b>
16.	WH 1156	04	5.7	6.4	6.2	6.0	5.8	<b>6.0</b>
17.	WH 1157	09	6.5	6.6	5.8	6.0	6.4	<b>6.3</b>
18.	HUW 675	19	6.2	6.8	6.6	6.2	5.8	<b>6.3</b>
19.	HD 3128	08	5.0	6.3	6.5	6.2	6.2	<b>6.0</b>
20.	HD 3132	12	5.6	6.1	6.6	5.8	6.6	<b>6.1</b>
21.	HD 3133	18	3.0	6.6	6.2	6.2	6.0	<b>5.6</b>
22.	DBW 95	06	6.2	6.7	6.6	5.8	5.6	<b>6.2</b>
23.	K 1204	21	6.6	6.8	6.6	6.4	6.4	<b>6.6</b>
<b>Mean</b>			<b>5.9</b>	<b>6.5</b>	<b>6.4</b>	<b>6.2</b>	<b>6.2</b>	<b>6.2</b>
<b>Irrigated Late Sown</b>								
1.	WH 1129	08	6.2	6.8	5.3	6.4	6.1	<b>6.2</b>
2.	PBW 590 (C)	10	6.2	6.6	5.4	6.2	6.0	<b>6.1</b>
3.	WH 1021 (C)	05	6.6	6.4	5.6	6.5	6.2	<b>6.3</b>
4.	HD 3059 (C)	06	6.7	6.2	5.8	5.8	6.3	<b>6.2</b>
5.	DBW 90 (I)	09	6.5	6.5	5.5	6.4	5.8	<b>6.1</b>
6.	WH 1124 (I)	04	6.8	6.6	5.8	6.4	5.6	<b>6.2</b>
7.	PBW 702	03	6.4	6.8	5.8	6.6	6.2	<b>6.4</b>
8.	PBW 703	02	6.5	6.5	5.7	6.3	5.8	<b>6.2</b>
9.	HD 3139	01	6.8	6.6	5.5	6.0	6.2	<b>6.2</b>
10.	DBW 128	07	6.7	5.8	5.9	6.0	5.9	<b>6.1</b>
<b>Mean</b>			<b>6.5</b>	<b>6.5</b>	<b>5.6</b>	<b>6.3</b>	<b>6.0</b>	<b>6.2</b>
<b>Rainfed, Timely Sown</b>								
1.	PBW 644 (C)	03	5.6	-	6.0	-	6.5	<b>6.0</b>
2.	WH 1080 (C)	04	5.3	-	6.2	-	6.8	<b>6.1</b>
3.	PBW 660 (I)	01	6.0	-	5.8	-	7.6	<b>6.5</b>
4.	PBW 706	05	5.8	-	6.5	-	6.4	<b>6.2</b>
5.	WH 1164	02	5.8	-	5.8	-	6.0	<b>5.9</b>
<b>Mean</b>			<b>5.7</b>	-	<b>6.1</b>	-	<b>6.7</b>	<b>6.1</b>
<b>Restricted Irrigation Timely Sown</b>								
1.	WH 1142	08	5.6	-	5.7	5.8	6.0	<b>5.8</b>
2.	PBW 644 (C)	03	5.7	-	6.0	5.8	6.4	<b>6.0</b>
3.	WH 1080 (C)	04	5.7	-	5.7	5.4	6.3	<b>5.8</b>
4.	HD 3043 (C)	06	6.0	-	5.6	5.6	6.0	<b>5.8</b>
5.	PBW 706	07	6.9	-	6.5	6.3	6.7	<b>6.6</b>
6.	MP 1277	02	5.8	-	6.0	6.0	6.2	<b>6.0</b>
7.	DBW 129	05	5.9	-	5.8	5.8	6.4	<b>6.0</b>
8.	UAS 356	01	5.6	-	5.8	5.9	6.0	<b>5.8</b>
<b>Mean</b>			<b>5.9</b>	-	<b>5.9</b>	<b>5.8</b>	<b>6.3</b>	<b>6.0</b>

**Table 3: Grain Appearance (Max-10) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	6.6	6.0	6.2	<b>6.3</b>
2.	DBW 39 (C)	08	5.8	6.5	5.9	<b>6.1</b>
3.	HD 2733 (C)	05	6.2	6.8	6.4	<b>6.5</b>
4.	NW 5054 (I)	06	5.8	6.2	6.0	<b>6.0</b>
5.	K 1006 (I)	13	6.3	6.4	6.3	<b>6.3</b>
6.	HD 3127	02	5.8	5.9	5.7	<b>5.8</b>
7.	HD 3128	04	6.8	6.5	6.2	<b>6.5</b>
8.	PBW 677	11	6.4	6.4	6.0	<b>6.3</b>
9.	PBW 693	03	6.4	6.4	6.5	<b>6.4</b>
10.	WH 1132	07	6.0	6.4	6.0	<b>6.1</b>
11.	HUW 661	10	5.6	6.6	5.9	<b>6.0</b>
12.	DBW 98	01	6.6	6.2	6.2	<b>6.3</b>
13.	UP 2855	09	6.6	6.6	6.0	<b>6.4</b>
	<b>Mean</b>		<b>6.2</b>	<b>6.4</b>	<b>6.1</b>	<b>6.2</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	6.2	5.8	6.4	<b>6.1</b>
2.	DBW 107	03	5.6	5.7	6.6	<b>6.0</b>
3.	K 1114	08	5.6	4.9	5.9	<b>5.5</b>
4.	NW 2036 (C)	13	5.7	5.9	5.9	<b>5.8</b>
5.	DBW 14 (C)	12	5.9	6.4	6.0	<b>6.1</b>
6.	HD 2985 (C)	01	5.6	5.8	6.3	<b>5.9</b>
7.	HI 1563 (C)	09	6.0	6.1	6.5	<b>6.2</b>
8.	HD 3139	05	5.6	5.4	6.2	<b>5.7</b>
9.	DBW 126	11	5.7	5.4	6.2	<b>5.8</b>
10.	PBW 701	02	6.2	6.2	6.6	<b>6.3</b>
11.	PBW 702	10	5.6	5.7	6.0	<b>5.8</b>
12.	PBW 704	07	6.0	5.7	6.0	<b>5.9</b>
13.	HUW 677	04	5.8	5.3	6.4	<b>5.8</b>
	<b>Mean</b>		<b>5.8</b>	<b>5.7</b>	<b>6.2</b>	<b>5.9</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	5.8	6.4	6.8	<b>6.3</b>
2.	C 306 (C)	03	5.7	6.6	6.5	<b>6.3</b>
3.	K 8027 (C)	05	5.8	6.7	6.4	<b>6.3</b>
4.	HD 2888 (C)	04	6.0	6.7	6.6	<b>6.4</b>
5.	HUW 679	02	5.7	6.4	6.6	<b>6.2</b>
6.	UAS 356	06	5.7	6.6	6.6	<b>6.3</b>
	<b>Mean</b>		<b>5.8</b>	<b>6.6</b>	<b>6.6</b>	<b>6.3</b>

**Table 4: Grain Appearance (Max-10) of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	7.0	6.8	6.8	6.7	7.6	<b>7.0</b>
2.	GW 322 (C)	09	7.0	6.5	6.7	6.9	6.8	<b>6.8</b>
3.	HI 1544 (C)	10	7.2	7.5	6.9	7.0	7.4	<b>7.2</b>
4.	GW 451	03	7.8	6.9	6.8	6.8	7.5	<b>7.2</b>
5.	MACS 6604	07	6.6	6.6	6.6	6.8	7.2	<b>6.8</b>
	<b>Mean</b>		<b>7.1</b>	<b>6.9</b>	<b>6.8</b>	<b>6.8</b>	<b>7.3</b>	<b>7.0</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	7.8	7.2	7.9	6.2	7.7	<b>7.4</b>
2.	HD 2864 (C)	03	7.5	6.9	7.2	6.0	7.2	<b>7.0</b>
3.	HD 2932 (C)	01	6.9	6.0	7.4	6.4	7.2	<b>6.8</b>
4.	MP 3336 (C)	04	7.4	7.1	7.8	6.4	7.5	<b>7.2</b>
5.	GW 455	02	7.2	7.6	7.8	6.7	7.4	<b>7.3</b>
	<b>Mean</b>		<b>7.4</b>	<b>7.0</b>	<b>7.6</b>	<b>6.3</b>	<b>7.4</b>	<b>7.1</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	7.8	6.5	-	-	-	<b>7.2</b>
2.	PBW 689	17	7.6	6.5	-	-	-	<b>7.1</b>
3.	WH 1142	01	6.7	6.4	-	-	-	<b>6.6</b>
4.	HI 1500 (C)	16	7.1	6.2	-	-	-	<b>6.7</b>
5.	MP 3288 (C)	15	7.0	6.8	-	-	-	<b>6.9</b>
6.	NIAW 2030	03	7.2	6.5	-	-	-	<b>6.9</b>
7.	MP 1279	11	7.4	6.4	-	-	-	<b>6.9</b>
8.	K 1215	04	6.8	6.6	-	-	-	<b>6.7</b>
9.	K 1217	02	6.5	6.2	-	-	-	<b>6.4</b>
10.	CG 1010	07	6.7	6.4	-	-	-	<b>6.6</b>
	<b>Mean</b>		<b>7.1</b>	<b>6.5</b>	-	-	-	<b>6.8</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	7.2	6.4	-	-	-	<b>6.8</b>
2.	HI 1500 (C)	01	7.5	6.7	-	-	-	<b>7.1</b>
3.	MP 3288 (C)	02	6.4	6.3	-	-	-	<b>6.4</b>
4.	HI 8627 (C) (d)	04	7.6	6.8	-	-	-	<b>7.2</b>
5.	HD 3146	05	7.4	6.2	-	-	-	<b>6.8</b>
	<b>Mean</b>		<b>7.2</b>	<b>6.5</b>	-	-	-	<b>6.9</b>



**Table 5: Grain Appearance (Max-10) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	5.7	6.9	7.2	<b>6.6</b>
2. MACS 6478 (I)	04	5.9	7.0	7.3	<b>6.7</b>
3. MACS 6604	07	5.7	6.8	7.2	<b>6.6</b>
<b>Mean</b>		<b>5.8</b>	<b>6.9</b>	<b>7.2</b>	<b>6.6</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	6.0	6.8	7.2	<b>6.7</b>
2. Raj 4083 (C)	02	6.2	6.2	7.3	<b>6.6</b>
3. HD 3090 (I)	04	6.3	6.0	7.0	<b>6.4</b>
4. HUW 677	01	6.3	6.4	7.3	<b>6.7</b>
5. UP 2864	05	6.4	6.4	6.8	<b>6.5</b>
6. K 1213	06	6.3	6.5	7.2	<b>6.7</b>
<b>Mean</b>		<b>6.3</b>	<b>6.4</b>	<b>7.1</b>	<b>6.6</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	7.2	-	<b>7.2</b>
2. NIAW 1994	05	-	7.6	-	<b>7.6</b>
3. NI 5439 (C)	02	-	7.2	-	<b>7.2</b>
4. NIAW 1415 (C)	06	-	7.4	-	<b>7.4</b>
5. NIAW 2030	01	-	8.4	-	<b>8.4</b>
<b>Mean</b>		-	<b>7.6</b>	-	<b>7.6</b>

**Table 6: Grain Appearance (Max-10) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	6.8	6.2	7.8	6.2	<b>6.8</b>
2. HW 2044 (C)	05	6.4	6.7	8.6	6.5	<b>7.1</b>
3. HW 5216 (C)	02	6.5	6.8	8.0	6.6	<b>7.0</b>
4. UAS 358	03	6.0	6.5	8.4	6.4	<b>6.8</b>
5. MACS 6507	04	6.2	6.6	8.2	6.2	<b>6.8</b>
<b>Mean</b>		<b>6.4</b>	<b>6.6</b>	<b>8.2</b>	<b>6.4</b>	<b>6.9</b>

**Table 7: Test Weight (kg/hl) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	78.5	79.5	80.5	<b>79.5</b>
2. VL 804 (C)	01	81.5	80.5	80.0	<b>80.7</b>
3. VL 907 (C)	04	78.7	79.5	77.5	<b>78.6</b>
4. HS 507 (C)	03	79.5	80.7	81.2	<b>80.5</b>
5. HPW 349 (C)	05	80.5	81.0	80.0	<b>80.5</b>
6. HS 562	02	80.5	78.5	77.5	<b>78.8</b>
<b>Mean</b>		<b>79.9</b>	<b>80.0</b>	<b>79.5</b>	<b>79.8</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	69.5	80.0	78.5	<b>76.0</b>
2. VL 804 (C)	01	77.5	82.4	81.6	<b>80.5</b>
3. VL 907 (C)	04	75.6	81.0	77.5	<b>78.0</b>
4. HS 507 (C)	03	74.5	81.0	81.0	<b>78.8</b>
5. HPW 349 (C)	05	80.0	80.6	81.5	<b>80.7</b>
6. HS 562	02	72.6	80.0	80.0	<b>77.5</b>
<b>Mean</b>		<b>75.0</b>	<b>80.8</b>	<b>80.0</b>	<b>78.6</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	72.5	80.0	81.3	<b>77.9</b>
2. HS 277 (C)	12	76.0	78.3	79.0	<b>77.8</b>
3. VL 829 (C)	13	76.3	82.0	84.0	<b>80.8</b>
4. HPW 251 (C)	03	73.5	80.5	83.0	<b>79.0</b>
5. HS 542 (I)	09	75.0	81.0	83.0	<b>79.7</b>
6. HPW 400	02	71.5	79.0	80.7	<b>77.1</b>
7. HPW 401	04	71.0	75.0	79.3	<b>75.1</b>
8. HS 590	10	76.0	81.0	82.6	<b>79.9</b>
9. HS 591	11	73.6	78.6	81.0	<b>77.7</b>
10. HS 595	08	74.0	81.5	82.0	<b>79.2</b>
11. VL 1003	06	72.6	79.5	81.0	<b>77.7</b>
12. VL 1004	07	79.0	82.5	83.0	<b>81.5</b>
13. UP 2890	01	73.0	78.5	80.6	<b>77.4</b>
<b>Mean</b>		<b>74.2</b>	<b>79.8</b>	<b>81.6</b>	<b>78.5</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	78.0	80.0	80.5	<b>79.5</b>
2. HS 490 (C)	08	73.4	76.0	75.6	<b>75.0</b>
3. HS 577	12	73.5	77.0	80.5	<b>77.0</b>
4. HS 592	04	79.0	81.0	81.6	<b>80.5</b>
5. HS 593	10	74.0	78.5	80.7	<b>77.7</b>
6. HS 594	02	76.0	78.0	79.5	<b>77.8</b>
7. HPW 410	03	74.3	78.0	77.5	<b>76.6</b>
8. HPW 411	01	75.0	78.0	78.0	<b>77.0</b>
9. HPW 412	11	77.0	81.3	81.3	<b>79.9</b>
10. VL 3002	06	78.5	80.3	80.5	<b>79.8</b>
11. VL 3004	09	75.6	77.5	79.0	<b>77.4</b>
12. VL 3005	13	77.5	79.2	79.0	<b>78.6</b>
13. VL 3006	05	78.4	80.0	80.5	<b>79.6</b>
14. UP 2891	14	76.5	77.0	75.3	<b>76.3</b>
<b>Mean</b>		<b>76.2</b>	<b>78.7</b>	<b>79.3</b>	<b>78.0</b>

**Table 8: Test Weight (kg/hl) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

	Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>								
1.	PBW 681	05	78.7	79.0	80.2	76.4	80.3	<b>78.9</b>
2.	WH 1138	10	78.2	80.3	79.0	76.7	79.0	<b>78.6</b>
3.	HUW 666	23	77.3	80.3	81.3	76.0	78.3	<b>78.6</b>
4.	DPW 621-50 (C)	15	77.3	80.0	79.5	76.0	77.5	<b>78.1</b>
5.	HD 2967 (C)	07	76.6	77.5	79.0	75.7	78.6	<b>77.5</b>
6.	WH 1105 (C)	20	79.8	79.5	80.5	76.0	80.1	<b>79.2</b>
7.	DBW 88 (I)	03	78.2	80.0	79.5	76.3	79.5	<b>78.7</b>
8.	HD 3086 (I)	16	78.8	81.0	79.0	77.0	79.3	<b>79.0</b>
9.	PBW 677	11	79.5	79.3	81.3	78.2	79.2	<b>79.5</b>
10.	PBW 692	14	77.8	78.0	81.0	76.0	78.6	<b>78.3</b>
11.	PBW 695	22	76.3	78.0	80.3	76.0	78.2	<b>77.8</b>
12.	PBW 697	01	78.6	80.0	79.0	76.2	78.6	<b>78.5</b>
13.	PBW 698	17	78.2	80.0	80.0	75.0	79.0	<b>78.4</b>
14.	TL 2995	02	73.8	75.0	74.3	69.5	74.6	<b>73.4</b>
15.	WH 1154	13	78.6	80.3	80.5	78.4	80.5	<b>79.7</b>
16.	WH 1156	04	76.7	75.0	77.0	75.0	76.0	<b>75.9</b>
17.	WH 1157	09	80.7	80.4	80.4	77.0	80.0	<b>79.7</b>
18.	HUW 675	19	77.5	80.0	80.0	77.0	78.2	<b>78.5</b>
19.	HD 3128	08	74.7	75.7	79.5	76.5	78.0	<b>76.9</b>
20.	HD 3132	12	77.5	79.0	80.5	75.5	77.4	<b>78.0</b>
21.	HD 3133	18	53.2	80.4	79.0	76.0	77.3	<b>73.2</b>
22.	DBW 95	06	79.6	80.0	81.5	78.0	77.3	<b>79.3</b>
23.	K 1204	21	80.8	81.4	82.5	78.2	81.3	<b>80.8</b>
	<b>Mean</b>		<b>76.9</b>	<b>79.1</b>	<b>79.8</b>	<b>76.2</b>	<b>78.6</b>	<b>78.1</b>
<b>Irrigated Late Sown</b>								
1.	WH 1129	08	79.0	75.0	73.0	77.0	77.0	<b>76.2</b>
2.	PBW 590 (C)	10	81.0	78.2	77.7	78.0	79.5	<b>78.9</b>
3.	WH 1021 (C)	05	82.0	77.0	77.8	79.5	80.4	<b>79.3</b>
4.	HD 3059 (C)	06	80.0	76.0	80.1	78.0	77.5	<b>78.3</b>
5.	DBW 90 (I)	09	80.0	77.5	77.2	77.5	78.0	<b>78.0</b>
6.	WH 1124 (I)	04	80.3	78.0	78.3	76.5	78.2	<b>78.3</b>
7.	PBW 702	03	80.5	79.0	80.2	77.0	78.4	<b>79.0</b>
8.	PBW 703	02	79.6	78.0	80.1	77.0	79.0	<b>78.7</b>
9.	HD 3139	01	81.0	79.0	77.3	78.0	79.0	<b>78.9</b>
10.	DBW 128	07	81.0	74.0	77.5	78.0	79.0	<b>77.9</b>
	<b>Mean</b>		<b>80.4</b>	<b>77.2</b>	<b>77.9</b>	<b>77.7</b>	<b>78.6</b>	<b>78.4</b>
<b>Rainfed, Timely Sown</b>								
1.	PBW 644 (C)	03	76.0	-	80.5	-	80.6	<b>79.0</b>
2.	WH 1080 (C)	04	71.0	-	81.0	-	79.2	<b>77.1</b>
3.	PBW 660 (I)	01	77.5	-	81.3	-	82.6	<b>80.5</b>
4.	PBW 706	05	75.2	-	80.0	-	79.8	<b>78.3</b>
5.	WH 1164	02	73.7	-	80.5	-	79.2	<b>77.8</b>
	<b>Mean</b>		<b>74.7</b>	<b>-</b>	<b>80.7</b>	<b>-</b>	<b>80.3</b>	<b>78.5</b>
<b>Restricted Irrigation Timely Sown</b>								
1.	WH 1142	08	73.6	-	79.0	79.5	81.6	<b>78.4</b>
2.	PBW 644 (C)	03	76.6	-	78.7	80.0	81.2	<b>79.1</b>
3.	WH 1080 (C)	04	72.0	-	78.2	77.0	79.5	<b>76.7</b>
4.	HD 3043 (C)	06	78.0	-	80.6	81.0	82.6	<b>80.6</b>
5.	PBW 706	07	77.0	-	78.0	79.0	79.5	<b>78.4</b>
6.	MP 1277	02	75.0	-	78.5	81.0	81.3	<b>79.0</b>
7.	DBW 129	05	77.5	-	79.5	80.0	81.5	<b>79.6</b>
8.	UAS 356	01	75.0	-	77.5	80.0	80.0	<b>78.1</b>
	<b>Mean</b>		<b>75.6</b>	<b>-</b>	<b>78.8</b>	<b>79.7</b>	<b>80.9</b>	<b>78.7</b>

**Table 9: Test Weight (kg/hl) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	83.0	80.0	80.0	<b>81.0</b>
2.	DBW 39 (C)	08	80.4	80.6	78.6	<b>79.9</b>
3.	HD 2733 (C)	05	81.0	81.6	78.4	<b>80.3</b>
4.	NW 5054 (I)	06	78.7	78.0	77.0	<b>77.9</b>
5.	K 1006 (I)	13	82.0	80.6	80.0	<b>80.9</b>
6.	HD 3127	02	80.5	80.2	79.2	<b>80.0</b>
7.	HD 3128	04	79.2	80.0	78.4	<b>79.2</b>
8.	PBW 677	11	82.0	82.0	80.0	<b>81.3</b>
9.	PBW 693	03	80.6	80.3	79.3	<b>80.1</b>
10.	WH 1132	07	81.0	80.2	78.6	<b>79.9</b>
11.	HUW 661	10	80.0	80.5	78.0	<b>79.5</b>
12.	DBW 98	01	81.0	81.0	78.5	<b>80.2</b>
13.	UP 2855	09	82.2	80.0	79.5	<b>80.6</b>
	<b>Mean</b>		<b>80.9</b>	<b>80.4</b>	<b>78.9</b>	<b>80.1</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	81.0	80.0	81.4	<b>80.8</b>
2.	DBW 107	03	78.0	79.0	79.0	<b>78.7</b>
3.	K 1114	08	78.6	72.0	77.0	<b>75.9</b>
4.	NW 2036 (C)	13	80.0	78.0	80.4	<b>79.5</b>
5.	DBW 14 (C)	12	76.3	79.0	78.0	<b>77.8</b>
6.	HD 2985 (C)	01	77.2	74.5	77.5	<b>76.4</b>
7.	HI 1563 (C)	09	81.4	79.0	81.4	<b>80.6</b>
8.	HD 3139	05	78.6	75.0	79.5	<b>77.7</b>
9.	DBW 126	11	78.0	76.0	79.5	<b>77.8</b>
10.	PBW 701	02	78.0	79.0	81.0	<b>79.3</b>
11.	PBW 702	10	78.0	77.5	79.5	<b>78.3</b>
12.	PBW 704	07	78.0	77.0	78.0	<b>77.7</b>
13.	HUW 677	04	77.5	71.0	78.0	<b>75.5</b>
	<b>Mean</b>		<b>78.5</b>	<b>76.7</b>	<b>79.2</b>	<b>78.1</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	83.0	80.6	81.0	<b>81.5</b>
2.	C 306 (C)	03	83.0	81.6	80.2	<b>81.6</b>
3.	K 8027 (C)	05	82.0	79.4	80.0	<b>80.5</b>
4.	HD 2888 (C)	04	81.0	80.0	79.5	<b>80.2</b>
5.	HUW 679	02	83.0	79.5	79.2	<b>80.6</b>
6.	UAS 356	06	79.5	79.5	78.5	<b>79.2</b>
	<b>Mean</b>		<b>81.9</b>	<b>80.1</b>	<b>79.7</b>	<b>80.6</b>

**Table 10: Test Weight (kg/ha) of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	84.5	83.2	82.0	83.5	82.2	<b>83.1</b>
2.	GW 322 (C)	09	82.0	81.0	81.0	81.0	79.8	<b>81.0</b>
3.	HI 1544 (C)	10	83.0	82.5	81.0	82.5	83.7	<b>82.5</b>
4.	GW 451	03	84.3	83.4	82.0	84.0	84.2	<b>83.6</b>
5.	MACS 6604	07	81.6	83.2	81.0	82.6	82.5	<b>82.2</b>
	<b>Mean</b>		<b>83.1</b>	<b>82.7</b>	<b>81.4</b>	<b>82.7</b>	<b>82.5</b>	<b>82.5</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	82.3	82.7	82.5	82.6	84.0	<b>82.8</b>
2.	HD 2864 (C)	03	82.5	82.4	83.0	82.4	84.6	<b>83.0</b>
3.	HD 2932 (C)	01	84.3	77.3	82.2	79.0	82.0	<b>81.0</b>
4.	MP 3336 (C)	04	80.0	82.2	83.0	83.0	83.0	<b>82.2</b>
5.	GW 455	02	82.5	82.3	82.5	83.0	85.0	<b>83.1</b>
	<b>Mean</b>		<b>82.3</b>	<b>81.4</b>	<b>82.6</b>	<b>82.0</b>	<b>83.7</b>	<b>82.4</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	83.6	81.5	-	-	-	<b>82.6</b>
2.	PBW 689	17	82.2	82.5	-	-	-	<b>82.4</b>
3.	WH 1142	01	81.7	82.0	-	-	-	<b>81.9</b>
4.	HI 1500 (C)	16	84.3	82.0	-	-	-	<b>83.2</b>
5.	MP 3288 (C)	15	83.0	83.4	-	-	-	<b>83.2</b>
6.	NIAW 2030	03	83.6	80.6	-	-	-	<b>82.1</b>
7.	MP 1279	11	84.0	81.4	-	-	-	<b>82.7</b>
8.	K 1215	04	84.0	82.0	-	-	-	<b>83.0</b>
9.	K 1217	02	83.0	81.3	-	-	-	<b>82.2</b>
10.	CG 1010	07	81.0	80.6	-	-	-	<b>80.8</b>
	<b>Mean</b>		<b>83.0</b>	<b>81.7</b>	-	-	-	<b>82.4</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	83.5	81.0	-	-	-	<b>82.3</b>
2.	HI 1500 (C)	01	84.5	82.6	-	-	-	<b>83.6</b>
3.	MP 3288 (C)	02	83.0	82.0	-	-	-	<b>82.5</b>
4.	HI 8627 (C) (d)	04	85.2	82.0	-	-	-	<b>83.6</b>
5.	HD 3146	05	83.2	82.0	-	-	-	<b>82.6</b>
	<b>Mean</b>		<b>83.9</b>	<b>81.9</b>	-	-	-	<b>82.9</b>

**Table 11: Test Weight (kg/hl) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	81.0	81.3	84.6	<b>82.3</b>
2. MACS 6478 (I)	04	79.0	80.5	83.2	<b>80.9</b>
3. MACS 6604	07	78.3	79.5	83.3	<b>80.4</b>
<b>Mean</b>		<b>79.4</b>	<b>80.4</b>	<b>83.7</b>	<b>81.2</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	81.2	80.0	83.0	<b>81.4</b>
2. Raj 4083 (C)	02	81.4	78.5	84.2	<b>81.4</b>
3. HD 3090 (I)	04	81.4	79.4	83.0	<b>81.3</b>
4. HUW 677	01	79.6	79.6	83.1	<b>80.8</b>
5. UP 2864	05	81.0	79.5	82.6	<b>81.0</b>
6. K 1213	06	81.0	79.5	84.2	<b>81.6</b>
<b>Mean</b>		<b>80.9</b>	<b>79.4</b>	<b>83.4</b>	<b>81.2</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	80.0	-	<b>80.0</b>
2. NIAW 1994	05	-	82.6	-	<b>82.6</b>
3. NI 5439 (C)	02	-	81.0	-	<b>81.0</b>
4. NIAW 1415 (C)	06	-	80.3	-	<b>80.3</b>
5. NIAW 2030	01	-	80.5	-	<b>80.5</b>
<b>Mean</b>		-	<b>80.9</b>	-	<b>80.9</b>

**Table 12: Test Weight (kg/hl) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	80.0	78.2	81.3	80.6	<b>80.0</b>
2. HW 2044 (C)	05	76.5	78.2	82.3	81.5	<b>79.6</b>
3. HW 5216 (C)	02	83.0	81.0	79.5	80.0	<b>80.9</b>
4. UAS 358	03	81.0	81.4	82.0	81.2	<b>81.4</b>
5. MACS 6507	04	75.0	80.0	81.0	78.6	<b>78.7</b>
<b>Mean</b>		<b>79.1</b>	<b>79.8</b>	<b>81.2</b>	<b>80.4</b>	<b>80.1</b>

**Table 13: Protein Content (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	8.80	8.36	10.13	<b>9.10</b>
2. VL 804 (C)	01	9.14	8.79	11.81	<b>9.91</b>
3. VL 907 (C)	04	9.98	8.25	11.80	<b>10.01</b>
4. HS 507 (C)	03	8.55	8.95	11.09	<b>9.53</b>
5. HPW 349 (C)	05	8.28	8.52	10.92	<b>9.24</b>
6. HS 562	02	8.76	7.85	11.84	<b>9.48</b>
<b>Mean</b>		<b>8.92</b>	<b>8.45</b>	<b>11.27</b>	<b>9.55</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	10.77	8.04	8.90	<b>9.24</b>
2. VL 804 (C)	01	10.56	8.07	9.20	<b>9.28</b>
3. VL 907 (C)	04	11.12	8.15	8.54	<b>9.27</b>
4. HS 507 (C)	03	12.39	8.25	8.52	<b>9.72</b>
5. HPW 349 (C)	05	10.38	8.19	8.78	<b>9.12</b>
6. HS 562	02	11.87	8.01	8.80	<b>9.56</b>
<b>Mean</b>		<b>11.18</b>	<b>8.12</b>	<b>8.79</b>	<b>9.36</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	11.52	8.79	8.44	<b>9.58</b>
2. HS 277 (C)	12	11.26	8.15	8.23	<b>9.21</b>
3. VL 829 (C)	13	10.89	8.31	8.70	<b>9.30</b>
4. HPW 251 (C)	03	13.39	8.40	8.47	<b>10.09</b>
5. HS 542 (I)	09	11.42	8.29	8.47	<b>9.39</b>
6. HPW 400	02	11.84	9.97	8.39	<b>10.07</b>
7. HPW 401	04	12.28	11.15	11.77	<b>11.73</b>
8. HS 590	10	11.63	10.94	9.78	<b>10.78</b>
9. HS 591	11	12.45	10.07	9.46	<b>10.66</b>
10. HS 595	08	12.39	9.40	9.35	<b>10.38</b>
11. VL 1003	06	11.68	8.31	8.81	<b>9.60</b>
12. VL 1004	07	10.87	9.02	8.92	<b>9.60</b>
13. UP 2890	01	10.91	8.29	8.83	<b>9.34</b>
<b>Mean</b>		<b>11.73</b>	<b>9.16</b>	<b>9.05</b>	<b>9.98</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	9.56	9.79	8.23	<b>9.19</b>
2. HS 490 (C)	08	9.94	9.63	8.77	<b>9.45</b>
3. HS 577	12	10.23	10.29	8.49	<b>9.67</b>
4. HS 592	04	9.71	10.63	8.36	<b>9.57</b>
5. HS 593	10	10.21	10.13	8.96	<b>9.77</b>
6. HS 594	02	10.65	10.55	8.70	<b>9.97</b>
7. HPW 410	03	11.77	10.27	9.10	<b>10.38</b>
8. HPW 411	01	8.27	9.81	9.06	<b>9.05</b>
9. HPW 412	11	11.60	10.26	9.20	<b>10.35</b>
10. VL 3002	06	10.25	11.60	8.75	<b>10.20</b>
11. VL 3004	09	10.51	10.84	9.95	<b>10.43</b>
12. VL 3005	13	10.24	12.52	8.88	<b>10.55</b>
13. VL 3006	05	8.63	11.23	8.93	<b>9.60</b>
14. UP 2891	14	9.84	10.65	9.07	<b>9.85</b>
<b>Mean</b>		<b>10.10</b>	<b>10.59</b>	<b>8.89</b>	<b>9.86</b>

**Table 14: Protein Content (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

	Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>								
1.	PBW 681	05	11.23	11.94	12.71	11.97	10.98	<b>11.77</b>
2.	WH 1138	10	11.68	11.30	11.57	11.18	11.06	<b>11.36</b>
3.	HUW 666	23	11.27	11.81	12.90	12.80	10.80	<b>11.92</b>
4.	DPW 621-50 (C)	15	10.47	13.12	12.92	12.34	11.02	<b>11.97</b>
5.	HD 2967 (C)	07	11.15	12.11	12.04	11.85	10.10	<b>11.45</b>
6.	WH 1105 (C)	20	9.85	12.33	12.05	11.95	10.90	<b>11.42</b>
7.	DBW 88 (I)	03	11.21	11.87	13.29	11.53	11.03	<b>11.79</b>
8.	HD 3086 (I)	16	10.44	11.64	12.20	12.03	10.71	<b>11.40</b>
9.	PBW 677	11	11.56	12.74	12.42	11.45	10.47	<b>11.73</b>
10.	PBW 692	14	12.62	12.52	12.08	11.68	11.44	<b>12.07</b>
11.	PBW 695	22	11.68	12.05	12.25	10.90	11.20	<b>11.62</b>
12.	PBW 697	01	10.69	11.27	11.57	12.48	11.70	<b>11.54</b>
13.	PBW 698	17	9.90	11.58	12.36	11.84	11.07	<b>11.35</b>
14.	TL 2995	02	11.65	13.37	12.50	12.67	11.73	<b>12.38</b>
15.	WH 1154	13	11.09	11.59	11.38	11.88	10.28	<b>11.24</b>
16.	WH 1156	04	9.61	11.34	11.93	10.50	9.32	<b>10.54</b>
17.	WH 1157	09	10.55	11.64	11.80	11.69	11.21	<b>11.38</b>
18.	HUW 675	19	11.77	12.34	12.39	10.33	11.75	<b>11.72</b>
19.	HD 3128	08	10.65	12.49	11.98	11.71	11.53	<b>11.67</b>
20.	HD 3132	12	11.32	12.79	12.43	12.41	11.68	<b>12.13</b>
21.	HD 3133	18	12.14	11.93	11.67	10.93	10.77	<b>11.49</b>
22.	DBW 95	06	10.53	12.29	11.53	11.01	11.02	<b>11.28</b>
23.	K 1204	21	10.99	12.99	12.17	12.42	11.40	<b>11.99</b>
	<b>Mean</b>		<b>11.05</b>	<b>12.13</b>	<b>12.18</b>	<b>11.72</b>	<b>11.01</b>	<b>11.62</b>
<b>Irrigated Late Sown</b>								
1.	WH 1129	08	10.92	12.88	14.32	11.61	11.47	<b>12.24</b>
2.	PBW 590 (C)	10	11.55	13.19	12.30	11.36	11.15	<b>11.91</b>
3.	WH 1021 (C)	05	10.60	13.54	13.49	11.32	10.69	<b>11.93</b>
4.	HD 3059 (C)	06	11.12	13.45	12.77	11.32	11.76	<b>12.08</b>
5.	DBW 90 (I)	09	11.16	13.08	12.20	11.33	10.90	<b>11.73</b>
6.	WH 1124 (I)	04	10.98	12.75	12.60	10.88	11.11	<b>11.66</b>
7.	PBW 702	03	11.61	13.89	12.33	11.24	11.13	<b>12.04</b>
8.	PBW 703	02	11.10	13.25	12.68	12.31	11.69	<b>12.21</b>
9.	HD 3139	01	10.67	13.18	13.29	11.46	10.89	<b>11.90</b>
10.	DBW 128	07	11.39	14.89	13.25	11.25	11.02	<b>12.36</b>
	<b>Mean</b>		<b>11.11</b>	<b>13.41</b>	<b>12.92</b>	<b>11.41</b>	<b>11.18</b>	<b>12.01</b>
<b>Rainfed, Timely Sown</b>								
1.	PBW 644 (C)	03	11.69	-	14.23	-	9.38	<b>11.77</b>
2.	WH 1080 (C)	04	12.11	-	13.27	-	9.79	<b>11.72</b>
3.	PBW 660 (I)	01	13.03	-	13.65	-	9.84	<b>12.17</b>
4.	PBW 706	05	12.39	-	12.15	-	10.05	<b>11.53</b>
5.	WH 1164	02	11.76	-	13.59	-	9.87	<b>11.74</b>
	<b>Mean</b>		<b>12.20</b>	<b>-</b>	<b>13.38</b>	<b>-</b>	<b>9.79</b>	<b>11.79</b>
<b>Restricted Irrigation Timely Sown</b>								
1.	WH 1142	08	11.84	-	13.62	8.92	9.94	<b>11.08</b>
2.	PBW 644 (C)	03	12.12	-	13.60	9.39	9.42	<b>11.13</b>
3.	WH 1080 (C)	04	11.36	-	12.86	9.93	10.44	<b>11.15</b>
4.	HD 3043 (C)	06	12.10	-	13.52	9.53	10.67	<b>11.46</b>
5.	PBW 706	07	11.84	-	13.16	9.19	10.27	<b>11.12</b>
6.	MP 1277	02	11.95	-	12.46	9.14	8.96	<b>10.63</b>
7.	DBW 129	05	12.46	-	13.84	9.96	11.21	<b>11.87</b>
8.	UAS 356	01	11.26	-	12.84	9.84	9.82	<b>10.94</b>
	<b>Mean</b>		<b>11.87</b>	<b>-</b>	<b>13.24</b>	<b>9.49</b>	<b>10.09</b>	<b>11.17</b>



**Table 15: Protein Content (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	9.58	12.43	11.11	<b>11.04</b>
2.	DBW 39 (C)	08	9.31	12.04	11.00	<b>10.78</b>
3.	HD 2733 (C)	05	9.62	11.77	10.99	<b>10.79</b>
4.	NW 5054 (I)	06	10.05	12.33	10.89	<b>11.09</b>
5.	K 1006 (I)	13	9.72	11.76	11.05	<b>10.84</b>
6.	HD 3127	02	9.46	12.30	10.88	<b>10.88</b>
7.	HD 3128	04	10.47	13.26	11.43	<b>11.72</b>
8.	PBW 677	11	10.40	13.10	11.14	<b>11.55</b>
9.	PBW 693	03	10.66	12.99	11.51	<b>11.72</b>
10.	WH 1132	07	9.52	12.32	11.58	<b>11.14</b>
11.	HUW 661	10	9.40	11.20	10.56	<b>10.39</b>
12.	DBW 98	01	9.01	12.07	11.57	<b>10.88</b>
13.	UP 2855	09	10.12	12.46	11.54	<b>11.37</b>
	<b>Mean</b>		<b>9.79</b>	<b>12.31</b>	<b>11.17</b>	<b>11.09</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	11.15	12.86	10.86	<b>11.62</b>
2.	DBW 107	03	11.92	13.29	11.94	<b>12.38</b>
3.	K 1114	08	10.17	11.77	9.76	<b>10.57</b>
4.	NW 2036 (C)	13	11.45	12.23	10.55	<b>11.41</b>
5.	DBW 14 (C)	12	11.55	12.73	11.47	<b>11.92</b>
6.	HD 2985 (C)	01	11.02	11.68	10.98	<b>11.23</b>
7.	HI 1563 (C)	09	11.00	11.98	10.93	<b>11.30</b>
8.	HD 3139	05	11.10	13.32	10.45	<b>11.62</b>
9.	DBW 126	11	11.67	13.18	10.98	<b>11.94</b>
10.	PBW 701	02	10.71	13.30	11.01	<b>11.67</b>
11.	PBW 702	10	11.14	12.30	11.00	<b>11.48</b>
12.	PBW 704	07	11.73	13.01	11.96	<b>12.23</b>
13.	HUW 677	04	10.46	12.53	9.88	<b>10.96</b>
	<b>Mean</b>		<b>11.16</b>	<b>12.63</b>	<b>10.91</b>	<b>11.56</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	9.14	11.75	10.22	<b>10.37</b>
2.	C 306 (C)	03	9.03	12.98	8.72	<b>10.24</b>
3.	K 8027 (C)	05	8.98	14.05	9.41	<b>10.81</b>
4.	HD 2888 (C)	04	10.26	13.73	9.15	<b>11.05</b>
5.	HUW 679	02	10.48	13.10	10.31	<b>11.30</b>
6.	UAS 356	06	9.43	12.07	9.11	<b>10.20</b>
	<b>Mean</b>		<b>9.55</b>	<b>12.95</b>	<b>9.49</b>	<b>10.66</b>

**Table 16: Protein Content (%) of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	11.28	13.28	14.25	11.23	12.83	<b>12.57</b>
2.	GW 322 (C)	09	8.72	11.86	11.05	10.42	10.20	<b>10.45</b>
3.	HI 1544 (C)	10	9.94	12.32	12.20	11.07	11.10	<b>11.33</b>
4.	GW 451	03	10.17	11.78	11.79	10.38	10.70	<b>10.96</b>
5.	MACS 6604	07	10.14	11.83	11.83	11.05	11.45	<b>11.26</b>
	<b>Mean</b>		<b>10.05</b>	<b>12.21</b>	<b>12.22</b>	<b>10.83</b>	<b>11.26</b>	<b>11.31</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	10.91	13.24	13.18	12.04	12.68	<b>12.41</b>
2.	HD 2864 (C)	03	11.13	12.07	12.49	11.16	12.15	<b>11.80</b>
3.	HD 2932 (C)	01	10.89	12.49	13.42	11.29	12.16	<b>12.05</b>
4.	MP 3336 (C)	04	11.19	13.08	12.81	12.67	11.52	<b>12.25</b>
5.	GW 455	02	10.90	11.74	12.82	11.78	11.53	<b>11.75</b>
	<b>Mean</b>		<b>11.00</b>	<b>12.52</b>	<b>12.94</b>	<b>11.79</b>	<b>12.01</b>	<b>12.05</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	13.84	9.13	-	-	-	<b>11.49</b>
2.	PBW 689	17	13.33	9.72	-	-	-	<b>11.53</b>
3.	WH 1142	01	11.81	8.77	-	-	-	<b>10.29</b>
4.	HI 1500 (C)	16	13.29	9.29	-	-	-	<b>11.29</b>
5.	MP 3288 (C)	15	12.56	9.85	-	-	-	<b>11.21</b>
6.	NIAW 2030	03	12.33	9.52	-	-	-	<b>10.93</b>
7.	MP 1279	11	13.27	9.54	-	-	-	<b>11.41</b>
8.	K 1215	04	12.16	8.91	-	-	-	<b>10.54</b>
9.	K 1217	02	13.56	9.14	-	-	-	<b>11.35</b>
10.	CG 1010	07	14.29	11.61	-	-	-	<b>12.95</b>
	<b>Mean</b>		<b>13.04</b>	<b>9.55</b>	-	-	-	<b>11.30</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	11.84	13.09	-	-	-	<b>12.47</b>
2.	HI 1500 (C)	01	11.52	11.99	-	-	-	<b>11.76</b>
3.	MP 3288 (C)	02	10.51	13.10	-	-	-	<b>11.81</b>
4.	HI 8627 (C) (d)	04	9.94	9.30	-	-	-	<b>9.62</b>
5.	HD 3146	05	9.99	12.54	-	-	-	<b>11.27</b>
	<b>Mean</b>		<b>10.76</b>	<b>12.00</b>	-	-	-	<b>11.38</b>

**Table 17: Protein Content (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	12.39	14.67	12.29	<b>13.12</b>
2. MACS 6478 (I)	04	12.49	14.17	12.65	<b>13.10</b>
3. MACS 6604	07	12.06	13.79	11.66	<b>12.50</b>
<b>Mean</b>		<b>12.31</b>	<b>14.21</b>	<b>12.20</b>	<b>12.91</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	13.10	12.93	13.34	<b>13.12</b>
2. Raj 4083 (C)	02	12.54	12.50	13.03	<b>12.69</b>
3. HD 3090 (I)	04	12.14	12.00	13.32	<b>12.49</b>
4. HUW 677	01	11.08	10.54	11.76	<b>11.13</b>
5. UP 2864	05	12.50	10.38	13.20	<b>12.03</b>
6. K 1213	06	11.68	10.15	12.44	<b>11.42</b>
<b>Mean</b>		<b>12.17</b>	<b>11.42</b>	<b>12.85</b>	<b>12.15</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	12.00	-	<b>12.00</b>
2. NIAW 1994	05	-	12.44	-	<b>12.44</b>
3. NI 5439 (C)	02	-	12.78	-	<b>12.78</b>
4. NIAW 1415 (C)	06	-	13.21	-	<b>13.21</b>
5. NIAW 2030	01	-	14.40	-	<b>14.40</b>
<b>Mean</b>		-	<b>12.97</b>	-	<b>12.97</b>

**Table 18: Protein Content (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	11.94	11.26	14.31	11.41	<b>12.23</b>
2. HW 2044 (C)	05	11.74	12.70	11.99	12.81	<b>12.31</b>
3. HW 5216 (C)	02	11.67	12.72	14.70	12.61	<b>12.93</b>
4. UAS 358	03	11.61	12.21	12.54	11.50	<b>11.97</b>
5. MACS 6507	04	12.80	13.52	14.24	14.33	<b>13.72</b>
<b>Mean</b>		<b>11.95</b>	<b>12.48</b>	<b>13.56</b>	<b>12.53</b>	<b>12.63</b>

**Table 19: Grain Hardness Index of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	50	81	76	<b>69</b>
2. VL 804 (C)	01	81	63	73	<b>72</b>
3. VL 907 (C)	04	47	62	53	<b>54</b>
4. HS 507 (C)	03	61	77	72	<b>70</b>
5. HPW 349 (C)	05	49	63	52	<b>55</b>
6. HS 562	02	70	65	68	<b>68</b>
<b>Mean</b>		<b>60</b>	<b>69</b>	<b>66</b>	<b>65</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	73	44	43	<b>53</b>
2. VL 804 (C)	01	85	70	78	<b>78</b>
3. VL 907 (C)	04	70	46	49	<b>55</b>
4. HS 507 (C)	03	88	70	52	<b>70</b>
5. HPW 349 (C)	05	84	46	46	<b>59</b>
6. HS 562	02	84	59	61	<b>68</b>
<b>Mean</b>		<b>81</b>	<b>56</b>	<b>55</b>	<b>64</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	82	50	66	<b>66</b>
2. HS 277 (C)	12	73	48	53	<b>58</b>
3. VL 829 (C)	13	89	53	71	<b>71</b>
4. HPW 251 (C)	03	87	46	62	<b>65</b>
5. HS 542 (I)	09	84	50	55	<b>63</b>
6. HPW 400	02	81	48	55	<b>61</b>
7. HPW 401	04	84	67	73	<b>75</b>
8. HS 590	10	71	57	70	<b>66</b>
9. HS 591	11	80	53	70	<b>68</b>
10. HS 595	08	87	62	69	<b>73</b>
11. VL 1003	06	72	47	50	<b>56</b>
12. VL 1004	07	84	62	66	<b>71</b>
13. UP 2890	01	78	49	48	<b>58</b>
<b>Mean</b>		<b>81</b>	<b>53</b>	<b>62</b>	<b>65</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	58	79	53	<b>63</b>
2. HS 490 (C)	08	30	16	14	<b>20</b>
3. HS 577	12	58	74	46	<b>59</b>
4. HS 592	04	56	75	61	<b>64</b>
5. HS 593	10	63	61	44	<b>56</b>
6. HS 594	02	47	65	53	<b>55</b>
7. HPW 410	03	62	79	43	<b>61</b>
8. HPW 411	01	46	67	56	<b>56</b>
9. HPW 412	11	63	74	56	<b>64</b>
10. VL 3002	06	36	45	34	<b>38</b>
11. VL 3004	09	56	89	72	<b>72</b>
12. VL 3005	13	62	79	35	<b>59</b>
13. VL 3006	05	83	89	58	<b>77</b>
14. UP 2891	14	82	85	46	<b>71</b>
<b>Mean</b>		<b>57</b>	<b>70</b>	<b>48</b>	<b>58</b>

**Table 20: Grain Hardness Index of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	72	58	57	76	73	<b>67</b>
2. WH 1138	10	79	65	72	60	51	<b>65</b>
3. HUW 666	23	80	51	65	53	51	<b>60</b>
4. DPW 621-50 (C)	15	62	52	67	55	50	<b>57</b>
5. HD 2967 (C)	07	64	49	69	46	42	<b>54</b>
6. WH 1105 (C)	20	51	48	67	56	59	<b>56</b>
7. DBW 88 (I)	03	69	46	68	58	63	<b>61</b>
8. HD 3086 (I)	16	64	50	59	69	50	<b>58</b>
9. PBW 677	11	67	44	63	51	48	<b>55</b>
10. PBW 692	14	60	48	74	65	56	<b>61</b>
11. PBW 695	22	75	57	81	56	72	<b>68</b>
12. PBW 697	01	64	63	66	61	74	<b>66</b>
13. PBW 698	17	49	46	69	52	57	<b>55</b>
14. TL 2995	02	87	75	83	84	67	<b>79</b>
15. WH 1154	13	75	59	58	57	64	<b>63</b>
16. WH 1156	04	42	52	69	66	39	<b>54</b>
17. WH 1157	09	60	44	57	53	60	<b>55</b>
18. HUW 675	19	69	52	72	54	73	<b>64</b>
19. HD 3128	08	70	48	63	59	50	<b>58</b>
20. HD 3132	12	66	60	67	50	60	<b>61</b>
21. HD 3133	18	69	52	58	52	76	<b>61</b>
22. DBW 95	06	48	52	64	40	72	<b>55</b>
23. K 1204	21	60	51	63	49	49	<b>54</b>
<b>Mean</b>		<b>65</b>	<b>53</b>	<b>67</b>	<b>57</b>	<b>59</b>	<b>60</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	63	58	77	71	54	<b>65</b>
2. PBW 590 (C)	10	74	49	71	67	61	<b>64</b>
3. WH 1021 (C)	05	61	53	74	57	52	<b>59</b>
4. HD 3059 (C)	06	76	68	69	67	49	<b>66</b>
5. DBW 90 (I)	09	76	64	81	62	69	<b>70</b>
6. WH 1124 (I)	04	69	64	81	63	67	<b>69</b>
7. PBW 702	03	66	62	73	66	62	<b>66</b>
8. PBW 703	02	62	57	73	73	56	<b>64</b>
9. HD 3139	01	67	61	71	56	61	<b>63</b>
10. DBW 128	07	65	64	71	69	47	<b>63</b>
<b>Mean</b>		<b>68</b>	<b>60</b>	<b>74</b>	<b>65</b>	<b>58</b>	<b>65</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	66	-	58	-	49	<b>58</b>
2. WH 1080 (C)	04	64	-	52	-	56	<b>57</b>
3. PBW 660 (I)	01	70	-	62	-	66	<b>66</b>
4. PBW 706	05	67	-	53	-	61	<b>60</b>
5. WH 1164	02	34	-	50	-	41	<b>42</b>
<b>Mean</b>		<b>60</b>	-	<b>55</b>	-	<b>55</b>	<b>57</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	77	-	67	62	52	<b>65</b>
2. PBW 644 (C)	03	63	-	61	61	50	<b>59</b>
3. WH 1080 (C)	04	70	-	59	64	66	<b>65</b>
4. HD 3043 (C)	06	68	-	67	70	60	<b>66</b>
5. PBW 706	07	61	-	56	51	42	<b>53</b>
6. MP 1277	02	75	-	65	59	45	<b>61</b>
7. DBW 129	05	65	-	70	53	52	<b>60</b>
8. UAS 356	01	66	-	63	49	53	<b>58</b>
<b>Mean</b>		<b>68</b>	-	<b>64</b>	<b>59</b>	<b>53</b>	<b>61</b>

**Table 21: Grain Hardness Index of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	70	83	77	<b>77</b>
2.	DBW 39 (C)	08	67	70	74	<b>70</b>
3.	HD 2733 (C)	05	68	73	76	<b>72</b>
4.	NW 5054 (I)	06	62	59	65	<b>62</b>
5.	K 1006 (I)	13	69	77	75	<b>74</b>
6.	HD 3127	02	46	39	35	<b>40</b>
7.	HD 3128	04	57	61	74	<b>64</b>
8.	PBW 677	11	58	73	74	<b>68</b>
9.	PBW 693	03	69	73	84	<b>75</b>
10.	WH 1132	07	72	76	70	<b>73</b>
11.	HUW 661	10	48	76	68	<b>64</b>
12.	DBW 98	01	76	83	81	<b>80</b>
13.	UP 2855	09	68	75	79	<b>74</b>
	<b>Mean</b>		<b>64</b>	<b>71</b>	<b>72</b>	<b>69</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	69	70	74	<b>71</b>
2.	DBW 107	03	62	72	74	<b>69</b>
3.	K 1114	08	61	79	77	<b>72</b>
4.	NW 2036 (C)	13	72	79	78	<b>76</b>
5.	DBW 14 (C)	12	53	63	66	<b>61</b>
6.	HD 2985 (C)	01	63	64	72	<b>66</b>
7.	HI 1563 (C)	09	79	70	74	<b>74</b>
8.	HD 3139	05	74	80	82	<b>79</b>
9.	DBW 126	11	68	67	71	<b>69</b>
10.	PBW 701	02	85	72	75	<b>77</b>
11.	PBW 702	10	76	77	61	<b>71</b>
12.	PBW 704	07	81	83	80	<b>81</b>
13.	HUW 677	04	73	84	74	<b>77</b>
	<b>Mean</b>		<b>70</b>	<b>74</b>	<b>74</b>	<b>73</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	59	77	70	<b>69</b>
2.	C 306 (C)	03	77	80	96	<b>84</b>
3.	K 8027 (C)	05	61	75	78	<b>71</b>
4.	HD 2888 (C)	04	68	77	85	<b>77</b>
5.	HUW 679	02	58	66	74	<b>66</b>
6.	UAS 356	06	53	64	71	<b>63</b>
	<b>Mean</b>		<b>63</b>	<b>73</b>	<b>79</b>	<b>72</b>

**Table 22: Grain Hardness Index of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	58	55	50	64	61	<b>58</b>
2.	GW 322 (C)	09	57	69	76	61	74	<b>67</b>
3.	HI 1544 (C)	10	74	67	62	66	77	<b>69</b>
4.	GW 451	03	59	55	52	62	72	<b>60</b>
5.	MACS 6604	07	61	62	58	62	60	<b>61</b>
	<b>Mean</b>		<b>62</b>	<b>62</b>	<b>60</b>	<b>63</b>	<b>69</b>	<b>63</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	59	69	82	47	66	<b>65</b>
2.	HD 2864 (C)	03	64	62	74	40	63	<b>61</b>
3.	HD 2932 (C)	01	59	73	65	55	63	<b>63</b>
4.	MP 3336 (C)	04	61	60	77	49	64	<b>62</b>
5.	GW 455	02	72	76	62	58	72	<b>68</b>
	<b>Mean</b>		<b>63</b>	<b>68</b>	<b>72</b>	<b>50</b>	<b>66</b>	<b>64</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	62	66	-	-	-	<b>64</b>
2.	PBW 689	17	49	51	-	-	-	<b>50</b>
3.	WH 1142	01	69	72	-	-	-	<b>71</b>
4.	HI 1500 (C)	16	65	61	-	-	-	<b>63</b>
5.	MP 3288 (C)	15	64	77	-	-	-	<b>71</b>
6.	NIAW 2030	03	69	81	-	-	-	<b>75</b>
7.	MP 1279	11	62	58	-	-	-	<b>60</b>
8.	K 1215	04	66	54	-	-	-	<b>60</b>
9.	K 1217	02	80	86	-	-	-	<b>83</b>
10.	CG 1010	07	73	68	-	-	-	<b>71</b>
	<b>Mean</b>		<b>66</b>	<b>67</b>	-	-	-	<b>67</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	58	54	-	-	-	<b>56</b>
2.	HI 1500 (C)	01	76	73	-	-	-	<b>75</b>
3.	MP 3288 (C)	02	62	60	-	-	-	<b>61</b>
4.	HI 8627 (C) (d)	04	54	75	-	-	-	<b>65</b>
5.	HD 3146	05	69	51	-	-	-	<b>60</b>
	<b>Mean</b>		<b>64</b>	<b>63</b>	-	-	-	<b>63</b>

**Table 23: Grain Hardness Index of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	56	71	67	<b>65</b>
2. MACS 6478 (I)	04	59	76	59	<b>65</b>
3. MACS 6604	07	45	63	58	<b>55</b>
<b>Mean</b>		<b>53</b>	<b>70</b>	<b>61</b>	<b>62</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	60	65	66	<b>64</b>
2. Raj 4083 (C)	02	77	82	68	<b>76</b>
3. HD 3090 (I)	04	75	71	65	<b>70</b>
4. HUW 677	01	66	77	67	<b>70</b>
5. UP 2864	05	59	59	60	<b>59</b>
6. K 1213	06	63	63	57	<b>61</b>
<b>Mean</b>		<b>67</b>	<b>70</b>	<b>64</b>	<b>67</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	76	-	<b>76</b>
2. NIAW 1994	05	-	79	-	<b>79</b>
3. NI 5439 (C)	02	-	85	-	<b>85</b>
4. NIAW 1415 (C)	06	-	80	-	<b>80</b>
5. NIAW 2030	01	-	82	-	<b>82</b>
<b>Mean</b>		-	<b>80</b>	-	<b>80</b>

**Table 24: Grain Hardness Index of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	78	99	74	85	<b>84</b>
2. HW 2044 (C)	05	82	75	61	67	<b>71</b>
3. HW 5216 (C)	02	76	80	66	82	<b>76</b>
4. UAS 358	03	84	74	76	70	<b>76</b>
5. MACS 6507	04	67	64	55	70	<b>64</b>
<b>Mean</b>		<b>77</b>	<b>78</b>	<b>66</b>	<b>75</b>	<b>74</b>



**Table 25: Sedimentation Value (ml) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	36	35	44	<b>38</b>
2. VL 804 (C)	01	32	38	45	<b>38</b>
3. VL 907 (C)	04	38	48	43	<b>43</b>
4. HS 507 (C)	03	39	36	43	<b>39</b>
5. HPW 349 (C)	05	56	48	52	<b>52</b>
6. HS 562	02	40	44	45	<b>43</b>
<b>Mean</b>		<b>40</b>	<b>42</b>	<b>45</b>	<b>42</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	42	34	35	<b>37</b>
2. VL 804 (C)	01	41	35	36	<b>37</b>
3. VL 907 (C)	04	42	46	38	<b>42</b>
4. HS 507 (C)	03	46	38	36	<b>40</b>
5. HPW 349 (C)	05	56	54	48	<b>53</b>
6. HS 562	02	45	38	41	<b>41</b>
<b>Mean</b>		<b>45</b>	<b>41</b>	<b>39</b>	<b>42</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	49	52	54	<b>52</b>
2. HS 277 (C)	12	39	36	33	<b>36</b>
3. VL 829 (C)	13	42	38	39	<b>40</b>
4. HPW 251 (C)	03	34	39	31	<b>35</b>
5. HS 542 (I)	09	52	38	40	<b>43</b>
6. HPW 400	02	50	45	57	<b>51</b>
7. HPW 401	04	56	44	52	<b>51</b>
8. HS 590	10	51	45	48	<b>48</b>
9. HS 591	11	46	45	47	<b>46</b>
10. HS 595	08	49	52	52	<b>51</b>
11. VL 1003	06	41	35	32	<b>36</b>
12. VL 1004	07	33	38	38	<b>36</b>
13. UP 2890	01	37	34	38	<b>36</b>
<b>Mean</b>		<b>45</b>	<b>42</b>	<b>43</b>	<b>43</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	47	33	37	<b>39</b>
2. HS 490 (C)	08	42	37	34	<b>38</b>
3. HS 577	12	47	34	36	<b>39</b>
4. HS 592	04	53	55	60	<b>56</b>
5. HS 593	10	44	35	34	<b>38</b>
6. HS 594	02	60	58	65	<b>61</b>
7. HPW 410	03	53	40	53	<b>49</b>
8. HPW 411	01	39	33	47	<b>40</b>
9. HPW 412	11	44	33	39	<b>39</b>
10. VL 3002	06	47	40	44	<b>44</b>
11. VL 3004	09	47	38	42	<b>42</b>
12. VL 3005	13	46	36	39	<b>40</b>
13. VL 3006	05	37	35	35	<b>36</b>
14. UP 2891	14	33	36	36	<b>35</b>
<b>Mean</b>		<b>46</b>	<b>39</b>	<b>43</b>	<b>42</b>

**Table 26: Sedimentation Value (ml) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	60	54	65	65	57	<b>60</b>
2. WH 1138	10	56	53	58	62	48	<b>55</b>
3. HUW 666	23	59	60	65	61	58	<b>61</b>
4. DPW 621-50 (C)	15	60	57	59	60	58	<b>59</b>
5. HD 2967 (C)	07	60	50	57	59	59	<b>57</b>
6. WH 1105 (C)	20	57	59	67	60	62	<b>61</b>
7. DBW 88 (I)	03	53	52	52	61	57	<b>55</b>
8. HD 3086 (I)	16	58	51	58	56	47	<b>54</b>
9. PBW 677	11	60	49	59	54	55	<b>55</b>
10. PBW 692	14	60	50	60	59	60	<b>58</b>
11. PBW 695	22	52	54	59	52	54	<b>54</b>
12. PBW 697	01	40	36	42	48	40	<b>41</b>
13. PBW 698	17	44	39	50	44	44	<b>44</b>
14. TL 2995	02	35	33	30	36	34	<b>34</b>
15. WH 1154	13	55	56	59	55	48	<b>55</b>
16. WH 1156	04	55	49	57	58	52	<b>54</b>
17. WH 1157	09	55	46	52	58	46	<b>51</b>
18. HUW 675	19	61	56	63	57	60	<b>59</b>
19. HD 3128	08	26	35	29	34	26	<b>30</b>
20. HD 3132	12	55	53	57	58	59	<b>56</b>
21. HD 3133	18	48	41	44	38	42	<b>43</b>
22. DBW 95	06	63	53	63	52	50	<b>56</b>
23. K 1204	21	53	50	58	50	51	<b>52</b>
<b>Mean</b>		<b>53</b>	<b>49</b>	<b>55</b>	<b>54</b>	<b>51</b>	<b>52</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	51	46	51	53	58	<b>52</b>
2. PBW 590 (C)	10	45	45	53	50	48	<b>48</b>
3. WH 1021 (C)	05	40	34	42	35	35	<b>37</b>
4. HD 3059 (C)	06	52	52	54	54	59	<b>54</b>
5. DBW 90 (I)	09	50	47	52	51	57	<b>51</b>
6. WH 1124 (I)	04	51	50	55	59	53	<b>54</b>
7. PBW 702	03	46	42	53	42	41	<b>45</b>
8. PBW 703	02	55	48	55	51	51	<b>52</b>
9. HD 3139	01	58	48	56	54	52	<b>54</b>
10. DBW 128	07	52	49	52	60	50	<b>53</b>
<b>Mean</b>		<b>50</b>	<b>46</b>	<b>52</b>	<b>51</b>	<b>50</b>	<b>50</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	45	-	43	-	50	<b>46</b>
2. WH 1080 (C)	04	51	-	60	-	58	<b>56</b>
3. PBW 660 (I)	01	42	-	46	-	43	<b>44</b>
4. PBW 706	05	56	-	50	-	43	<b>50</b>
5. WH 1164	02	55	-	50	-	47	<b>51</b>
<b>Mean</b>		<b>50</b>	-	<b>50</b>	-	<b>48</b>	<b>49</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	43	-	42	50	40	<b>44</b>
2. PBW 644 (C)	03	42	-	45	50	41	<b>45</b>
3. WH 1080 (C)	04	60	-	51	53	57	<b>55</b>
4. HD 3043 (C)	06	43	-	42	41	39	<b>41</b>
5. PBW 706	07	56	-	54	54	50	<b>54</b>
6. MP 1277	02	53	-	61	55	56	<b>56</b>
7. DBW 129	05	56	-	50	54	54	<b>54</b>
8. UAS 356	01	49	-	46	43	44	<b>46</b>
<b>Mean</b>		<b>50</b>	-	<b>49</b>	<b>50</b>	<b>48</b>	<b>49</b>

**Table 27: Sedimentation Value (ml) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	33	38	32	34
2.	DBW 39 (C)	08	37	41	40	39
3.	HD 2733 (C)	05	43	41	38	41
4.	NW 5054 (I)	06	50	53	53	52
5.	K 1006 (I)	13	31	34	39	35
6.	HD 3127	02	35	46	41	41
7.	HD 3128	04	33	32	40	35
8.	PBW 677	11	47	52	48	49
9.	PBW 693	03	35	38	37	37
10.	WH 1132	07	44	58	54	52
11.	HUW 661	10	37	44	42	41
12.	DBW 98	01	44	59	52	52
13.	UP 2855	09	40	40	41	40
	<b>Mean</b>		<b>39</b>	<b>44</b>	<b>43</b>	<b>42</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	52	58	44	51
2.	DBW 107	03	42	40	36	39
3.	K 1114	08	47	46	42	45
4.	NW 2036 (C)	13	50	51	42	48
5.	DBW 14 (C)	12	41	45	40	42
6.	HD 2985 (C)	01	50	55	45	50
7.	HI 1563 (C)	09	45	47	39	44
8.	HD 3139	05	52	55	51	53
9.	DBW 126	11	51	53	47	50
10.	PBW 701	02	42	39	42	41
11.	PBW 702	10	45	43	40	43
12.	PBW 704	07	50	47	44	47
13.	HUW 677	04	45	54	42	47
	<b>Mean</b>		<b>47</b>	<b>49</b>	<b>43</b>	<b>46</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	43	50	50	48
2.	C 306 (C)	03	44	40	37	40
3.	K 8027 (C)	05	42	50	46	46
4.	HD 2888 (C)	04	35	42	42	40
5.	HUW 679	02	50	43	51	48
6.	UAS 356	06	45	49	49	48
	<b>Mean</b>		<b>43</b>	<b>46</b>	<b>46</b>	<b>45</b>

**Table 28: Sedimentation Value (ml) of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	44	49	41	43	51	<b>46</b>
2.	GW 322 (C)	09	34	45	44	32	41	<b>39</b>
3.	HI 1544 (C)	10	43	47	49	42	45	<b>45</b>
4.	GW 451	03	51	43	48	43	50	<b>47</b>
5.	MACS 6604	07	55	52	54	54	60	<b>55</b>
	<b>Mean</b>		<b>45</b>	<b>47</b>	<b>47</b>	<b>43</b>	<b>49</b>	<b>46</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	40	45	46	38	41	<b>42</b>
2.	HD 2864 (C)	03	39	46	51	42	50	<b>46</b>
3.	HD 2932 (C)	01	45	54	59	44	50	<b>50</b>
4.	MP 3336 (C)	04	33	43	48	32	42	<b>40</b>
5.	GW 455	02	42	50	55	44	49	<b>48</b>
	<b>Mean</b>		<b>40</b>	<b>48</b>	<b>52</b>	<b>40</b>	<b>46</b>	<b>45</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	35	40	-	-	-	<b>38</b>
2.	PBW 689	17	40	44	-	-	-	<b>42</b>
3.	WH 1142	01	43	46	-	-	-	<b>45</b>
4.	HI 1500 (C)	16	46	53	-	-	-	<b>50</b>
5.	MP 3288 (C)	15	52	45	-	-	-	<b>49</b>
6.	NIAW 2030	03	45	47	-	-	-	<b>46</b>
7.	MP 1279	11	48	53	-	-	-	<b>51</b>
8.	K 1215	04	47	53	-	-	-	<b>50</b>
9.	K 1217	02	43	40	-	-	-	<b>42</b>
10.	CG 1010	07	43	45	-	-	-	<b>44</b>
	<b>Mean</b>		<b>44</b>	<b>47</b>	-	-	-	<b>45</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	47	54	-	-	-	<b>51</b>
2.	HI 1500 (C)	01	49	45	-	-	-	<b>47</b>
3.	MP 3288 (C)	02	53	55	-	-	-	<b>54</b>
4.	HI 8627 (C) (d)	04	32	28	-	-	-	<b>30</b>
5.	HD 3146	05	38	35	-	-	-	<b>37</b>
	<b>Mean</b>		<b>44</b>	<b>43</b>	-	-	-	<b>44</b>

**Table 29: Sedimentation Value (ml) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	37	35	40	<b>37</b>
2. MACS 6478 (I)	04	48	46	48	<b>47</b>
3. MACS 6604	07	51	51	52	<b>51</b>
<b>Mean</b>		<b>45</b>	<b>44</b>	<b>47</b>	<b>45</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	42	49	44	<b>45</b>
2. Raj 4083 (C)	02	53	43	47	<b>48</b>
3. HD 3090 (I)	04	40	38	45	<b>41</b>
4. HUW 677	01	37	47	42	<b>42</b>
5. UP 2864	05	43	42	43	<b>43</b>
6. K 1213	06	48	40	49	<b>46</b>
<b>Mean</b>		<b>44</b>	<b>43</b>	<b>45</b>	<b>44</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	52	-	<b>52</b>
2. NIAW 1994	05	-	44	-	<b>44</b>
3. NI 5439 (C)	02	-	58	-	<b>58</b>
4. NIAW 1415 (C)	06	-	51	-	<b>51</b>
5. NIAW 2030	01	-	52	-	<b>52</b>
<b>Mean</b>		-	<b>51</b>	-	<b>51</b>

**Table 30: Sedimentation Value (ml) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	38	44	36	47	<b>41</b>
2. HW 2044 (C)	05	42	49	38	44	<b>43</b>
3. HW 5216 (C)	02	37	45	35	42	<b>40</b>
4. UAS 358	03	40	45	32	44	<b>40</b>
5. MACS 6507	04	52	55	57	54	<b>55</b>
<b>Mean</b>		<b>42</b>	<b>48</b>	<b>40</b>	<b>46</b>	<b>44</b>

**Table 31: Moisture Content (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	11.22	12.21	10.60	<b>11.34</b>
2. VL 804 (C)	01	11.28	13.00	10.64	<b>11.64</b>
3. VL 907 (C)	04	11.12	12.54	10.43	<b>11.36</b>
4. HS 507 (C)	03	11.17	12.60	10.72	<b>11.50</b>
5. HPW 349 (C)	05	10.99	12.24	10.25	<b>11.16</b>
6. HS 562	02	11.05	12.36	10.66	<b>11.36</b>
<b>Mean</b>		<b>11.14</b>	<b>12.49</b>	<b>10.55</b>	<b>11.39</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	10.10	10.26	11.43	<b>10.60</b>
2. VL 804 (C)	01	10.14	10.53	11.63	<b>10.77</b>
3. VL 907 (C)	04	9.99	9.91	11.30	<b>10.40</b>
4. HS 507 (C)	03	10.25	10.06	11.59	<b>10.63</b>
5. HPW 349 (C)	05	10.14	9.73	11.51	<b>10.46</b>
6. HS 562	02	10.20	10.38	11.48	<b>10.69</b>
<b>Mean</b>		<b>10.14</b>	<b>10.15</b>	<b>11.49</b>	<b>10.59</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	10.66	9.69	10.77	<b>10.37</b>
2. HS 277 (C)	12	10.25	9.61	11.39	<b>10.42</b>
3. VL 829 (C)	13	10.43	9.89	10.94	<b>10.42</b>
4. HPW 251 (C)	03	10.28	9.58	11.10	<b>10.32</b>
5. HS 542 (I)	09	10.25	9.31	11.16	<b>10.24</b>
6. HPW 400	02	10.67	9.45	10.88	<b>10.33</b>
7. HPW 401	04	10.42	10.14	11.18	<b>10.58</b>
8. HS 590	10	10.05	9.49	11.57	<b>10.37</b>
9. HS 591	11	10.15	9.58	10.94	<b>10.22</b>
10. HS 595	08	10.32	9.56	10.90	<b>10.26</b>
11. VL 1003	06	10.16	9.38	10.87	<b>10.14</b>
12. VL 1004	07	10.36	9.61	11.04	<b>10.34</b>
13. UP 2890	01	10.36	9.90	10.70	<b>10.32</b>
<b>Mean</b>		<b>10.34</b>	<b>9.63</b>	<b>11.03</b>	<b>10.33</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	10.93	11.51	10.85	<b>11.10</b>
2. HS 490 (C)	08	11.03	11.67	11.00	<b>11.23</b>
3. HS 577	12	10.85	11.49	10.54	<b>10.96</b>
4. HS 592	04	10.69	11.48	10.68	<b>10.95</b>
5. HS 593	10	10.89	11.58	10.52	<b>11.00</b>
6. HS 594	02	10.80	11.53	10.54	<b>10.96</b>
7. HPW 410	03	10.85	11.49	10.82	<b>11.05</b>
8. HPW 411	01	11.10	11.70	10.79	<b>11.20</b>
9. HPW 412	11	10.79	11.53	10.40	<b>10.91</b>
10. VL 3002	06	10.72	11.31	10.37	<b>10.80</b>
11. VL 3004	09	10.70	11.61	10.62	<b>10.98</b>
12. VL 3005	13	11.10	11.43	10.65	<b>11.06</b>
13. VL 3006	05	11.02	11.61	10.54	<b>11.06</b>
14. UP 2891	14	11.04	11.71	10.66	<b>11.14</b>
<b>Mean</b>		<b>10.89</b>	<b>11.55</b>	<b>10.64</b>	<b>11.03</b>

**Table 32: Moisture Content (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	11.09	8.79	10.02	11.33	8.83	<b>10.01</b>
2. WH 1138	10	10.52	8.62	9.97	11.56	9.13	<b>9.96</b>
3. HUW 666	23	10.69	8.61	10.24	11.44	9.19	<b>10.03</b>
4. DPW 621-50 (C)	15	10.58	8.97	10.27	11.46	9.26	<b>10.11</b>
5. HD 2967 (C)	07	10.15	8.45	9.91	11.38	9.28	<b>9.83</b>
6. WH 1105 (C)	20	10.69	8.49	10.23	11.44	8.98	<b>9.97</b>
7. DBW 88 (I)	03	10.75	8.45	9.96	11.56	9.16	<b>9.98</b>
8. HD 3086 (I)	16	10.54	8.71	9.97	11.08	9.39	<b>9.94</b>
9. PBW 677	11	10.49	8.45	10.12	11.56	9.09	<b>9.94</b>
10. PBW 692	14	10.43	8.38	10.08	11.45	9.02	<b>9.87</b>
11. PBW 695	22	10.52	8.52	9.94	11.28	9.16	<b>9.88</b>
12. PBW 697	01	10.19	8.44	10.08	11.30	8.95	<b>9.79</b>
13. PBW 698	17	10.47	8.22	9.70	11.32	8.78	<b>9.70</b>
14. TL 2995	02	10.84	9.11	10.46	11.62	9.96	<b>10.40</b>
15. WH 1154	13	10.53	8.65	9.77	11.41	9.14	<b>9.90</b>
16. WH 1156	04	10.63	8.56	9.93	11.43	9.26	<b>9.96</b>
17. WH 1157	09	10.69	8.25	9.92	11.21	7.65	<b>9.54</b>
18. HUW 675	19	10.51	8.61	10.14	11.34	9.58	<b>10.04</b>
19. HD 3128	08	10.52	9.19	10.29	11.40	9.53	<b>10.19</b>
20. HD 3132	12	10.61	8.40	10.07	11.68	9.10	<b>9.97</b>
21. HD 3133	18	11.05	8.69	10.08	11.55	9.24	<b>10.12</b>
22. DBW 95	06	10.65	8.65	10.01	11.33	9.34	<b>10.00</b>
23. K 1204	21	10.48	8.46	10.49	11.35	9.44	<b>10.04</b>
<b>Mean</b>		<b>10.59</b>	<b>8.59</b>	<b>10.07</b>	<b>11.41</b>	<b>9.15</b>	<b>9.96</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	10.35	8.47	9.49	11.08	10.04	<b>9.89</b>
2. PBW 590 (C)	10	10.45	8.29	9.73	11.36	9.65	<b>9.90</b>
3. WH 1021 (C)	05	10.24	8.11	9.51	11.28	9.87	<b>9.80</b>
4. HD 3059 (C)	06	10.45	8.54	9.67	11.22	10.26	<b>10.03</b>
5. DBW 90 (I)	09	10.28	8.65	9.90	11.22	10.12	<b>10.03</b>
6. WH 1124 (I)	04	10.42	8.56	9.70	11.43	10.09	<b>10.04</b>
7. PBW 702	03	10.36	8.33	9.65	11.34	9.84	<b>9.90</b>
8. PBW 703	02	10.19	8.14	9.57	11.10	9.99	<b>9.80</b>
9. HD 3139	01	10.16	8.40	9.39	11.02	9.69	<b>9.73</b>
10. DBW 128	07	10.02	8.15	9.39	11.74	9.98	<b>9.86</b>
<b>Mean</b>		<b>10.29</b>	<b>8.36</b>	<b>9.60</b>	<b>11.28</b>	<b>9.95</b>	<b>9.90</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	11.02	-	10.55	-	9.81	<b>10.46</b>
2. WH 1080 (C)	04	10.97	-	10.84	-	9.65	<b>10.49</b>
3. PBW 660 (I)	01	11.05	-	10.94	-	10.38	<b>10.79</b>
4. PBW 706	05	10.99	-	10.94	-	10.15	<b>10.69</b>
5. WH 1164	02	11.04	-	10.82	-	9.83	<b>10.56</b>
<b>Mean</b>		<b>11.01</b>	<b>-</b>	<b>10.82</b>	<b>-</b>	<b>9.96</b>	<b>10.60</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	11.19	-	10.73	11.43	9.60	<b>10.74</b>
2. PBW 644 (C)	03	11.24	-	10.68	11.54	10.11	<b>10.89</b>
3. WH 1080 (C)	04	11.42	-	10.77	11.56	9.38	<b>10.78</b>
4. HD 3043 (C)	06	11.05	-	10.96	11.49	9.71	<b>10.80</b>
5. PBW 706	07	11.15	-	10.84	11.58	9.71	<b>10.82</b>
6. MP 1277	02	11.03	-	10.93	11.56	9.49	<b>10.75</b>
7. DBW 129	05	11.13	-	10.68	11.52	9.72	<b>10.76</b>
8. UAS 356	01	10.97	-	10.62	11.55	9.82	<b>10.74</b>
<b>Mean</b>		<b>11.15</b>	<b>-</b>	<b>10.78</b>	<b>11.53</b>	<b>9.69</b>	<b>10.79</b>

**Table 33: Moisture Content (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

	Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>						
1.	K 0307 (C)	12	10.29	11.77	11.84	<b>11.30</b>
2.	DBW 39 (C)	08	10.51	11.71	11.77	<b>11.33</b>
3.	HD 2733 (C)	05	10.24	11.76	11.80	<b>11.27</b>
4.	NW 5054 (I)	06	10.32	11.62	11.99	<b>11.31</b>
5.	K 1006 (I)	13	10.40	11.76	12.00	<b>11.88</b>
6.	HD 3127	02	9.69	11.64	11.84	<b>11.06</b>
7.	HD 3128	04	10.37	11.69	11.95	<b>11.34</b>
8.	PBW 677	11	11.09	11.51	11.80	<b>11.47</b>
9.	PBW 693	03	10.32	11.57	11.73	<b>11.21</b>
10.	WH 1132	07	10.16	11.76	11.99	<b>11.30</b>
11.	HUW 661	10	10.16	11.84	11.87	<b>11.29</b>
12.	DBW 98	01	10.36	11.75	11.73	<b>11.28</b>
13.	UP 2855	09	10.26	11.77	11.79	<b>11.27</b>
	<b>Mean</b>		<b>10.31</b>	<b>11.70</b>	<b>11.85</b>	<b>11.29</b>
<b>Irrigated, Late Sown</b>						
1.	HD 3118	06	11.11	10.99	11.33	<b>11.14</b>
2.	DBW 107	03	11.39	10.88	11.49	<b>11.25</b>
3.	K 1114	08	10.99	10.81	11.32	<b>11.04</b>
4.	NW 2036 (C)	13	11.03	10.66	11.90	<b>11.20</b>
5.	DBW 14 (C)	12	10.94	10.91	11.43	<b>11.09</b>
6.	HD 2985 (C)	01	10.84	11.13	11.41	<b>11.13</b>
7.	HI 1563 (C)	09	10.84	10.93	11.44	<b>11.07</b>
8.	HD 3139	05	11.04	10.70	11.26	<b>11.00</b>
9.	DBW 126	11	10.36	10.65	11.28	<b>10.76</b>
10.	PBW 701	02	11.05	10.76	11.40	<b>11.07</b>
11.	PBW 702	10	10.71	11.41	11.37	<b>11.16</b>
12.	PBW 704	07	10.77	10.99	11.68	<b>11.15</b>
13.	HUW 677	04	10.84	11.02	11.31	<b>11.06</b>
	<b>Mean</b>		<b>10.92</b>	<b>10.91</b>	<b>11.43</b>	<b>11.09</b>
<b>Rainfed, Timely Sown</b>						
1.	BRW 3723	01	9.91	11.79	12.86	<b>11.52</b>
2.	C 306 (C)	03	9.67	11.54	13.35	<b>11.52</b>
3.	K 8027 (C)	05	9.48	11.57	12.87	<b>11.31</b>
4.	HD 2888 (C)	04	9.53	11.56	13.21	<b>11.43</b>
5.	HUW 679	02	9.52	11.61	12.89	<b>11.34</b>
6.	UAS 356	06	9.38	11.47	13.03	<b>11.29</b>
	<b>Mean</b>		<b>9.58</b>	<b>11.59</b>	<b>13.04</b>	<b>11.40</b>



**Table 34: Moisture Content (%) of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	8.42	9.06	9.09	8.59	9.61	<b>8.95</b>
2.	GW 322 (C)	09	8.42	9.14	9.51	8.57	9.91	<b>9.11</b>
3.	HI 1544 (C)	10	8.67	9.28	9.71	8.84	9.92	<b>9.28</b>
4.	GW 451	03	8.85	9.01	9.29	8.80	9.81	<b>9.15</b>
5.	MACS 6604	07	8.20	9.10	9.78	8.64	9.99	<b>9.14</b>
	<b>Mean</b>		<b>8.51</b>	<b>9.12</b>	<b>9.48</b>	<b>8.69</b>	<b>9.85</b>	<b>9.13</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	8.70	8.90	10.23	8.53	8.88	<b>9.05</b>
2.	HD 2864 (C)	03	8.06	8.98	10.10	8.26	8.56	<b>8.79</b>
3.	HD 2932 (C)	01	8.43	8.92	9.98	8.49	8.52	<b>8.87</b>
4.	MP 3336 (C)	04	8.81	9.08	10.13	8.74	8.84	<b>9.12</b>
5.	GW 455	02	8.68	9.09	10.22	8.82	8.91	<b>9.14</b>
	<b>Mean</b>		<b>8.54</b>	<b>8.99</b>	<b>10.13</b>	<b>8.57</b>	<b>8.74</b>	<b>8.99</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	10.52	9.09	-	-	-	<b>9.81</b>
2.	PBW 689	17	10.90	9.42	-	-	-	<b>10.16</b>
3.	WH 1142	01	10.25	9.42	-	-	-	<b>9.84</b>
4.	HI 1500 (C)	16	10.75	9.29	-	-	-	<b>10.02</b>
5.	MP 3288 (C)	15	10.96	10.69	-	-	-	<b>10.83</b>
6.	NIAW 2030	03	10.67	9.54	-	-	-	<b>10.11</b>
7.	MP 1279	11	10.26	9.03	-	-	-	<b>9.65</b>
8.	K 1215	04	10.43	9.37	-	-	-	<b>9.90</b>
9.	K 1217	02	10.60	9.55	-	-	-	<b>10.08</b>
10.	CG 1010	07	10.77	9.65	-	-	-	<b>10.21</b>
	<b>Mean</b>		<b>10.61</b>	<b>9.51</b>	-	-	-	<b>10.06</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	9.27	9.32	-	-	-	<b>9.30</b>
2.	HI 1500 (C)	01	9.49	9.15	-	-	-	<b>9.32</b>
3.	MP 3288 (C)	02	9.42	10.23	-	-	-	<b>9.83</b>
4.	HI 8627 (C) (d)	04	9.43	10.07	-	-	-	<b>9.75</b>
5.	HD 3146	05	9.68	9.28	-	-	-	<b>9.48</b>
	<b>Mean</b>		<b>9.46</b>	<b>9.61</b>	-	-	-	<b>9.53</b>

**Table 35: Moisture Content (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	9.77	12.43	8.83	<b>10.34</b>
2. MACS 6478 (I)	04	9.94	12.43	8.91	<b>10.43</b>
3. MACS 6604	07	9.97	12.38	8.89	<b>10.41</b>
<b>Mean</b>		<b>9.89</b>	<b>12.41</b>	<b>8.88</b>	<b>10.39</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	9.55	10.30	9.12	<b>9.66</b>
2. Raj 4083 (C)	02	9.75	10.14	9.05	<b>9.65</b>
3. HD 3090 (I)	04	9.95	10.38	8.92	<b>9.75</b>
4. HUW 677	01	10.06	10.29	9.07	<b>9.81</b>
5. UP 2864	05	9.49	10.09	8.66	<b>9.41</b>
6. K 1213	06	9.64	10.04	9.00	<b>9.56</b>
<b>Mean</b>		<b>9.74</b>	<b>10.21</b>	<b>8.97</b>	<b>9.64</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	10.78	-	<b>10.78</b>
2. NIAW 1994	05	-	10.70	-	<b>10.70</b>
3. NI 5439 (C)	02	-	10.51	-	<b>10.51</b>
4. NIAW 1415 (C)	06	-	10.54	-	<b>10.54</b>
5. NIAW 2030	01	-	10.64	-	<b>10.64</b>
<b>Mean</b>		-	<b>10.63</b>	-	<b>10.63</b>

**Table 36: Moisture Content (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	11.19	12.11	12.05	12.28	<b>11.91</b>
2. HW 2044 (C)	05	11.09	12.25	12.35	12.12	<b>11.95</b>
3. HW 5216 (C)	02	11.76	11.85	11.86	12.03	<b>11.88</b>
4. UAS 358	03	11.03	11.87	12.40	11.93	<b>11.81</b>
5. MACS 6507	04	10.96	11.74	12.11	12.15	<b>11.74</b>
<b>Mean</b>		<b>11.21</b>	<b>11.96</b>	<b>12.15</b>	<b>12.10</b>	<b>11.86</b>

**Table 37: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	5+10	2*	7	8
2. VL 804 (C)	01	2+12	N	7+8	6
3. VL 907 (C)	04	5+10	1	7	8
4. HS 507 (C)	03	5+10	1	7+8	10
5. HPW 349 (C)	05	5+10	2*	17+18	10
6. HS 562	02	5+10	1	17+18	10
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	5+10	2*	7	8
2. VL 804 (C)	01	2+12	N	7+8	6
3. VL 907 (C)	04	5+10	1	7	8
4. HS 507 (C)	03	5+10	1	7+8	10
5. HPW 349 (C)	05	5+10	2*	17+18	10
6. HS 562	02	5+10	1	17+18	10
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	5+10	2*	17+18	10
2. HS 277 (C)	12	5+10	N	7+9	7
3. VL 829 (C)	13	2+12	1	7+9	7
4. HPW 251 (C)	03	5+10	2*	7+9	9
5. HS 542 (I)	09	5+10	2*	7	8
6. HPW 400	02	5+10	1	7+8	10
7. HPW 401	04	2+12	2*	7+9	7
8. HS 590	10	5+10	1	7	8
9. HS 591	11	5+10	2*	13+16	10
10. HS 595	08	5+10	2*	7	8
11. VL 1003	06	2+12	2*	7+9	7
12. VL 1004	07	2+12	2*	7	6
13. UP 2890	01	2+12	2*	17+18	8
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	2+12	2*	7+8	8
2. HS 490 (C)	08	2+12	2*	7+8	8
3. HS 577	12	2+12	1	7	6
4. HS 592	04	5+10	2*	7	8
5. HS 593	10	5+10	N	7	6
6. HS 594	02	5+10	1	7	8
7. HPW 410	03	2+12	N	7+9	5
8. HPW 411	01	2+12	N	13+16	6
9. HPW 412	11	5+10	1	7	8
10. VL 3002	06	2+12	N	7	4
11. VL 3004	09	5+10	2*	7	8
12. VL 3005	13	2+12	1	7	6
13. VL 3006	05	2+12	2*	7	6
14. UP 2891	14	2+12	2*	7	6

**Table 38: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Irrigated, Timely Sown</b>					
1. PBW 681	05	5+10	2*	7	8
2. WH 1138	10	5+10	1	17+18	10
3. HUW 666	23	5+10	2*	17+18	10
4. DPW 621-50 (C)	15	5+10	2*	17+18	10
5. HD 2967 (C)	07	5+10	2*	17+18	10
6. WH 1105 (C)	20	5+10	2*	7	8
7. DBW 88 (I)	03	5+10	2*	17+18	10
8. HD 3086 (I)	16	5+10	1	17+18	10
9. PBW 677	11	5+10	N	13+16	8
10. PBW 692	14	5+10	2*	17+18	10
11. PBW 695	22	5+10	1	17+18	10
12. PBW 697	01	5+10	2*	17+18	10
13. PBW 698	17	5+10	2*	7+8	10
14. TL 2995	02	-	-	-	-
15. WH 1154	13	5+10	1	17+18	10
16. WH 1156	04	5+10	2*	7	8
17. WH 1157	09	5+10	2*	7	8
18. HUW 675	19	5+10	2*	17+18	10
19. HD 3128	08	2+12	2*	7	6
20. HD 3132	12	5+10	2*	17+18	10
21. HD 3133	18	5+10	1	7	8
22. DBW 95	06	5+10	2*	7	8
23. K 1204	21	5+10	1	7	8
<b>Irrigated Late Sown</b>					
1. WH 1129	08	5+10	1	17+18	<b>10</b>
2. PBW 590 (C)	10	5+10	2*	7+9	<b>9</b>
3. WH 1021 (C)	05	2+12	2*	7+8	<b>8</b>
4. HD 3059 (C)	06	5+10	2*	17+18	<b>10</b>
5. DBW 90 (I)	09	5+10	1	17+18	<b>10</b>
6. WH 1124 (I)	04	5+10	1	17+18	<b>10</b>
7. PBW 702	03	5+10	1	7+8	<b>10</b>
8. PBW 703	02	5+10	2*	7	<b>8</b>
9. HD 3139	01	5+10	2*	7+8	<b>10</b>
10. DBW 128	07	5+10	2*	17+18	<b>10</b>
<b>Rainfed, Timely Sown</b>					
1. PBW 644 (C)	03	2+12	2*	7+8	<b>8</b>
2. WH 1080 (C)	04	5+10	1	7	<b>8</b>
3. PBW 660 (I)	01	5+10	1	7	<b>8</b>
4. PBW 706	05	5+10	2*	7	<b>8</b>
5. WH 1164	02	5+10	2*	7	<b>8</b>
<b>Restricted Irrigation Timely Sown</b>					
1. WH 1142	08	5+10	1	7	<b>8</b>
2. PBW 644 (C)	03	2+12	1	7+8	<b>8</b>
3. WH 1080 (C)	04	5+10	1	7	<b>8</b>
4. HD 3043 (C)	06	5+10	2*	7	<b>8</b>
5. PBW 706	07	5+10	2*	7	<b>8</b>
6. MP 1277	02	5+10	2*	7	<b>8</b>
7. DBW 129	05	5+10	N	13+16	<b>8</b>
8. UAS 356	01	5+10	2*	7	<b>8</b>

**Table 39: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	2+12	2*	17+18	8
2. DBW 39 (C)	08	5+10	2*	7+9	9
3. HD 2733 (C)	05	5+10	N	7+9	7
4. NW 5054 (I)	06	5+10	2*	17+18	10
5. K 1006 (I)	13	2+12	2*	17+18	8
6. HD 3127	02	2+12	2*	7+8	8
7. HD 3128	04	2+12	2*	7	6
8. PBW 677	11	5+10	2*	13+16	10
9. PBW 693	03	5+10	1	17+18	10
10. WH 1132	07	5+10	1	17+18	10
11. HUW 661	10	5+10	2*	7	8
12. DBW 98	01	5+10	1	17+18	10
13. UP 2855	09	5+10	2*	13+16	10
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	5+10	2*	7	8
2. DBW 107	03	2+12	2*	7+8	8
3. K 1114	08	2+12	2*	7+8	8
4. NW 2036 (C)	13	5+10	1	7+9	9
5. DBW 14 (C)	12	2+12	2*	7+8	8
6. HD 2985 (C)	01	2+12	2*	17+18	8
7. HI 1563 (C)	09	2+12	2*	7+8	8
8. HD 3139	05	5+10	2*	7+8	10
9. DBW 126	11	5+10	N	7+8	8
10. PBW 701	02	5+10	1	7	8
11. PBW 702	10	5+10	1	7+8	10
12. PBW 704	07	2+12	2*	7+8	8
13. HUW 677	04	2+12	1	7+8	8
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	5+10	2*	17+18	10
2. C 306 (C)	03	2+12	N	20	4
3. K 8027 (C)	05	2+12	2*	17+18	8
4. HD 2888 (C)	04	2+12	N	20	4
5. HUW 679	02	5+10	2*	7+8	10
6. UAS 356	06	5+10	2*	7	8

**Table 40: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in Central Zone AVT's**

	Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Irrigated, Timely Sown</b>						
1.	MP 3382	05	2+12	2*	7+9	7
2.	GW 322 (C)	09	2+12	2*	7+8	8
3.	HI 1544 (C)	10	2+12	N	7+8	6
4.	GW 451	03	2+12	2*	17+18	8
5.	MACS 6604	07	5+10	2*	7	8
<b>Irrigated, Late Sown</b>						
1.	MP 4010 (C)	05	2+12	2*	17+18	8
2.	HD 2864 (C)	03	2+12	1	7+8	8
3.	HD 2932 (C)	01	2+12	2*	17+18	8
4.	MP 3336 (C)	04	2+12	2*	7+8	8
5.	GW 455	02	2+12	2*	7+8	8
<b>Rainfed, Timely Sown</b>						
1.	NIAW 1885	08	2+12	2*	7	6
2.	PBW 689	17	2+12	2*	7+9	7
3.	WH 1142	01	5+10	1	7	8
4.	HI 1500 (C)	16	2+12	N	20	4
5.	MP 3288 (C)	15	2+12	2*	7+9	7
6.	NIAW 2030	03	2+12	N	17+18	6
7.	MP 1279	11	5+10	1	17+18	10
8.	K 1215	04	5+10	2*	7	8
9.	K 1217	02	5+10	2*	7	8
10.	CG 1010	07	2+12	2*	17+18	8
<b>Restricted Irrigation, Timely Sown</b>						
1.	DBW 110	03	5+10	1	7	8
2.	HI 1500 (C)	01	2+12	N	20	4
3.	MP 3288 (C)	02	2+12	2*	7+9	7
4.	HI 8627 (C) (d)	04	-	-	-	-
5.	HD 3146	05	5+10	2*	7	8

**Table 41: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Irrigated, Timely Sown</b>						
1.	MACS 6222 (C)	02	2+12	2*	7+9	7
2.	MACS 6478 (I)	04	2+12	2*	17+18	8
3.	MACS 6604	07	5+10	2*	7	8
-						
<b>Irrigated, Late Sown</b>						
1.	HD 2932 (C)	03	2+12	2*	17+18	8
2.	Raj 4083 (C)	02	5+10	1	7+8	10
3.	HD 3090 (I)	04	5+10	1	7	8
4.	HUW 677	01	2+12	1	7+8	8
5.	UP 2864	05	5+10	2*	7	8
6.	K 1213	06	5+10	2*	17+18	10
<b>Rainfed, Timely Sown</b>						
1.	UAS 347	09	5+10	1	7	8
2.	NIAW 1994	05	2+12	2*	7+9	7
3.	NI 5439 (C)	02	2+12	N	17+18	6
4.	NIAW 1415 (C)	06	2+12	2*	7+9	7
5.	NIAW 2030	01	2+12	N	17+18	6

**Table 42: High Molecular Weight Glutenin Subunit of *T.aestivum* genotypes in Southern Hills Zone AVT's**

	Variety	Code	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
<b>Restricted Irrigation, Timely Sown</b>						
1.	CoW (W) 1 (C)	01	5+10	1	7+9	9
2.	HW 2044 (C)	05	2+12	N	7+8	6
3.	HW 5216 (C)	02	5+10	2*	7	8
4.	UAS 358	03	5+10	2*	7	8
5.	MACS 6507	04	2+12	2*	7+9	7

## ADVANCED VARIETAL TRIALS (*T. durum*)

### GRAIN CHARACTERISTICS

The *T. durum* entries were tested under Irrigated Timely Sown (ITS) condition in North Western Plains Zone (NWPZ), Central Zone (CZ) and Peninsular Zone (PZ). The entries were also tested under Rainfed Timely Sown (RTS) condition in Central Zone (CZ) and Peninsular Zone (PZ). One 1<sup>st</sup> year entry was tested against three durum and one *aestivum* checks in NWPZ. Under ITS condition of CZ, two 2<sup>nd</sup> year and three 1<sup>st</sup> year entries were tested against two durum checks. In RTS condition, two 2<sup>nd</sup> year and five 1<sup>st</sup> year entries were tested against two durum checks. Two 1<sup>st</sup> year entries were tested against two durum checks in PZ (ITS). One 2<sup>nd</sup> year and three 1<sup>st</sup> year entries were tested against one durum check in PZ (RTS).

#### (i) Grain Appearance Score (Table 43-45)

It is a subjective test and the parameters like grain size, shape, soundness, colour & luster are taken into consideration to score the grain appearance out of a total score of 10.0. This parameter merits consideration in grain trade. The highest score of 6.9 was recorded by the check PDW 291 and the zonal mean was 6.5 under ITS condition of NWPZ. All the entries including checks recorded >7.0 score and the zonal mean was 7.3 under ITS condition CZ. Under RTS condition of CZ, all the entries scored more than the best check, HI 8627 (6.9). The zonal means in the ITS and RTS conditions were 7.8 and 8.3 respectively. While no entry could surpass the best check UAS (8.1) under ITS condition, all the entries recorded higher values compared to the best check AKDW 2997-16 (8.0) under RTS condition of PZ.

#### (ii) Test Weight (Table 46-48)

This parameter is important for millers as it is positively correlated with flour recovery. It is an important quality parameter for durum wheat trading in the international market. In U.S grading system, durum wheat with 78.0 kg/hl and above test weight is classified in grade 1. The highest value of 81.0 kg/hl was recorded by the check PDW 314 and the zonal mean 79.5 kg/hl under the ITS condition of NWPZ. Among the three zones, NWPZ showed comparatively lower values. All the entries showed very high test weight values and were found comparable to the respective best checks under ITS and RTS conditions of CZ. The zonal means were



83.9 kg/hl and 81.6 kg/hl respectively. Similar was the situation under ITS and RTS conditions of PZ and the zonal means were 82.7 kg/hl and 81.5 kg/hl respectively.

**(iii) Protein Content (Table 49-51)**

It is an important quality parameter for making different products of wheat. More than 12.00% protein is required for making good quality pasta products. The lone 1<sup>st</sup> year entry, HD 4730 could not beat the best check, HD 2967 under ITS condition of NWPZ. The zonal mean was 11.22%. Similar was the situation under ITS condition of CZ and the zonal mean was 11.23%. However, under RTS condition, all the entries had an edge over the best check, A-9-30-1 (11.92%) and the zonal mean was 11.89%. In PZ, no entry could surpass the best check UAS 428 (12.38%) under ITS condition, whereas all the entries recorded higher values compared to the best check, AKDW 2997-16 (12.11%) in RTS condition. The zonal means were 12.08% and 13.56% respectively.

**(iv) Grain Hardness (Table 52-54)**

It is an important parameter as hard durum wheat is required for making good quality pasta products. The entries (39.3%) including checks were found to be hard as the index values were >75. None of the durum entry had <45 index.

**(v) Sedimentation Value (Table 55-57)**

This quality parameter indicates gluten strength and the value of 40 ml and above is required for making good quality pasta products. Under ITS condition of NWPZ, the check, PDW 233 recorded the higher value of 41 ml and the zonal mean was 40 ml. None of the entry could beat the best check, MPO 1215 under ITS condition of CZ. However, under RTS condition of CZ, the 1<sup>st</sup> year entries, UAS 451 and DDW 30 recorded higher value compared to the best check, A-9-30-1 (32 ml). The 1<sup>st</sup> year entries, DDW 27 (ITS condition) and HI 8754 (RTS condition) exhibited 40 ml value in PZ.

**(vi) Yellow Berry Incidence (Table 58-60)**

Yellow berry (starchiness, mealiness, non-vitreousness) is a physiological disorder due to protein imbalance and imparts undesirable white spots in dried pasta, thus lowering its cooking quality. The lowest incidence was exhibited by the bread wheat check, HD 2967 (0.2%) and all other checks and entry should >10.0% incidence under ITS condition of NWPZ. The zonal mean was 17.5%. All the entries including checks recorded 10.0% incidence under ITS condition of CZ whereas only

one 1<sup>st</sup> year entry, UAS 451 had 4.5% incidence under RTS condition. The zonal means were 20.3% and 24.0% respectively. In PZ, the trend was reverse under ITS condition (high incidence) and RTS condition (low incidence). The zonal means were 16.2% and 1.5% respectively.

#### **(vii) Yellow Pigment Content (Table 61-63)**

It imparts attractive colour to the pasta products and is considered to be an important quality character of durum wheat in many countries. It is a precursor of vitamin-A, hence has immense nutritional importance. Durum wheat with >7.0ppm  $\beta$ -carotene content is generally preferred in the international market. The highest content was recorded by the check, PDW 233 (7.81 ppm) under ITS condition of NWPZ and the zonal mean was 5.45 ppm. Though all the 2<sup>nd</sup> and 1<sup>st</sup> year entries exhibited higher values than the best check, MPO 1215 (5.03 ppm) but only two 1<sup>st</sup> year entries, HD 4728 and HD 4730 had >6.0 ppm content under ITS condition of CZ. The zonal mean was 5.49 ppm. Under RTS condition of CZ, no entry could surpass the best check, HI 8627 (6.47 ppm). In PZ, no entry could exhibit higher content compared to the check, NIDW 295 (6.07 ppm) under ITS condition whereas all the entries recorded higher values than the best check, AKDW 2997-16 (3.71 ppm) and the zonal means were 5.78 ppm and 4.60 ppm respectively.

#### **(viii) Moisture Content (Table 64-66)**

It is an important parameter from storage point of view and grain trading. It depends on the weather conditions at the time of harvesting and also at the time when the determination has been made. Higher moisture content adversely affects the keeping quality of wheat. Also, the protein content values mentioned previously are at 'as is' basis. Hence, moisture content merits consideration if protein is to be calculated on dry basis or any other given moisture content. The threshold value is 12.0%. All the entries in all the zones, centres and sowing conditions fulfilled this requirement.

#### **(ix) $\gamma$ -gliadin (Table 67-69)**

It is an important quality parameter for assessing the quality of pasta products. Durum wheat genotypes with  $\gamma$ -gliadin '45' make good quality pasta products whereas  $\gamma$ -gliadin '42' is negatively related. From this point of view, Indian durums are well placed as all the entries including checks except A-9-30-1 & DDW 30 ( $\gamma$ -gliadin 43.5), MACS 3915 ( $\gamma$ -gliadin 42) and NIDW 295 ( $\gamma$ -gliadin 44) had  $\gamma$ -gliadin 45.

**Table 43: Grain Appearance (Max-10) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timllely Sown</b>							
1. PDW 233 (C)	04	5.5	7.2	6.6	6.3	6.4	<b>6.4</b>
2. PDW 291 (C)	01	6.8	7.5	6.6	6.2	7.6	<b>6.9</b>
3. PDW 314 (C)	05	6.7	7.0	5.8	6.4	6.2	<b>6.4</b>
4. HD 2967 (C) (A)	03	5.8	6.6	6.4	6.2	5.8	<b>6.2</b>
5. HD 4730	02	6.2	7.3	6.0	5.9	7.4	<b>6.6</b>
<b>Mean</b>		<b>6.2</b>	<b>7.1</b>	<b>6.3</b>	<b>6.2</b>	<b>6.7</b>	<b>6.5</b>

**Table 44: Grain Appearance (Max-10) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	6.4	7.8	7.8	6.0	7.8	<b>7.2</b>
2. HI 8737	01	6.9	7.4	7.4	6.5	8.0	<b>7.2</b>
3. HI 8498 (C)	11	6.4	8.0	8.0	6.7	8.2	<b>7.5</b>
4. MPO 1215 (C)	12	6.4	8.1	7.9	6.8	8.4	<b>7.5</b>
5. HI 8750	04	6.5	8.0	7.5	6.0	7.9	<b>7.2</b>
6. HD 4728	08	6.3	7.9	7.7	7.2	8.0	<b>7.4</b>
7. HD 4730	02	5.6	7.2	7.6	7.4	7.7	<b>7.1</b>
<b>Mean</b>		<b>6.4</b>	<b>7.8</b>	<b>7.7</b>	<b>6.7</b>	<b>8.0</b>	<b>7.3</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	7.6	6.2	-	-	-	<b>6.9</b>
2. A 9-30-1 (C)	14	5.7	5.3	-	-	-	<b>5.5</b>
3. HI 8755	09	7.8	6.5	-	-	-	<b>7.2</b>
4. MACS 3916	13	7.5	6.4	-	-	-	<b>7.0</b>
5. MACS 3927	10	7.7	7.4	-	-	-	<b>7.6</b>
6. UAS 451	12	7.6	6.8	-	-	-	<b>7.2</b>
7. DDW 30	05	7.5	6.4	-	-	-	<b>7.0</b>
<b>Mean</b>		<b>7.3</b>	<b>6.4</b>	-	-	-	<b>6.9</b>

**Table 45: Grain Appearance (Max-10) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	8.0	7.8	8.2	<b>8.0</b>
2. UAS 428 (C)	01	8.4	7.8	8.0	<b>8.1</b>
3. HI 8750	03	6.5	7.6	7.9	<b>7.3</b>
4. DDW 27	05	8.2	7.2	8.0	<b>7.8</b>
<b>Mean</b>		<b>7.8</b>	<b>7.6</b>	<b>8.0</b>	<b>7.8</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	8.2	-	<b>8.2</b>
2. AKDW 2997-16 (C)	07	-	8.0	-	<b>8.0</b>
3. HI 8751	03	-	8.6	-	<b>8.6</b>
4. HI 8754	04	-	8.4	-	<b>8.4</b>
5. MACS 3927	08	-	8.2	-	<b>8.2</b>
<b>Mean</b>		-	<b>8.3</b>	-	<b>8.3</b>

**Table 46: Test Weight (kg/hl) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timllely Sown</b>							
1. PDW 233 (C)	04	74.0	82.0	82.0	78.3	78.6	<b>79.0</b>
2. PDW 291 (C)	01	80.6	81.6	81.0	79.5	78.2	<b>80.2</b>
3. PDW 314 (C)	05	80.7	82.0	82.0	81.5	78.6	<b>81.0</b>
4. HD 2967 (C) (A)	03	75.0	78.6	78.0	77.2	79.2	<b>77.6</b>
5. HD 4730	02	79.5	81.2	83.0	79.5	76.6	<b>80.0</b>
<b>Mean</b>		<b>78.0</b>	<b>81.1</b>	<b>81.2</b>	<b>79.2</b>	<b>78.2</b>	<b>79.5</b>

**Table 47: Test Weight (kg/hl) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	84.3	82.4	84.8	83.2	83.2	<b>83.6</b>
2. HI 8737	01	84.3	84.0	84.0	84.0	84.8	<b>84.2</b>
3. HI 8498 (C)	11	84.7	84.2	84.8	84.6	84.2	<b>84.5</b>
4. MPO 1215 (C)	12	84.3	83.3	84.5	84.0	83.0	<b>83.8</b>
5. HI 8750	04	84.2	84.0	84.4	84.2	84.0	<b>84.2</b>
6. HD 4728	08	84.8	83.0	83.5	84.3	82.7	<b>83.7</b>
7. HD 4730	02	83.0	83.0	84.2	84.0	81.6	<b>83.2</b>
<b>Mean</b>		<b>84.2</b>	<b>83.4</b>	<b>84.3</b>	<b>84.0</b>	<b>83.4</b>	<b>83.9</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	83.0	82.2	-	-	-	<b>82.6</b>
2. A 9-30-1 (C)	14	78.5	74.6	-	-	-	<b>76.6</b>
3. HI 8755	09	81.0	82.5	-	-	-	<b>81.8</b>
4. MACS 3916	13	83.4	81.6	-	-	-	<b>82.5</b>
5. MACS 3927	10	81.6	81.3	-	-	-	<b>81.5</b>
6. UAS 451	12	83.3	82.5	-	-	-	<b>82.9</b>
7. DDW 30	05	84.0	82.5	-	-	-	<b>83.3</b>
<b>Mean</b>		<b>82.1</b>	<b>81.0</b>	-	-	-	<b>81.6</b>

**Table 48: Test Weight (kg/hl) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	83.0	80.2	83.2	<b>82.1</b>
2. UAS 428 (C)	01	83.0	80.0	84.0	<b>82.3</b>
3. HI 8750	03	83.4	83.0	84.0	<b>83.5</b>
4. DDW 27	05	84.0	80.0	84.4	<b>82.8</b>
<b>Mean</b>		<b>83.4</b>	<b>80.8</b>	<b>83.9</b>	<b>82.7</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	82.0	-	<b>82.0</b>
2. AKDW 2997-16 (C)	07	-	81.8	-	<b>81.8</b>
3. HI 8751	03	-	80.0	-	<b>80.0</b>
4. HI 8754	04	-	81.4	-	<b>81.4</b>
5. MACS 3927	08	-	82.5	-	<b>82.5</b>
<b>Mean</b>		-	<b>81.5</b>	-	<b>81.5</b>

**Table 49: Protein Content (%) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	11.90	11.32	12.43	10.53	9.70	<b>11.18</b>
2. PDW 291 (C)	01	11.10	12.10	13.30	11.11	9.82	<b>11.49</b>
3. PDW 314 (C)	05	9.60	11.27	11.81	10.12	9.77	<b>10.51</b>
4. HD 2967 (C) (A)	03	10.20	12.15	13.13	12.13	12.05	<b>11.93</b>
5. HD 4730	02	10.33	11.11	12.11	11.20	10.13	<b>10.98</b>
<b>Mean</b>		<b>10.63</b>	<b>11.59</b>	<b>12.56</b>	<b>11.02</b>	<b>10.29</b>	<b>11.22</b>

**Table 50: Protein Content (%) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	10.05	10.81	12.16	10.11	12.41	<b>11.11</b>
2. HI 8737	01	9.23	10.77	12.05	11.43	12.36	<b>11.17</b>
3. HI 8498 (C)	11	10.23	11.91	12.33	11.91	12.53	<b>11.78</b>
4. MPO 1215 (C)	12	9.67	11.97	12.46	11.77	12.31	<b>11.64</b>
5. HI 8750	04	9.43	11.51	11.66	10.71	12.46	<b>11.15</b>
6. HD 4728	08	9.11	11.91	11.23	10.66	11.92	<b>10.97</b>
7. HD 4730	02	9.01	11.88	11.11	10.33	11.67	<b>10.80</b>
<b>Mean</b>		<b>9.53</b>	<b>11.54</b>	<b>11.86</b>	<b>10.99</b>	<b>12.24</b>	<b>11.23</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	13.10	10.67	-	-	-	<b>11.89</b>
2. A 9-30-1 (C)	14	13.31	10.53	-	-	-	<b>11.92</b>
3. HI 8755	09	14.11	11.11	-	-	-	<b>12.61</b>
4. MACS 3916	13	13.41	10.72	-	-	-	<b>12.07</b>
5. MACS 3927	10	12.36	10.95	-	-	-	<b>11.66</b>
6. UAS 451	12	13.41	10.67	-	-	-	<b>12.04</b>
7. DDW 30	05	13.53	10.59	-	-	-	<b>12.06</b>
<b>Mean</b>		<b>13.10</b>	<b>10.67</b>	-	-	-	<b>11.89</b>

**Table 51: Protein Content (%) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	11.61	12.67	11.97	<b>12.08</b>
2. UAS 428 (C)	01	12.05	13.61	11.47	<b>12.38</b>
3. HI 8750	03	11.57	12.77	12.11	<b>12.15</b>
4. DDW 27	05	11.11	12.81	11.23	<b>11.72</b>
<b>Mean</b>		<b>11.59</b>	<b>12.97</b>	<b>11.70</b>	<b>12.08</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	13.56	-	<b>13.56</b>
2. AKDW 2997-16 (C)	07	-	12.11	-	<b>12.11</b>
3. HI 8751	03	-	12.43	-	<b>12.43</b>
4. HI 8754	04	-	12.11	-	<b>12.11</b>
5. MACS 3927	08	-	12.96	-	<b>12.96</b>
<b>Mean</b>		-	<b>13.56</b>	-	<b>13.56</b>

**Table 52: Grain Hardness Index of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	80	50	84	80	65	<b>72</b>
2. PDW 291 (C)	01	85	54	69	80	66	<b>71</b>
3. PDW 314 (C)	05	72	50	72	73	46	<b>63</b>
4. HD 2967 (C) (A)	03	61	51	67	51	48	<b>56</b>
5. HD 4730	02	76	49	89	70	47	<b>66</b>
<b>Mean</b>		<b>75</b>	<b>51</b>	<b>76</b>	<b>71</b>	<b>54</b>	<b>65</b>

**Table 53: Grain Hardness Index of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	50	67	71	60	73	<b>64</b>
2. HI 8737	01	62	69	85	60	76	<b>70</b>
3. HI 8498 (C)	11	67	63	72	67	76	<b>69</b>
4. MPO 1215 (C)	12	54	73	81	76	77	<b>72</b>
5. HI 8750	04	60	75	67	70	77	<b>70</b>
6. HD 4728	08	49	72	67	61	65	<b>63</b>
7. HD 4730	02	52	82	74	68	73	<b>70</b>
<b>Mean</b>		<b>56</b>	<b>72</b>	<b>74</b>	<b>66</b>	<b>74</b>	<b>68</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	74	74	-	-	-	<b>74</b>
2. A 9-30-1 (C)	14	70	65	-	-	-	<b>68</b>
3. HI 8755	09	82	73	-	-	-	<b>78</b>
4. MACS 3916	13	79	85	-	-	-	<b>82</b>
5. MACS 3927	10	62	67	-	-	-	<b>65</b>
6. UAS 451	12	78	75	-	-	-	<b>77</b>
7. DDW 30	05	78	62	-	-	-	<b>70</b>
<b>Mean</b>		<b>75</b>	<b>72</b>	-	-	-	<b>73</b>

**Table 54: Grain Hardness Index of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	79	92	65	<b>79</b>
2. UAS 428 (C)	01	64	99	71	<b>78</b>
3. HI 8750	03	68	85	58	<b>70</b>
4. DDW 27	05	70	97	74	<b>80</b>
<b>Mean</b>		<b>70</b>	<b>93</b>	<b>67</b>	<b>77</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	89	-	<b>89</b>
2. AKDW 2997-16 (C)	07	-	82	-	<b>82</b>
3. HI 8751	03	-	85	-	<b>85</b>
4. HI 8754	04	-	92	-	<b>92</b>
5. MACS 3927	08	-	85	-	<b>85</b>
<b>Mean</b>		-	<b>87</b>	-	<b>87</b>

**Table 55: Sedimentation Value (ml) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	45	34	46	41	38	<b>41</b>
2. PDW 291 (C)	01	34	25	31	35	28	<b>31</b>
3. PDW 314 (C)	05	34	33	37	31	39	<b>35</b>
4. HD 2967 (C) (A)	03	53	53	57	55	59	<b>55</b>
5. HD 4730	02	39	38	40	39	33	<b>38</b>
<b>Mean</b>		<b>41</b>	<b>37</b>	<b>42</b>	<b>40</b>	<b>39</b>	<b>40</b>

**Table 56: Sedimentation Value (ml) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	30	25	35	25	35	<b>30</b>
2. HI 8737	01	26	36	35	32	36	<b>33</b>
3. HI 8498 (C)	11	31	37	30	33	30	<b>32</b>
4. MPO 1215 (C)	12	33	29	38	30	34	<b>33</b>
5. HI 8750	04	28	38	36	29	34	<b>33</b>
6. HD 4728	08	32	29	38	31	37	<b>33</b>
7. HD 4730	02	27	34	32	25	30	<b>30</b>
<b>Mean</b>		<b>30</b>	<b>33</b>	<b>35</b>	<b>29</b>	<b>34</b>	<b>32</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	34	28	-	-	-	<b>31</b>
2. A 9-30-1 (C)	14	30	34	-	-	-	<b>32</b>
3. HI 8755	09	32	29	-	-	-	<b>31</b>
4. MACS 3916	13	31	29	-	-	-	<b>30</b>
5. MACS 3927	10	23	22	-	-	-	<b>23</b>
6. UAS 451	12	35	39	-	-	-	<b>37</b>
7. DDW 30	05	36	42	-	-	-	<b>39</b>
<b>Mean</b>		<b>32</b>	<b>32</b>	-	-	-	<b>32</b>

**Table 57: Sedimentation Value (ml) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	33	30	36	<b>33</b>
2. UAS 428 (C)	01	28	32	36	<b>32</b>
3. HI 8750	03	30	36	37	<b>34</b>
4. DDW 27	05	35	40	44	<b>40</b>
<b>Mean</b>		<b>32</b>	<b>35</b>	<b>38</b>	<b>35</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	38	-	<b>38</b>
2. AKDW 2997-16 (C)	07	-	38	-	<b>38</b>
3. HI 8751	03	-	33	-	<b>33</b>
4. HI 8754	04	-	40	-	<b>40</b>
5. MACS 3927	08	-	28	-	<b>28</b>
<b>Mean</b>		-	<b>35</b>	-	<b>35</b>

**Table 58: Yellow Berry Incidence (%) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	1.2	12.2	2.2	6.2	36.6	<b>11.7</b>
2. PDW 291 (C)	01	9.1	4.2	2.4	23.3	46.3	<b>17.1</b>
3. PDW 314 (C)	05	23.2	22.2	6.3	31.1	39.5	<b>24.5</b>
4. HD 2967 (C) (A)	03	0.0	0.0	1.1	0.0	0.0	<b>0.2</b>
5. HD 4730	02	25.1	30.3	6.2	23.2	85.1	<b>34.0</b>
<b>Mean</b>		<b>11.7</b>	<b>13.8</b>	<b>3.6</b>	<b>16.8</b>	<b>41.5</b>	<b>17.5</b>

**Table 59: Yellow Berry Incidence (%) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	51.1	2.2	2.2	32.2	3.1	<b>18.2</b>
2. HI 8737	01	41.2	6.1	25.3	35.5	3.2	<b>22.3</b>
3. HI 8498 (C)	11	30.3	3.3	24.4	41.1	4.1	<b>20.6</b>
4. MPO 1215 (C)	12	54.4	1.1	1.2	39.2	0.0	<b>19.2</b>
5. HI 8750	04	55.5	8.2	14.4	29.3	2.2	<b>21.9</b>
6. HD 4728	08	65.6	2.4	5.2	21.2	4.2	<b>19.7</b>
7. HD 4730	02	77.7	5.2	8.3	6.3	3.3	<b>20.2</b>
<b>Mean</b>		<b>53.7</b>	<b>4.1</b>	<b>11.6</b>	<b>29.3</b>	<b>2.9</b>	<b>20.3</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	9.1	48.5	-	-	-	<b>28.8</b>
2. A 9-30-1 (C)	14	23.3	66.6	-	-	-	<b>45.0</b>
3. HI 8755	09	4.4	18.8	-	-	-	<b>11.6</b>
4. MACS 3916	13	34.4	31.1	-	-	-	<b>32.8</b>
5. MACS 3927	10	44.4	3.3	-	-	-	<b>23.9</b>
6. UAS 451	12	1.3	7.7	-	-	-	<b>4.5</b>
7. DDW 30	05	6.2	36.6	-	-	-	<b>21.4</b>
<b>Mean</b>		<b>17.6</b>	<b>30.4</b>	-	-	-	<b>24.0</b>

**Table 60: Yellow Berry Incidence (%) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	12.2	14.2	5.1	<b>10.5</b>
2. UAS 428 (C)	01	18.6	5.3	13.3	<b>12.4</b>
3. HI 8750	03	48.3	9.3	5.4	<b>21.0</b>
4. DDW 27	05	41.4	16.2	5.5	<b>21.0</b>
<b>Mean</b>		<b>30.1</b>	<b>11.3</b>	<b>7.3</b>	<b>16.2</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	0.0	-	<b>0.0</b>
2. AKDW 2997-16 (C)	07	-	6.2	-	<b>6.2</b>
3. HI 8751	03	-	0.0	-	<b>0.0</b>
4. HI 8754	04	-	0.0	-	<b>0.0</b>
5. MACS 3927	08	-	1.2	-	<b>1.2</b>
<b>Mean</b>		-	<b>1.5</b>	-	<b>1.5</b>



**Table 61: Yellow Pigment Content (ppm) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	8.06	7.77	7.95	7.86	7.40	<b>7.81</b>
2. PDW 291 (C)	01	5.66	5.46	5.13	5.12	5.73	<b>5.42</b>
3. PDW 314 (C)	05	5.40	4.60	4.62	4.67	5.61	<b>4.98</b>
4. HD 2967 (C) (A)	03	3.99	2.81	2.39	2.81	3.33	<b>3.07</b>
5. HD 4730	02	5.78	5.87	6.25	5.95	5.95	<b>5.96</b>
<b>Mean</b>		<b>5.78</b>	<b>5.30</b>	<b>5.27</b>	<b>5.28</b>	<b>5.60</b>	<b>5.45</b>

**Table 62: Yellow Pigment Content (ppm) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	5.44	4.95	5.41	4.67	5.14	<b>5.12</b>
2. HI 8737	01	5.67	5.26	6.67	5.46	6.17	<b>5.85</b>
3. HI 8498 (C)	11	4.53	4.81	4.22	4.79	4.79	<b>4.63</b>
4. MPO 1215 (C)	12	5.39	4.81	5.27	4.76	4.93	<b>5.03</b>
5. HI 8750	04	5.05	5.68	5.28	5.88	5.82	<b>5.54</b>
6. HD 4728	08	6.18	6.06	5.82	6.06	6.29	<b>6.08</b>
7. HD 4730	02	6.46	5.86	6.24	6.41	6.06	<b>6.21</b>
<b>Mean</b>		<b>5.53</b>	<b>5.35</b>	<b>5.56</b>	<b>5.43</b>	<b>5.60</b>	<b>5.49</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	6.73	6.21	-	-	-	<b>6.47</b>
2. A 9-30-1 (C)	14	3.85	4.13	-	-	-	<b>3.99</b>
3. HI 8755	09	4.55	5.47	-	-	-	<b>5.01</b>
4. MACS 3916	13	4.67	5.55	-	-	-	<b>5.11</b>
5. MACS 3927	10	4.67	5.18	-	-	-	<b>4.93</b>
6. UAS 451	12	5.02	5.44	-	-	-	<b>5.23</b>
7. DDW 30	05	6.06	6.10	-	-	-	<b>6.08</b>
<b>Mean</b>		<b>5.08</b>	<b>5.44</b>	-	-	-	<b>5.26</b>

**Table 63: Yellow Pigment Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	5.54	6.25	6.41	<b>6.07</b>
2. UAS 428 (C)	01	6.08	5.76	6.09	<b>5.98</b>
3. HI 8750	03	4.93	5.25	5.14	<b>5.11</b>
4. DDW 27	05	5.75	6.19	5.97	<b>5.97</b>
<b>Mean</b>		<b>5.58</b>	<b>5.86</b>	<b>5.90</b>	<b>5.78</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	5.40	-	<b>5.40</b>
2. AKDW 2997-16 (C)	07	-	3.71	-	<b>3.71</b>
3. HI 8751	03	-	4.22	-	<b>4.22</b>
4. HI 8754	04	-	4.94	-	<b>4.94</b>
5. MACS 3927	08	-	4.74	-	<b>4.74</b>
<b>Mean</b>		-	<b>4.60</b>	-	<b>4.60</b>

**Table 64: Moisture Content (%) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	9.9	9.0	9.8	10.8	10.1	<b>9.9</b>
2. PDW 291 (C)	01	10.1	8.9	9.8	10.6	10.1	<b>9.9</b>
3. PDW 314 (C)	05	9.8	9.1	12.5	10.8	9.7	<b>10.4</b>
4. HD 2967 (C) (A)	03	9.8	8.5	9.5	10.5	10.4	<b>9.7</b>
5. HD 4730	02	9.8	8.7	9.6	10.7	10.8	<b>9.9</b>
<b>Mean</b>		<b>9.9</b>	<b>8.8</b>	<b>10.2</b>	<b>10.7</b>	<b>10.2</b>	<b>10.0</b>

**Table 65: Moisture Content (%) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	8.4	9.2	9.4	8.4	9.6	<b>9.0</b>
2. HI 8737	01	7.9	9.0	9.5	8.7	9.8	<b>9.0</b>
3. HI 8498 (C)	11	8.4	9.1	9.5	8.7	9.6	<b>9.1</b>
4. MPO 1215 (C)	12	8.1	9.4	9.5	8.9	9.4	<b>9.1</b>
5. HI 8750	04	8.2	9.1	9.3	8.6	9.5	<b>8.9</b>
6. HD 4728	08	8.2	9.1	9.3	8.4	9.4	<b>8.9</b>
7. HD 4730	02	7.9	9.1	9.2	8.5	9.4	<b>8.8</b>
<b>Mean</b>		<b>8.2</b>	<b>9.1</b>	<b>9.4</b>	<b>8.6</b>	<b>9.5</b>	<b>9.0</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	10.0	7.0	-	-	-	<b>8.5</b>
2. A 9-30-1 (C)	14	9.8	8.1	-	-	-	<b>9.0</b>
3. HI 8755	09	10.2	8.5	-	-	-	<b>9.4</b>
4. MACS 3916	13	9.7	8.7	-	-	-	<b>9.2</b>
5. MACS 3927	10	9.8	10.3	-	-	-	<b>10.1</b>
6. UAS 451	12	10.1	8.6	-	-	-	<b>9.4</b>
7. DDW 30	05	10.1	7.2	-	-	-	<b>8.7</b>
<b>Mean</b>		<b>10.0</b>	<b>8.3</b>	-	-	-	<b>9.2</b>

**Table 66: Moisture Content (%) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	9.8	11.2	9.4	<b>10.1</b>
2. UAS 428 (C)	01	10.0	11.7	9.2	<b>10.3</b>
3. HI 8750	03	9.6	11.3	9.2	<b>10.0</b>
4. DDW 27	05	9.8	11.4	9.3	<b>10.2</b>
<b>Mean</b>		<b>9.8</b>	<b>11.4</b>	<b>9.3</b>	<b>10.2</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	10.0	-	<b>10.0</b>
2. AKDW 2997-16 (C)	07	-	10.0	-	<b>10.0</b>
3. HI 8751	03	-	10.1	-	<b>10.1</b>
4. HI 8754	04	-	10.1	-	<b>10.1</b>
5. MACS 3927	08	-	9.9	-	<b>9.9</b>
<b>Mean</b>		-	<b>10.0</b>	-	<b>10.0</b>

**Table 67: Y-gliadin of *T. durum* genotypes in North Western Plains Zone AVT's**

	Variety	Code	Y-gliadin
<b>Irrigated, Timely Sown</b>			
1.	PDW 233 (C)	04	45
2.	PDW 291 (C)	01	45
3.	PDW 314 (C)	05	45
4.	HD 2967 (C) (A)	03	-
5.	HD 4730	02	45

**Table 68 : Y-gliadin of *T. durum* genotypes in Central Zone AVT's**

	Variety	Code	Y-gliadin
<b>Irrigated, Timely Sown</b>			
1.	HI 8736	06	45
2.	HI 8737	01	45
3.	HI 8498 (C)	11	45
4.	MPO 1215 (C)	12	45
5.	HI 8750	04	45
6.	HD 4728	08	45
7.	HD 4730	02	45
<b>Rainfed, Timely Sown</b>			
1.	HI 8627 (C)	06	45
2.	A 9-30-1 (C)	14	43.5
3.	HI 8755	09	45
4.	MACS 3916	13	45
5.	MACS 3927	10	42
6.	UAS 451	12	45
7.	DDW 30	05	43.5

**Table 69: Y-gliadin of *T. durum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Y-gliadin
<b>Irrigated, Timely Sown</b>			
1.	NIDW 295 (C)	06	44
2.	UAS 428 (C)	01	45
3.	HI 8750	03	45
4.	DDW 27	05	45
<b>Rainfed, Timely Sown</b>			
1.	UAS 446	10	45
2.	AKDW 2997-16 (C)	07	45
3.	HI 8751	03	45
4.	HI 8754	04	45
5.	MACS 3927	08	42

# **SECTION B**

## **NATIONAL INITIAL VARIETAL TRIALS**

**i. NIVT 1A**

**ii. NIVT 1B**

**iii. NIVT 2**

**iv. NIVT 3**

**v. NIVT 4**

**vi. NIVT 5A**

**vii. NIVT 5B**

**viii. IVTs from NHZ and SHZ**

## NATIONAL INITIAL VARIETAL TRIALS

All entries received for initial varietal screening in the coordinated trials were examined for some important quality parameters like grain appearance score, grain protein content, sedimentation value, test weight and phenol reaction score. In addition, the durum entries were also evaluated for yellow berry incidence and yellow pigments content. There were seven such multi-zone trials, the results of which are discussed below:

### **NIVT 1A (Irrigated, Timely Sown)**

Samples of 49 entries were received from five locations in the NWPZ and three locations in the NEPZ. Grain appearance score within different locations varied from 5.2 to 5.8 with Pusa and Kanpur recording the highest mean value. The entries DBW 138 and WH 1169 were the best with 6.0 grain appearance score followed by RAJ 4373 and WH 1172 with a score of 5.9. The highest mean test weight value of 79.3kg/hl was recorded at Pusa followed by Kanpur with a value of 78.9kg/hl. The lowest mean test weight value of 72.6kg/hl was observed for the entries grown at Ludhiana. The highest test weight value of 79.8kg/hl was observed for the entry WH 1169. The two more entries UP 2877 and DBW 138 were recorded to have a test weight value of 78.4 and 78.0kg/hl respectively. The protein content as usual was low in the NEPZ with an overall mean protein content of 10.74 compared to 11.77 percent for the NWPZ. The lowest protein content among different locations was recorded at Kanpur (9.10 percent) and highest at Delhi (12.53 percent). The entry UP 2876 was observed to have highest protein content value of 13.22 percent followed by three more entries UP 2877, DBW 136 and UP 2875 with protein content of 12.46, 12.12 and 12.04 percent respectively. There were a large number of entries with a protein content value of 11.00 percent and above. On the whole the sedimentation values varied from 31-47 with a mean value of 41cc. The highest sedimentation mean value of 46cc was recorded at Ludhiana whereas the lowest mean value of 36cc was observed at Kanpur. A number of entries were showing sedimentation values in the range of 35-45cc, desirable for chapatties. The mean phenol reaction score varied from 2.8 to 3.4 over the locations in the two zones. Even the value of zonal or overall mean was observed to be below 4.0 which is quite normal for chapatti dough. The best entries having lowest phenol reaction score were RAJ 4377 (1.8), RAJ 4373 (2.0) and DBW 138 (2.2). In addition twelve more entries were showing phenol reaction score of less than 3.0, considered desirable for chapatties as such dough can be stored for longer and the risk of darkening and nutritional losses is lesser.

**Table 1: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT-1A**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Sabour	Mean	
1	K 0307 (C)	N1A-1	5.0	5.6	5.8	5.7	5.9	<b>5.6</b>	6.4	6.5	5.9	<b>6.3</b>	<b>5.9</b>
2	PBW 708	N1A-2	5.3	5.4	5.8	5.7	5.7	<b>5.6</b>	5.7	6.0	5.9	<b>5.9</b>	<b>5.7</b>
3	HD 2967 (C)	N1A-3	5.3	5.2	5.5	5.6	5.5	<b>5.4</b>	5.4	5.8	5.4	<b>5.5</b>	<b>5.5</b>
4	HD 3153	N1A-4	5.5	5.3	5.5	5.8	5.6	<b>5.5</b>	5.7	5.7	5.7	<b>5.7</b>	<b>5.6</b>
5	DBW 137	N1A-5	4.9	5.4	5.4	5.9	5.9	<b>5.5</b>	5.8	5.8	5.4	<b>5.7</b>	<b>5.6</b>
6	DBW 140	N1A-6	4.5	5.5	5.4	5.5	5.5	<b>5.3</b>	5.7	5.8	5.4	<b>5.6</b>	<b>5.4</b>
7	HD 2733 (C)	N1A-7	4.3	5.6	5.3	5.6	5.1	<b>5.2</b>	5.8	5.9	5.9	<b>5.9</b>	<b>5.4</b>
8	NW 6029	N1A-8	5.2	5.2	5.8	6.0	5.5	<b>5.5</b>	5.9	5.7	5.5	<b>5.7</b>	<b>5.6</b>
9	RAJ 4373	N1A-9	5.3	5.7	6.0	5.7	5.6	<b>5.7</b>	5.5	7.0	6.2	<b>6.2</b>	<b>5.9</b>
10	K 1302	N1A-10	5.4	5.3	5.9	5.4	5.7	<b>5.5</b>	5.9	5.7	5.5	<b>5.7</b>	<b>5.6</b>
11	NW 6036	N1A-11	5.5	5.4	5.4	5.6	5.3	<b>5.4</b>	5.4	5.7	5.3	<b>5.5</b>	<b>5.5</b>
12	JKW 203	N1A-12	5.2	5.2	5.2	5.4	5.4	<b>5.3</b>	5.3	5.6	5.3	<b>5.4</b>	<b>5.3</b>
13	HUW 680	N1A-13	5.9	5.6	6.1	5.7	6.0	<b>5.9</b>	6.2	5.7	5.3	<b>5.7</b>	<b>5.8</b>
14	DBW 139	N1A-14	2.1	5.4	5.9	5.2	5.5	<b>4.8</b>	5.7	5.8	5.2	<b>5.6</b>	<b>5.1</b>
15	HUW 681	N1A-15	5.7	5.4	5.8	5.7	5.6	<b>5.6</b>	5.8	5.8	5.4	<b>5.7</b>	<b>5.7</b>
16	WH 1172	N1A-16	5.8	5.9	5.1	6.2	6.0	<b>5.8</b>	6.5	5.8	5.7	<b>6.0</b>	<b>5.9</b>
17	UP 2873	N1A-17	5.8	5.3	5.8	5.7	5.8	<b>5.7</b>	5.9	6.2	5.6	<b>5.9</b>	<b>5.8</b>
18	BRW 3750	N1A-18	5.5	5.4	5.3	5.8	5.7	<b>5.5</b>	5.7	5.5	5.3	<b>5.5</b>	<b>5.5</b>
19	BRW 3742	N1A-19	4.8	4.9	5.8	5.4	5.4	<b>5.3</b>	5.7	5.6	5.5	<b>5.6</b>	<b>5.4</b>
20	HD 3158	N1A-20	5.7	5.0	5.8	5.7	5.5	<b>5.5</b>	5.7	5.6	5.1	<b>5.5</b>	<b>5.5</b>
21	HD 3151	N1A-21	5.6	5.5	5.6	5.8	5.7	<b>5.6</b>	6.0	5.7	5.5	<b>5.7</b>	<b>5.7</b>
22	UP 2874	N1A-22	2.8	5.3	5.4	5.6	5.6	<b>4.9</b>	5.5	5.9	5.0	<b>5.5</b>	<b>5.1</b>
23	JKW 193	N1A-23	5.3	5.2	5.3	5.4	5.4	<b>5.3</b>	4.0	5.6	4.6	<b>4.7</b>	<b>5.1</b>
24	HD 3156	N1A-24	5.5	5.3	5.9	5.9	5.5	<b>5.6</b>	5.8	5.7	5.1	<b>5.5</b>	<b>5.6</b>
25	PBW 709	N1A-25	5.6	5.0	5.0	5.7	5.1	<b>5.3</b>	5.8	5.5	5.1	<b>5.5</b>	<b>5.4</b>
26	DBW 134	N1A-26	5.6	5.5	5.4	5.8	5.7	<b>5.6</b>	5.9	5.7	5.5	<b>5.7</b>	<b>5.6</b>
27	RAJ 4376	N1A-27	5.9	5.7	5.7	5.9	5.7	<b>5.8</b>	5.6	5.8	5.1	<b>5.5</b>	<b>5.7</b>
28	RAJ 4377	N1A-28	2.6	4.8	5.6	5.5	5.6	<b>4.8</b>	5.5	6.0	5.3	<b>5.6</b>	<b>5.1</b>
29	DBW 138	N1A-29	5.6	5.6	5.5	6.4	5.8	<b>5.8</b>	6.8	6.0	6.0	<b>6.3</b>	<b>6.0</b>
30	WH 1169	N1A-30	5.8	5.5	6.2	6.5	6.2	<b>6.0</b>	6.2	5.8	5.6	<b>5.9</b>	<b>6.0</b>
31	HD 3157	N1A-31	5.5	5.4	5.7	6.0	5.1	<b>5.5</b>	5.9	5.8	5.2	<b>5.6</b>	<b>5.6</b>
32	WH 1168	N1A-32	4.5	5.2	5.6	5.9	5.3	<b>5.3</b>	6.0	5.6	5.6	<b>5.7</b>	<b>5.5</b>
33	WH 1105 (C)	N1A-33	5.6	5.5	5.6	5.3	5.8	<b>5.6</b>	6.0	5.5	5.1	<b>5.5</b>	<b>5.6</b>
34	HD 3155	N1A-34	5.7	5.4	5.8	5.8	5.8	<b>5.7</b>	6.1	6.3	6.1	<b>6.2</b>	<b>5.9</b>
35	RAJ 4375	N1A-35	5.4	5.6	5.7	6.1	5.6	<b>5.7</b>	5.9	5.3	5.5	<b>5.6</b>	<b>5.6</b>
36	RAJ 4374	N1A-36	2.6	5.1	5.8	5.7	5.1	<b>4.9</b>	5.7	5.8	4.9	<b>5.5</b>	<b>5.1</b>
37	DBW 135	N1A-37	5.6	5.2	5.0	5.4	5.3	<b>5.3</b>	5.4	5.4	5.3	<b>5.4</b>	<b>5.3</b>
38	PBW 710	N1A-38	5.5	5.3	5.3	5.7	5.4	<b>5.4</b>	5.7	5.0	5.0	<b>5.2</b>	<b>5.4</b>
39	WH 1170	N1A-39	5.7	5.6	5.9	5.9	5.6	<b>5.7</b>	5.9	5.9	5.5	<b>5.8</b>	<b>5.8</b>
40	HD 3152	N1A-40	5.1	5.4	5.6	5.7	5.8	<b>5.5</b>	5.7	5.7	5.4	<b>5.6</b>	<b>5.6</b>
41	PBW 707	N1A-41	5.6	5.3	5.4	5.4	5.5	<b>5.4</b>	5.7	5.6	5.2	<b>5.5</b>	<b>5.5</b>
42	PBW 711	N1A-42	5.7	5.5	5.7	5.8	5.7	<b>5.7</b>	6.6	5.7	5.5	<b>5.9</b>	<b>5.8</b>
43	HD 3154	N1A-43	5.0	5.4	5.4	6.0	5.5	<b>5.5</b>	5.9	5.6	5.6	<b>5.7</b>	<b>5.6</b>
44	K 1301	N1A-44	5.5	5.5	5.3	5.0	5.8	<b>5.4</b>	5.9	6.0	5.3	<b>5.7</b>	<b>5.5</b>
45	UP 2875	N1A-45	5.6	5.4	5.1	6.0	5.4	<b>5.5</b>	5.8	5.6	5.3	<b>5.6</b>	<b>5.5</b>
46	WH 1171	N1A-46	5.8	5.2	5.9	5.7	5.8	<b>5.7</b>	6.2	5.8	5.8	<b>5.9</b>	<b>5.8</b>
47	UP 2877	N1A-47	5.6	5.4	5.5	5.9	5.9	<b>5.7</b>	5.5	6.0	5.9	<b>5.8</b>	<b>5.7</b>
48	DBW 136	N1A-48	5.9	5.3	5.4	6.2	5.9	<b>5.7</b>	5.6	6.1	6.0	<b>5.9</b>	<b>5.8</b>
49	UP 2876	N1A-49	5.6	5.2	5.4	5.8	5.6	<b>5.5</b>	5.7	6.0	6.1	<b>5.9</b>	<b>5.7</b>
<b>Mean</b>			5.2	5.4	5.6	5.7	5.6	<b>5.5</b>	5.8	5.8	5.5	<b>5.7</b>	<b>5.6</b>

**Table 2: Test weight (kg/ha) of *T.aestivum* genotypes in NIVT-1A**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Sabour	Mean	
1	K 0307 (C)	N1A-1	71.8	74.8	74.8	76.0	78.8	<b>75.2</b>	80.0	80.0	78.5	<b>79.5</b>	<b>76.8</b>
2	PBW 708	N1A-2	74.8	74.0	76.8	75.8	76.5	<b>75.6</b>	79.8	80.5	77.5	<b>79.3</b>	<b>77.0</b>
3	HD 2967 (C)	N1A-3	73.3	73.0	74.8	76.5	77.0	<b>74.9</b>	78.3	78.8	75.3	<b>77.5</b>	<b>75.9</b>
4	HD 3153	N1A-4	75.0	73.0	77.0	77.8	77.3	<b>76.0</b>	79.5	77.8	77.5	<b>78.3</b>	<b>76.9</b>
5	DBW 137	N1A-5	70.5	74.8	75.3	78.0	77.8	<b>75.3</b>	79.5	79.3	76.3	<b>78.4</b>	<b>76.4</b>
6	DBW 140	N1A-6	71.0	75.0	75.3	76.8	75.5	<b>74.7</b>	78.5	78.8	76.3	<b>77.9</b>	<b>75.9</b>
7	HD 2733 (C)	N1A-7	66.5	75.0	74.0	76.8	74.0	<b>73.3</b>	79.8	78.5	76.3	<b>78.2</b>	<b>75.1</b>
8	NW 6029	N1A-8	73.5	74.0	75.3	77.3	75.8	<b>75.2</b>	78.0	78.0	74.3	<b>76.8</b>	<b>75.8</b>
9	RAJ 4373	N1A-9	73.0	76.3	78.0	76.3	76.8	<b>76.1</b>	79.8	80.0	78.3	<b>79.4</b>	<b>77.3</b>
10	K 1302	N1A-10	72.3	74.5	77.5	75.0	77.5	<b>75.4</b>	80.3	80.5	76.5	<b>79.1</b>	<b>76.8</b>
11	NW 6036	N1A-11	73.5	75.3	76.3	77.5	77.0	<b>75.9</b>	79.5	79.0	76.0	<b>78.2</b>	<b>76.8</b>
12	JKW 203	N1A-12	68.0	69.0	69.5	70.8	73.5	<b>70.2</b>	74.3	75.0	71.5	<b>73.6</b>	<b>71.5</b>
13	HUW 680	N1A-13	77.3	75.0	77.5	75.5	79.3	<b>76.9</b>	79.0	78.8	75.5	<b>77.8</b>	<b>77.2</b>
14	DBW 139	N1A-14	52.3	74.3	76.5	73.0	76.0	<b>70.4</b>	79.3	78.5	75.3	<b>77.7</b>	<b>73.2</b>
15	HUW 681	N1A-15	75.3	74.5	76.0	77.3	77.3	<b>76.1</b>	79.5	78.8	76.5	<b>78.3</b>	<b>76.9</b>
16	WH 1172	N1A-16	76.3	77.3	73.0	77.8	78.8	<b>76.6</b>	81.0	80.3	77.8	<b>79.7</b>	<b>77.8</b>
17	UP 2873	N1A-17	75.8	73.8	76.3	76.5	77.3	<b>75.9</b>	79.3	79.0	76.8	<b>78.4</b>	<b>76.9</b>
18	BRW 3750	N1A-18	73.8	73.5	75.3	78.3	76.8	<b>75.5</b>	79.5	79.0	75.3	<b>77.9</b>	<b>76.4</b>
19	BRW 3742	N1A-19	70.8	70.3	77.0	74.8	75.5	<b>73.7</b>	78.8	77.5	75.0	<b>77.1</b>	<b>75.0</b>
20	HD 3158	N1A-20	74.0	74.0	76.0	77.0	74.0	<b>75.0</b>	78.8	78.5	72.8	<b>76.7</b>	<b>75.6</b>
21	HD 3151	N1A-21	74.3	75.0	76.0	77.8	78.8	<b>76.4</b>	80.0	78.3	75.8	<b>78.0</b>	<b>77.0</b>
22	UP 2874	N1A-22	59.8	74.0	74.8	75.5	78.5	<b>72.5</b>	77.0	79.5	74.0	<b>76.8</b>	<b>74.1</b>
23	JKW 193	N1A-23	72.5	75.5	73.8	75.3	75.8	<b>74.6</b>	74.3	79.0	68.3	<b>73.9</b>	<b>74.3</b>
24	HD 3156	N1A-24	73.0	72.8	76.8	77.3	75.5	<b>75.1</b>	78.5	77.3	72.8	<b>76.2</b>	<b>75.5</b>
25	PBW 709	N1A-25	75.0	72.8	76.8	78.0	76.5	<b>75.8</b>	79.3	78.5	75.3	<b>77.7</b>	<b>76.5</b>
26	DBW 134	N1A-26	73.0	73.8	75.8	77.5	76.8	<b>75.4</b>	80.3	78.8	76.8	<b>78.6</b>	<b>76.6</b>
27	RAJ 4376	N1A-27	76.8	75.3	77.0	78.0	77.5	<b>76.9</b>	80.3	79.0	74.8	<b>78.0</b>	<b>77.3</b>
28	RAJ 4377	N1A-28	61.5	71.8	76.3	76.0	75.8	<b>72.3</b>	80.0	79.0	76.5	<b>78.5</b>	<b>74.6</b>
29	DBW 138	N1A-29	75.5	74.3	76.8	79.3	78.0	<b>76.8</b>	80.5	80.5	79.0	<b>80.0</b>	<b>78.0</b>
30	WH 1169	N1A-30	77.8	77.3	79.5	80.8	80.8	<b>79.2</b>	81.8	81.0	79.5	<b>80.8</b>	<b>79.8</b>
31	HD 3157	N1A-31	72.5	74.8	75.8	78.3	74.3	<b>75.1</b>	79.0	78.8	75.3	<b>77.7</b>	<b>76.1</b>
32	WH 1168	N1A-32	68.3	74.8	75.8	78.3	76.5	<b>74.7</b>	79.8	78.3	75.8	<b>78.0</b>	<b>76.0</b>
33	WH 1105 (C)	N1A-33	75.8	75.5	75.3	75.8	78.8	<b>76.2</b>	79.8	78.3	75.0	<b>77.7</b>	<b>76.8</b>
34	HD 3155	N1A-34	75.0	74.5	77.8	77.0	77.5	<b>76.4</b>	80.0	80.5	77.8	<b>79.4</b>	<b>77.5</b>
35	RAJ 4375	N1A-35	75.3	75.8	77.5	79.0	77.3	<b>77.0</b>	80.3	78.8	75.5	<b>78.2</b>	<b>77.4</b>
36	RAJ 4374	N1A-36	64.3	72.8	76.3	77.3	76.5	<b>73.4</b>	78.8	78.8	70.8	<b>76.1</b>	<b>74.5</b>
37	DBW 135	N1A-37	75.3	73.5	73.8	76.3	76.0	<b>75.0</b>	78.3	78.5	76.0	<b>77.6</b>	<b>76.0</b>
38	PBW 710	N1A-38	77.0	75.8	76.0	78.3	77.3	<b>76.9</b>	79.8	77.8	76.0	<b>77.9</b>	<b>77.3</b>
39	WH 1170	N1A-39	74.8	74.8	77.5	76.5	75.8	<b>75.9</b>	80.3	80.8	77.0	<b>79.4</b>	<b>77.2</b>
40	HD 3152	N1A-40	71.5	74.8	76.3	76.8	78.5	<b>75.6</b>	80.3	79.8	78.5	<b>79.5</b>	<b>77.1</b>
41	PBW 707	N1A-41	75.0	74.0	76.0	75.0	76.0	<b>75.2</b>	79.0	78.3	74.0	<b>77.1</b>	<b>75.9</b>
42	PBW 711	N1A-42	76.5	75.5	77.0	78.5	78.8	<b>77.3</b>	81.3	79.0	76.8	<b>79.0</b>	<b>77.9</b>
43	HD 3154	N1A-43	70.5	75.3	76.0	75.8	76.5	<b>74.8</b>	79.3	79.0	76.3	<b>78.2</b>	<b>76.1</b>
44	K 1301	N1A-44	72.8	73.0	74.0	70.5	75.5	<b>73.2</b>	78.3	77.5	72.5	<b>76.1</b>	<b>74.3</b>
45	UP 2875	N1A-45	77.3	75.0	74.5	78.3	78.3	<b>76.7</b>	79.8	80.0	75.3	<b>78.4</b>	<b>77.3</b>
46	WH 1171	N1A-46	76.0	74.5	77.3	76.3	77.5	<b>76.3</b>	78.8	79.3	74.8	<b>77.6</b>	<b>76.8</b>
47	UP 2877	N1A-47	74.0	76.0	78.0	79.3	79.8	<b>77.4</b>	80.3	80.0	80.0	<b>80.1</b>	<b>78.4</b>
48	DBW 136	N1A-48	75.0	74.5	75.5	77.8	77.3	<b>76.0</b>	78.0	77.5	77.5	<b>77.7</b>	<b>76.6</b>
49	UP 2876	N1A-49	74.8	74.0	76.0	77.0	76.5	<b>75.7</b>	79.8	79.8	78.8	<b>79.5</b>	<b>77.1</b>
<b>Mean</b>			<b>72.6</b>	<b>74.3</b>	<b>76.0</b>	<b>76.8</b>	<b>77.0</b>	<b>75.3</b>	<b>79.3</b>	<b>78.9</b>	<b>75.8</b>	<b>78.0</b>	<b>76.3</b>

**Table 3: Protein content (%) of *T.aestivum* genotypes in NIVT-1A**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Sabour	Mean	
1	K 0307 (C)	N1A-1	11.0	10.2	11.9	12.1	11.1	<b>11.3</b>	11.7	9.1	10.2	<b>10.3</b>	<b>10.9</b>
2	PBW 708	N1A-2	11.5	11.3	11.9	12.0	10.3	<b>11.4</b>	11.8	8.9	9.6	<b>10.1</b>	<b>10.9</b>
3	HD 2967 (C)	N1A-3	11.4	11.9	11.6	11.7	10.2	<b>11.4</b>	12.5	8.9	11.5	<b>11.0</b>	<b>11.2</b>
4	HD 3153	N1A-4	11.7	11.1	12.0	11.8	10.0	<b>11.3</b>	12.0	9.0	10.4	<b>10.5</b>	<b>11.0</b>
5	DBW 137	N1A-5	11.9	11.8	12.1	12.2	11.7	<b>11.9</b>	11.8	8.9	10.2	<b>10.3</b>	<b>11.3</b>
6	DBW 140	N1A-6	11.3	10.2	11.3	11.9	11.2	<b>11.2</b>	11.3	8.4	9.9	<b>9.9</b>	<b>10.7</b>
7	HD 2733 (C)	N1A-7	11.1	10.7	11.6	12.6	11.5	<b>11.5</b>	11.8	9.0	11.2	<b>10.7</b>	<b>11.2</b>
8	NW 6029	N1A-8	12.2	11.4	11.6	12.0	10.8	<b>11.6</b>	11.7	9.4	10.5	<b>10.5</b>	<b>11.2</b>
9	RAJ 4373	N1A-9	11.8	10.6	11.5	11.6	10.9	<b>11.3</b>	12.3	9.4	10.9	<b>10.9</b>	<b>11.1</b>
10	K 1302	N1A-10	12.3	10.0	12.0	12.9	11.7	<b>11.8</b>	12.4	8.7	10.6	<b>10.6</b>	<b>11.3</b>
11	NW 6036	N1A-11	12.3	11.5	12.0	14.6	12.0	<b>12.5</b>	12.4	9.4	11.0	<b>10.9</b>	<b>11.9</b>
12	JKW 203	N1A-12	11.6	11.8	12.4	12.4	9.9	<b>11.6</b>	12.5	9.1	10.7	<b>10.8</b>	<b>11.3</b>
13	HUW 680	N1A-13	11.2	10.6	11.4	12.5	10.9	<b>11.3</b>	11.3	8.6	11.0	<b>10.3</b>	<b>10.9</b>
14	DBW 139	N1A-14	13.1	11.7	12.0	12.3	12.0	<b>12.2</b>	12.3	9.1	11.0	<b>10.8</b>	<b>11.7</b>
15	HUW 681	N1A-15	11.4	11.8	12.0	12.4	12.2	<b>12.0</b>	12.0	10.5	10.6	<b>11.0</b>	<b>11.6</b>
16	WH 1172	N1A-16	12.7	10.7	12.7	12.5	11.0	<b>11.9</b>	11.7	9.2	10.5	<b>10.5</b>	<b>11.4</b>
17	UP 2873	N1A-17	11.3	9.7	11.6	12.5	10.5	<b>11.1</b>	12.0	9.0	11.6	<b>10.9</b>	<b>11.0</b>
18	BRW 3750	N1A-18	11.5	10.8	10.7	11.6	10.3	<b>11.0</b>	11.1	8.2	10.5	<b>9.9</b>	<b>10.6</b>
19	BRW 3742	N1A-19	12.2	11.5	11.8	13.8	11.2	<b>12.1</b>	12.0	9.1	12.3	<b>11.1</b>	<b>11.7</b>
20	HD 3158	N1A-20	11.6	11.5	11.7	12.0	11.0	<b>11.6</b>	11.9	8.4	9.9	<b>10.1</b>	<b>11.0</b>
21	HD 3151	N1A-21	11.6	11.4	11.5	11.9	11.0	<b>11.5</b>	11.9	8.9	9.7	<b>10.2</b>	<b>11.0</b>
22	UP 2874	N1A-22	12.8	11.1	12.3	12.9	10.3	<b>11.9</b>	12.6	9.0	12.3	<b>11.3</b>	<b>11.7</b>
23	JKW 193	N1A-23	12.8	11.5	11.4	12.1	11.1	<b>11.8</b>	12.3	8.6	11.8	<b>10.9</b>	<b>11.5</b>
24	HD 3156	N1A-24	12.4	11.8	11.8	12.7	10.5	<b>11.8</b>	12.6	8.9	11.7	<b>11.1</b>	<b>11.6</b>
25	PBW 709	N1A-25	11.4	12.6	12.2	12.4	10.8	<b>11.9</b>	11.6	9.7	11.1	<b>10.8</b>	<b>11.5</b>
26	DBW 134	N1A-26	13.1	10.9	11.7	13.7	12.2	<b>12.3</b>	12.7	9.1	11.1	<b>11.0</b>	<b>11.8</b>
27	RAJ 4376	N1A-27	11.7	12.4	12.5	12.6	12.1	<b>12.3</b>	12.1	9.0	12.1	<b>11.1</b>	<b>11.8</b>
28	RAJ 4377	N1A-28	11.8	11.5	12.1	12.3	11.3	<b>11.8</b>	12.2	8.9	11.9	<b>11.0</b>	<b>11.5</b>
29	DBW 138	N1A-29	13.3	11.9	12.4	12.7	10.9	<b>12.2</b>	12.8	9.6	10.3	<b>10.9</b>	<b>11.7</b>
30	WH 1169	N1A-30	12.9	11.4	11.7	12.1	10.9	<b>11.8</b>	12.6	9.0	10.4	<b>10.7</b>	<b>11.4</b>
31	HD 3157	N1A-31	12.1	10.0	10.9	11.9	11.1	<b>11.2</b>	11.5	9.3	11.2	<b>10.7</b>	<b>11.0</b>
32	WH 1168	N1A-32	12.4	11.2	12.2	12.7	11.8	<b>12.1</b>	11.6	9.0	11.3	<b>10.6</b>	<b>11.5</b>
33	WH 1105 (C)	N1A-33	11.7	11.3	11.9	12.4	10.9	<b>11.6</b>	11.4	8.7	10.9	<b>10.3</b>	<b>11.2</b>
34	HD 3155	N1A-34	12.7	12.3	12.0	13.3	10.3	<b>12.1</b>	12.6	9.7	11.1	<b>11.1</b>	<b>11.8</b>
35	RAJ 4375	N1A-35	13.4	11.8	12.2	13.4	11.0	<b>12.4</b>	12.1	9.1	11.9	<b>11.0</b>	<b>11.9</b>
36	RAJ 4374	N1A-36	11.2	10.6	10.8	11.8	10.1	<b>10.9</b>	11.2	9.1	10.8	<b>10.4</b>	<b>10.7</b>
37	DBW 135	N1A-37	12.7	12.0	11.5	12.4	9.3	<b>11.6</b>	12.2	8.4	10.9	<b>10.5</b>	<b>11.2</b>
38	PBW 710	N1A-38	11.3	11.5	11.8	12.1	11.2	<b>11.6</b>	12.6	8.8	10.7	<b>10.7</b>	<b>11.3</b>
39	WH 1170	N1A-39	13.0	10.9	11.9	12.4	12.9	<b>12.2</b>	11.9	9.4	10.5	<b>10.6</b>	<b>11.6</b>
40	HD 3152	N1A-40	12.2	11.8	11.9	12.8	11.6	<b>12.1</b>	12.2	9.9	11.2	<b>11.1</b>	<b>11.7</b>
41	PBW 707	N1A-41	11.5	10.3	10.3	11.6	10.3	<b>10.8</b>	10.9	8.7	10.3	<b>10.0</b>	<b>10.5</b>
42	PBW 711	N1A-42	12.4	10.3	12.0	12.4	11.1	<b>11.6</b>	12.1	8.4	10.8	<b>10.4</b>	<b>11.2</b>
43	HD 3154	N1A-43	11.7	10.2	11.7	12.2	11.2	<b>11.4</b>	11.5	7.9	10.5	<b>10.0</b>	<b>10.9</b>
44	K 1301	N1A-44	11.9	11.5	12.7	14.0	9.8	<b>12.0</b>	11.9	8.6	11.8	<b>10.8</b>	<b>11.5</b>
45	UP 2875	N1A-45	12.0	10.8	13.3	13.9	10.9	<b>12.2</b>	12.8	10.2	12.4	<b>11.8</b>	<b>12.0</b>
46	WH 1171	N1A-46	11.7	11.5	10.9	11.9	11.2	<b>11.4</b>	11.5	8.1	10.7	<b>10.1</b>	<b>10.9</b>
47	UP 2877	N1A-47	11.9	11.7	13.4	13.3	12.5	<b>12.6</b>	13.6	10.8	12.5	<b>12.3</b>	<b>12.5</b>
48	DBW 136	N1A-48	12.4	12.3	13.4	12.9	11.1	<b>12.4</b>	13.6	9.9	11.5	<b>11.7</b>	<b>12.1</b>
49	UP 2876	N1A-49	13.9	13.7	12.9	13.9	14.0	<b>13.7</b>	13.7	10.9	12.8	<b>12.5</b>	<b>13.2</b>
<b>Mean</b>			<b>12.1</b>	<b>11.3</b>	<b>11.9</b>	<b>12.5</b>	<b>11.1</b>	<b>11.8</b>	<b>12.1</b>	<b>9.1</b>	<b>11.0</b>	<b>10.7</b>	<b>11.4</b>



**Table 4: Sedimentation value (ml) of *T.aestivum* genotypes in NIVT-1A**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Sabour	Mean	
1	K 0307 (C)	N1A-1	30	28	34	32	32	31	39	28	30	32	32
2	PBW 708	N1A-2	49	45	46	43	39	44	40	45	41	42	44
3	HD 2967 (C)	N1A-3	52	49	47	45	47	48	35	40	47	41	45
4	HD 3153	N1A-4	41	37	41	40	35	39	40	33	36	36	38
5	DBW 137	N1A-5	45	41	41	40	41	42	32	35	42	36	40
6	DBW 140	N1A-6	44	45	41	38	43	42	32	37	41	37	40
7	HD 2733 (C)	N1A-7	39	36	34	33	35	35	34	38	40	37	36
8	NW 6029	N1A-8	46	45	38	39	42	42	41	42	45	43	42
9	RAJ 4373	N1A-9	46	33	36	36	37	38	34	31	41	35	37
10	K 1302	N1A-10	48	44	43	42	45	44	43	37	44	41	43
11	NW 6036	N1A-11	46	37	47	35	43	42	43	37	42	41	41
12	JKW 203	N1A-12	47	40	43	42	43	43	43	36	43	41	42
13	HUW 680	N1A-13	52	45	40	50	41	46	45	40	44	43	45
14	DBW 139	N1A-14	43	33	36	37	33	36	39	33	35	36	36
15	HUW 681	N1A-15	52	44	39	51	44	46	36	43	43	41	44
16	WH 1172	N1A-16	53	41	44	47	41	45	45	37	42	41	44
17	UP 2873	N1A-17	44	30	43	43	36	39	35	27	39	34	37
18	BRW 3750	N1A-18	47	39	41	39	40	41	38	36	41	38	40
19	BRW 3742	N1A-19	42	33	42	37	31	37	49	30	34	38	37
20	HD 3158	N1A-20	44	40	41	39	41	41	43	30	40	38	40
21	HD 3151	N1A-21	49	40	47	49	44	46	35	39	48	41	44
22	UP 2874	N1A-22	42	32	37	37	34	36	42	30	42	38	37
23	JKW 193	N1A-23	47	37	43	41	39	41	38	40	47	42	42
24	HD 3156	N1A-24	49	47	52	52	42	48	40	41	49	43	47
25	PBW 709	N1A-25	50	42	49	47	42	46	47	40	48	45	46
26	DBW 134	N1A-26	50	41	50	49	44	47	46	40	45	44	46
27	RAJ 4376	N1A-27	53	45	45	52	44	48	50	40	52	47	48
28	RAJ 4377	N1A-28	39	36	43	49	38	41	35	38	41	38	40
29	DBW 138	N1A-29	43	37	38	36	37	38	44	37	42	41	39
30	WH 1169	N1A-30	46	37	40	41	39	41	42	40	43	42	41
31	HD 3157	N1A-31	50	35	38	41	38	40	49	40	47	45	42
32	WH 1168	N1A-32	39	33	39	34	36	36	40	32	41	38	37
33	WH 1105 (C)	N1A-33	48	49	47	49	37	46	43	37	47	42	45
34	HD 3155	N1A-34	44	38	46	41	43	42	38	38	45	40	42
35	RAJ 4375	N1A-35	51	49	46	43	49	48	45	39	50	45	47
36	RAJ 4374	N1A-36	45	34	39	42	36	39	35	45	39	40	39
37	DBW 135	N1A-37	53	40	47	50	42	46	33	37	53	41	44
38	PBW 710	N1A-38	44	36	36	42	37	39	41	38	41	40	39
39	WH 1170	N1A-39	46	38	42	42	43	42	43	38	46	42	42
40	HD 3152	N1A-40	42	33	42	39	34	38	44	34	43	40	39
41	PBW 707	N1A-41	44	31	37	38	37	37	42	30	39	37	37
42	PBW 711	N1A-42	47	31	44	38	35	39	44	35	41	40	39
43	HD 3154	N1A-43	49	40	47	46	37	44	37	33	46	39	42
44	K 1301	N1A-44	54	46	46	40	42	46	41	39	51	44	45
45	UP 2875	N1A-45	43	34	39	35	36	37	40	38	36	38	38
46	WH 1171	N1A-46	48	39	45	45	39	43	36	42	47	42	43
47	UP 2877	N1A-47	44	33	38	34	41	38	49	36	40	42	39
48	DBW 136	N1A-48	45	37	38	36	38	39	47	34	40	40	39
49	UP 2876	N1A-49	47	39	40	40	42	42	48	35	43	42	42
<b>Mean</b>			<b>46</b>	<b>39</b>	<b>42</b>	<b>42</b>	<b>39</b>	<b>42</b>	<b>41</b>	<b>37</b>	<b>43</b>	<b>40</b>	<b>41</b>

**Table 5: Phenol reaction score (Max-10) of *T.aestivum* genotypes in NIVT-1A**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Sabour	Mean	
1	K 0307 (C)	N1A-1	3.7	3.2	3.4	3.5	3.3	<b>3.4</b>	3.9	3.2	3.4	<b>3.5</b>	<b>3.5</b>
2	PBW 708	N1A-2	3.5	3.3	3.8	3.7	3.2	<b>3.5</b>	4.0	3.2	3.6	<b>3.6</b>	<b>3.5</b>
3	HD 2967 (C)	N1A-3	3.7	3.2	3.6	3.7	3.2	<b>3.5</b>	3.2	3.6	3.5	<b>3.4</b>	<b>3.5</b>
4	HD 3153	N1A-4	3.7	3.0	3.4	3.5	3.4	<b>3.4</b>	3.1	3.1	3.7	<b>3.3</b>	<b>3.4</b>
5	DBW 137	N1A-5	3.4	3.0	3.3	3.7	3.3	<b>3.3</b>	4.0	3.3	3.4	<b>3.6</b>	<b>3.4</b>
6	DBW 140	N1A-6	3.3	2.9	3.4	3.8	3.3	<b>3.3</b>	4.2	3.5	3.1	<b>3.6</b>	<b>3.4</b>
7	HD 2733 (C)	N1A-7	3.3	3.9	3.3	3.5	3.1	<b>3.4</b>	3.3	3.3	3.6	<b>3.4</b>	<b>3.4</b>
8	NW 6029	N1A-8	4.0	3.0	3.5	1.8	3.0	<b>3.1</b>	3.2	3.9	3.8	<b>3.6</b>	<b>3.3</b>
9	RAJ 4373	N1A-9	1.2	1.5	1.6	2.6	2.2	<b>1.8</b>	2.0	2.6	2.4	<b>2.3</b>	<b>2.0</b>
10	K 1302	N1A-10	2.6	1.8	1.8	3.8	2.9	<b>2.6</b>	3.2	2.9	2.8	<b>3.0</b>	<b>2.7</b>
11	NW 6036	N1A-11	3.0	3.4	3.9	3.0	3.6	<b>3.4</b>	3.4	4.0	3.6	<b>3.7</b>	<b>3.5</b>
12	JKW 203	N1A-12	3.2	3.6	3.4	3.8	3.1	<b>3.4</b>	3.8	3.5	3.4	<b>3.6</b>	<b>3.5</b>
13	HUW 680	N1A-13	3.1	3.3	3.0	3.4	3.2	<b>3.2</b>	3.7	3.8	3.7	<b>3.7</b>	<b>3.4</b>
14	DBW 139	N1A-14	4.0	3.6	3.3	3.4	3.2	<b>3.5</b>	3.8	4.4	3.8	<b>4.0</b>	<b>3.7</b>
15	HUW 681	N1A-15	3.2	3.3	3.7	3.0	3.4	<b>3.3</b>	3.9	3.9	4.7	<b>4.2</b>	<b>3.6</b>
16	WH 1172	N1A-16	3.0	3.4	2.0	3.6	3.0	<b>3.0</b>	3.4	3.2	3.8	<b>3.5</b>	<b>3.2</b>
17	UP 2873	N1A-17	3.2	3.3	3.4	2.8	3.7	<b>3.3</b>	3.8	3.6	3.6	<b>3.7</b>	<b>3.4</b>
18	BRW 3750	N1A-18	1.1	2.4	2.6	2.4	3.2	<b>2.3</b>	1.8	2.8	2.8	<b>2.5</b>	<b>2.4</b>
19	BRW 3742	N1A-19	1.0	2.7	3.6	3.4	2.5	<b>2.6</b>	2.6	1.9	2.5	<b>2.3</b>	<b>2.5</b>
20	HD 3158	N1A-20	3.5	2.2	3.9	3.2	3.6	<b>3.3</b>	3.6	3.5	3.7	<b>3.6</b>	<b>3.4</b>
21	HD 3151	N1A-21	3.5	3.8	4.3	3.0	3.8	<b>3.7</b>	4.5	3.4	3.9	<b>3.9</b>	<b>3.8</b>
22	UP 2874	N1A-22	4.1	3.0	4.0	3.4	3.4	<b>3.6</b>	3.6	3.4	4.0	<b>3.7</b>	<b>3.6</b>
23	JKW 193	N1A-23	3.0	2.9	3.6	1.8	3.1	<b>2.9</b>	3.4	3.7	3.9	<b>3.7</b>	<b>3.2</b>
24	HD 3156	N1A-24	1.6	2.7	2.7	4.2	2.6	<b>2.8</b>	3.5	2.8	2.9	<b>3.1</b>	<b>2.9</b>
25	PBW 709	N1A-25	3.2	4.0	3.9	2.2	2.9	<b>3.2</b>	3.6	3.8	4.0	<b>3.8</b>	<b>3.5</b>
26	DBW 134	N1A-26	1.3	2.7	2.4	2.9	2.2	<b>2.3</b>	2.6	2.5	2.1	<b>2.4</b>	<b>2.3</b>
27	RAJ 4376	N1A-27	1.6	1.8	2.0	2.6	2.2	<b>2.0</b>	2.4	2.7	2.7	<b>2.6</b>	<b>2.3</b>
28	RAJ 4377	N1A-28	1.6	1.8	1.8	2.0	1.2	<b>1.7</b>	1.0	2.5	2.4	<b>2.0</b>	<b>1.8</b>
29	DBW 138	N1A-29	1.0	2.0	1.9	3.8	1.4	<b>2.0</b>	2.4	2.6	2.9	<b>2.6</b>	<b>2.3</b>
30	WH 1169	N1A-30	2.9	3.8	3.7	4.0	3.1	<b>3.5</b>	3.3	3.2	3.8	<b>3.4</b>	<b>3.5</b>
31	HD 3157	N1A-31	3.1	3.8	3.6	4.6	3.5	<b>3.7</b>	3.5	3.9	3.7	<b>3.7</b>	<b>3.7</b>
32	WH 1168	N1A-32	3.4	3.0	3.8	4.6	3.4	<b>3.6</b>	3.8	3.9	3.6	<b>3.8</b>	<b>3.7</b>
33	WH 1105 (C)	N1A-33	3.8	3.1	3.9	4.4	2.0	<b>3.4</b>	3.6	4.8	3.9	<b>4.1</b>	<b>3.7</b>
34	HD 3155	N1A-34	1.7	2.2	2.0	2.2	3.7	<b>2.4</b>	2.2	2.6	2.7	<b>2.5</b>	<b>2.4</b>
35	RAJ 4375	N1A-35	2.2	2.0	1.9	1.8	2.5	<b>2.1</b>	3.0	2.3	2.9	<b>2.7</b>	<b>2.3</b>
36	RAJ 4374	N1A-36	1.2	2.5	1.8	2.7	2.7	<b>2.2</b>	1.6	2.5	3.0	<b>2.4</b>	<b>2.3</b>
37	DBW 135	N1A-37	3.6	3.2	3.7	4.3	3.5	<b>3.7</b>	3.2	4.4	4.0	<b>3.9</b>	<b>3.7</b>
38	PBW 710	N1A-38	3.5	3.3	4.4	3.9	3.0	<b>3.6</b>	3.7	4.1	4.2	<b>4.0</b>	<b>3.8</b>
39	WH 1170	N1A-39	1.8	2.4	2.6	2.5	2.7	<b>2.4</b>	1.2	2.5	2.9	<b>2.2</b>	<b>2.3</b>
40	HD 3152	N1A-40	3.4	2.9	4.1	4.5	3.6	<b>3.7</b>	3.9	3.9	3.6	<b>3.8</b>	<b>3.7</b>
41	PBW 707	N1A-41	3.5	3.0	4.4	4.4	3.4	<b>3.7</b>	3.2	3.9	3.5	<b>3.5</b>	<b>3.7</b>
42	PBW 711	N1A-42	3.5	3.3	3.6	3.8	3.2	<b>3.5</b>	3.8	3.6	3.5	<b>3.6</b>	<b>3.5</b>
43	HD 3154	N1A-43	3.5	3.2	4.4	3.6	3.1	<b>3.6</b>	3.6	4.1	3.8	<b>3.8</b>	<b>3.7</b>
44	K 1301	N1A-44	1.7	2.8	2.0	2.4	2.6	<b>2.3</b>	2.9	2.9	2.2	<b>2.7</b>	<b>2.4</b>
45	UP 2875	N1A-45	2.0	2.6	1.8	2.9	2.4	<b>2.3</b>	1.4	2.8	2.8	<b>2.3</b>	<b>2.3</b>
46	WH 1171	N1A-46	2.8	2.9	3.8	3.9	3.3	<b>3.3</b>	3.6	3.8	3.3	<b>3.6</b>	<b>3.4</b>
47	UP 2877	N1A-47	3.2	3.0	3.2	3.8	2.9	<b>3.2</b>	3.2	4.2	3.4	<b>3.6</b>	<b>3.4</b>
48	DBW 136	N1A-48	3.1	3.2	3.5	3.3	3.0	<b>3.2</b>	3.7	3.7	3.9	<b>3.8</b>	<b>3.4</b>
49	UP 2876	N1A-49	4.0	3.4	3.3	3.6	3.1	<b>3.5</b>	2.8	3.8	3.3	<b>3.3</b>	<b>3.4</b>
<b>Mean</b>			<b>2.8</b>	<b>2.9</b>	<b>3.2</b>	<b>3.3</b>	<b>3.0</b>	<b>3.1</b>	<b>3.2</b>	<b>3.4</b>	<b>3.4</b>	<b>3.3</b>	<b>3.2</b>

## **NIVT 1B (Irrigated Timely Sown)**

Grain samples of 49 genotypes were received from five locations of NWPZ and three sites of NEPZ. Both the regions registered no difference in grain appearance score (7.1) and sedimentation value (36ml). NWPZ had better grain protein (12.4%) in comparison to NEPZ (11.0%) but test weight in NWPZ (74.6kg/hl) was lower than the adjoining NEPZ (77.6kg/hl). Grain appearance score varied between 6.6 to 7.7 in NWPZ and 6.2 to 7.9 in NEPZ and the best entries NW 6028 (7.7) in NWPZ and HP 1957 (7.9) in NEPZ were much better than the zonal checks. Durgapura location of NWPZ and Kanpur of NEPZ had well developed grains with GAS 7.9. Test weight in NWPZ varied between 70.2 to 78.2 kg/hl among the test entries. Best genotype in this region was BRW 3748 and best site mean was recorded at Delhi (77.1 kg/hl). Test weight at Ludhiana was very low (70kg/hl). In NEPZ, test weight range amongst genotypes was 72.7 to 79.5 kg/hl and the best entry was again BRW 3748. Kanpur and Samastipur locations registered better test weight (78.7kg/hl) in comparison to Sabour (75.3 kg/hl). Grain protein content in NWPZ was high (13%) at Hisar, Delhi and poor at Pantnagar (11.4%). Site differences could be observed in NEPZ also as there were wide difference between Sabour (12.2%) and Kanpur (9.5%). In comparison to check HD 2967 (12.8%), promising entries in NWPZ were HUW 686, WH 1174, HD 3161 K 1307 and RAJ 4380 with protein 13.4-13.5% protein levels. Several entries outscored best check HD 1733 (10.8%) in NEPZ also like RAJ 4380 (13.3%) & WH 1174 (12.7%). Site differences were large in sedimentation value but tremendous variability existed in test entries in NWPZ (26-46ml) and NEPZ (24-46ml). NW 6031 excelled in both the zones with sedimentation value 46ml and was the only genotype better than check WH 1105 (44ml).

**Table 6: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT-1B**

Sr. No	Variety	Trial Code	NWPZ						NEPZ				Overall Mean
			Durgapura	Hisar	Ludhiana	Delhi	Pantnagar	Mean	Kanpur	Samastipur	Sabour	Mean	
1	BRW 3748	N-1B-01	7.7	7.1	6.3	7.1	7.0	<b>7.0</b>	6.5	8.5	6.8	<b>7.3</b>	<b>7.1</b>
2	DBW 143	N-1B-02	7.4	6.8	7.1	6.6	6.8	<b>6.9</b>	6.0	7.7	6.3	<b>6.7</b>	<b>6.8</b>
3	HUW 686	N-1B-03	7.8	6.8	6.8	6.2	7.1	<b>6.9</b>	6.1	8.1	6.5	<b>6.9</b>	<b>6.9</b>
4	DBW 145	N-1B-04	7.6	6.7	6.5	6.2	7.4	<b>6.9</b>	6.1	8.2	6.5	<b>6.9</b>	<b>6.9</b>
5	HUW 685	N-1B-05	8.0	6.5	6.3	6.1	7.0	<b>6.8</b>	5.8	7.3	6.1	<b>6.4</b>	<b>6.6</b>
6	WH 1173	N-1B-06	8.1	6.6	7.4	6.5	7.6	<b>7.2</b>	6.7	8.2	6.2	<b>7.0</b>	<b>7.2</b>
7	HD 2733 (C)	N-1B-07	8.1	6.9	5.8	7.2	7.2	<b>7.0</b>	6.9	8.3	6.8	<b>7.3</b>	<b>7.2</b>
8	HD 3159	N-1B-08	8.0	7.0	7.3	6.4	7.0	<b>7.1</b>	5.5	7.8	6.5	<b>6.6</b>	<b>6.9</b>
9	HD 3162	N-1B-09	7.9	7.0	6.4	7.5	7.8	<b>7.3</b>	7.1	8.3	6.7	<b>7.4</b>	<b>7.3</b>
10	NW 6025	N-1B-10	7.5	7.0	5.3	7.4	7.4	<b>6.9</b>	6.2	8.3	6.3	<b>6.9</b>	<b>6.9</b>
11	NW 6023	N-1B-11	7.5	7.2	7.5	6.9	7.5	<b>7.3</b>	6.3	8.0	6.7	<b>7.0</b>	<b>7.2</b>
12	K 1306	N-1B-12	7.9	7.0	7.1	6.3	7.2	<b>7.1</b>	6.5	8.3	6.4	<b>7.1</b>	<b>7.1</b>
13	PBW 714	N-1B-13	8.0	6.9	7.0	6.4	6.9	<b>7.0</b>	6.7	8.1	6.2	<b>7.0</b>	<b>7.0</b>
14	HD 3160	N-1B-14	8.1	6.7	7.3	7.0	7.2	<b>7.3</b>	6.6	7.9	6.0	<b>6.8</b>	<b>7.1</b>
15	PBW 712	N-1B-15	7.7	6.7	7.0	7.0	7.0	<b>7.1</b>	5.9	7.9	6.1	<b>6.6</b>	<b>6.9</b>
16	UP 2878	N-1B-16	7.9	6.7	5.6	6.4	7.4	<b>6.8</b>	7.7	8.2	6.5	<b>7.5</b>	<b>7.1</b>
17	WH 1175	N-1B-17	8.1	6.7	6.4	7.5	7.3	<b>7.2</b>	6.1	8.1	6.4	<b>6.9</b>	<b>7.1</b>
18	UP 2879	N-1B-18	7.3	7.1	4.5	6.3	7.3	<b>6.5</b>	7.1	8.4	6.0	<b>7.2</b>	<b>6.8</b>
19	NW 6033	N-1B-19	7.5	6.3	5.2	6.4	7.2	<b>6.5</b>	6.4	8.1	6.8	<b>7.1</b>	<b>6.7</b>
20	BRW 3743	N-1B-20	8.3	7.2	7.1	7.8	7.2	<b>7.5</b>	5.8	8.2	6.7	<b>6.9</b>	<b>7.3</b>
21	DBW 144	N-1B-21	7.9	7.1	6.7	7.0	7.1	<b>7.2</b>	7.6	6.7	6.7	<b>7.0</b>	<b>7.1</b>
22	DBW 141	N-1B-22	8.0	7.3	7.2	7.5	7.2	<b>7.4</b>	7.2	6.4	6.3	<b>6.6</b>	<b>7.1</b>
23	DBW 142	N-1B-23	8.0	7.0	5.3	7.6	6.9	<b>7.0</b>	6.2	6.0	6.5	<b>6.2</b>	<b>6.7</b>
24	HD 2967 (C)	N-1B-24	8.1	7.0	6.9	7.1	7.1	<b>7.2</b>	6.1	6.8	6.3	<b>6.4</b>	<b>6.9</b>
25	NW 6031	N-1B-25	8.2	7.3	6.5	6.8	7.1	<b>7.2</b>	6.9	6.7	6.4	<b>6.7</b>	<b>7.0</b>
26	WH 1174	N-1B-26	8.1	6.7	6.8	7.1	7.2	<b>7.2</b>	6.5	7.6	6.2	<b>6.8</b>	<b>7.0</b>
27	KDW 2010	N-1B-27	8.3	7.5	5.9	6.9	7.2	<b>7.2</b>	5.7	8.3	6.0	<b>6.7</b>	<b>7.0</b>
28	Ankur BW 249	N-1B-28	8.3	7.3	5.8	7.7	7.3	<b>7.3</b>	6.1	8.2	7.4	<b>7.2</b>	<b>7.3</b>
29	BRW 3747	N-1B-29	7.7	7.2	7.1	7.3	6.9	<b>7.2</b>	6.8	8.1	7.4	<b>7.4</b>	<b>7.3</b>
30	K 1305	N-1B-30	8.0	7.0	7.2	7.5	7.2	<b>7.4</b>	7.4	8.2	7.0	<b>7.5</b>	<b>7.4</b>
31	K 1304	N-1B-31	7.7	6.5	6.6	6.4	7.6	<b>7.0</b>	7.1	8.1	7.4	<b>7.5</b>	<b>7.2</b>
32	PBW 713	N-1B-32	8.3	7.2	7.3	6.8	7.2	<b>7.4</b>	7.1	8.0	7.2	<b>7.4</b>	<b>7.4</b>
33	HUW 682	N-1B-33	8.0	7.8	5.5	6.7	7.0	<b>7.0</b>	7.0	8.0	6.5	<b>7.2</b>	<b>7.1</b>
34	HD 3161	N-1B-34	7.6	7.2	6.1	6.5	7.8	<b>7.0</b>	7.4	7.7	6.4	<b>7.2</b>	<b>7.1</b>
35	UP 2880	N-1B-35	8.4	7.6	5.9	6.3	7.4	<b>7.1</b>	7.2	8.0	7.1	<b>7.4</b>	<b>7.2</b>
36	K 1307	N-1B-36	8.0	7.3	6.0	7.1	7.2	<b>7.1</b>	7.3	8.2	6.8	<b>7.4</b>	<b>7.2</b>
37	HP 1956	N-1B-37	7.3	7.1	5.5	7.1	7.4	<b>6.9</b>	7.4	7.9	6.8	<b>7.4</b>	<b>7.1</b>
38	RAJ 4379	N-1B-38	7.4	6.7	7.1	6.6	7.4	<b>7.0</b>	6.7	7.3	6.7	<b>6.9</b>	<b>7.0</b>
39	NW 6028	N-1B-39	8.1	7.8	8.1	7.1	7.4	<b>7.7</b>	6.7	8.3	6.7	<b>7.2</b>	<b>7.5</b>
40	RAJ 4378	N-1B-40	8.2	7.2	7.2	6.9	7.4	<b>7.4</b>	7.5	8.1	7.3	<b>7.6</b>	<b>7.5</b>
41	K 0307 (C)	N-1B-41	7.8	6.6	6.8	7.1	7.3	<b>7.1</b>	7.1	8.1	7.3	<b>7.5</b>	<b>7.3</b>
42	HUW 684	N-1B-42	8.0	7.0	7.1	6.4	7.0	<b>7.1</b>	6.5	7.8	6.2	<b>6.8</b>	<b>7.0</b>
43	K 1308	N-1B-43	7.7	6.6	5.6	6.1	7.2	<b>6.6</b>	6.1	7.9	7.0	<b>7.0</b>	<b>6.8</b>
44	HI 1606	N-1B-44	7.6	6.5	6.2	6.4	7.0	<b>6.7</b>	6.5	8.1	7.3	<b>7.3</b>	<b>7.0</b>
45	HI 1599	N-1B-45	8.2	7.1	5.5	7.2	7.0	<b>7.0</b>	7.0	8.3	7.3	<b>7.5</b>	<b>7.2</b>
46	HP 1957	N-1B-46	8.1	7.4	6.2	7.8	7.6	<b>7.4</b>	7.8	8.2	7.6	<b>7.9</b>	<b>7.6</b>
47	HUW 683	N-1B-47	8.4	7.8	6.6	7.9	7.4	<b>7.6</b>	6.5	8.3	7.7	<b>7.5</b>	<b>7.6</b>
48	RAJ 4380	N-1B-48	8.1	6.2	6.0	6.0	7.0	<b>6.7</b>	7.1	6.6	6.7	<b>6.8</b>	<b>6.7</b>
49	WH 1105 (C)	N-1B-49	8.4	7.6	7.6	7.4	7.3	<b>7.7</b>	7.5	7.5	6.9	<b>7.3</b>	<b>7.5</b>
<b>Mean</b>			<b>7.9</b>	<b>7.0</b>	<b>6.5</b>	<b>6.9</b>	<b>7.2</b>	<b>7.1</b>	<b>6.7</b>	<b>7.9</b>	<b>6.7</b>	<b>7.1</b>	<b>7.1</b>

**Table 7: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT-1B**

Sr. No	Variety	Trial Code	NWPZ						NEPZ				Overall Mean
			Durgapura	Hisar	Ludhiana	Delhi	Pantnagar	Mean	Kanpur	Samastipur	Sabour	Mean	
1	BRW 3748	N-1B-01	77.2	78.0	77.4	80.2	78.2	<b>78.2</b>	80.5	79.8	78.3	<b>79.5</b>	<b>78.7</b>
2	DBW 143	N-1B-02	74.7	73.3	70.8	78.9	75.4	<b>74.6</b>	78.0	79.8	76.8	<b>78.2</b>	<b>76.0</b>
3	HUW 686	N-1B-03	75.0	73.0	74.2	76.7	76.7	<b>75.1</b>	79.6	78.7	76.0	<b>78.1</b>	<b>76.2</b>
4	DBW 145	N-1B-04	74.6	73.2	71.7	76.3	75.6	<b>74.3</b>	76.5	79.0	76.5	<b>77.3</b>	<b>75.4</b>
5	HUW 685	N-1B-05	76.6	71.2	73.0	72.7	75.4	<b>73.8</b>	72.2	74.2	71.6	<b>72.7</b>	<b>73.4</b>
6	WH 1173	N-1B-06	76.4	74.2	75.2	76.6	77.5	<b>76.0</b>	80.7	79.3	76.1	<b>78.7</b>	<b>77.0</b>
7	HD 2733 (C)	N-1B-07	75.8	73.4	65.6	78.0	72.4	<b>73.0</b>	79.4	80.1	75.5	<b>78.3</b>	<b>75.0</b>
8	HD 3159	N-1B-08	74.0	74.8	75.3	74.9	75.7	<b>74.9</b>	79.4	78.9	76.1	<b>78.1</b>	<b>76.1</b>
9	HD 3162	N-1B-09	76.2	76.4	72.4	79.2	77.4	<b>76.3</b>	79.3	80.2	76.5	<b>78.7</b>	<b>77.2</b>
10	NW 6025	N-1B-10	74.7	72.1	64.6	77.7	74.9	<b>72.8</b>	77.8	80.1	76.5	<b>78.1</b>	<b>74.8</b>
11	NW 6023	N-1B-11	75.2	73.5	73.2	78.1	76.4	<b>75.3</b>	77.9	80.2	77.1	<b>78.4</b>	<b>76.5</b>
12	K 1306	N-1B-12	74.8	75.3	73.2	75.1	75.8	<b>74.8</b>	79.7	80.0	76.1	<b>78.6</b>	<b>76.3</b>
13	PBW 714	N-1B-13	77.2	75.7	74.3	78.0	76.2	<b>76.3</b>	78.4	78.7	71.6	<b>76.2</b>	<b>76.3</b>
14	HD 3160	N-1B-14	76.0	74.1	74.3	79.0	75.0	<b>75.7</b>	79.3	78.0	74.7	<b>77.3</b>	<b>76.3</b>
15	PBW 712	N-1B-15	74.9	73.5	73.2	77.8	76.1	<b>75.1</b>	78.2	78.5	74.5	<b>77.1</b>	<b>75.8</b>
16	UP 2878	N-1B-16	75.3	73.3	60.8	74.7	76.5	<b>72.1</b>	79.6	78.4	78.4	<b>78.8</b>	<b>74.6</b>
17	WH 1175	N-1B-17	76.5	73.3	74.3	78.7	76.3	<b>75.8</b>	79.7	77.8	76.5	<b>78.0</b>	<b>76.6</b>
18	UP 2879	N-1B-18	73.6	73.8	54.8	74.7	76.1	<b>70.6</b>	80.5	78.6	73.3	<b>77.5</b>	<b>73.2</b>
19	NW 6033	N-1B-19	75.3	70.3	61.5	74.1	73.7	<b>71.0</b>	79.6	79.8	74.6	<b>78.0</b>	<b>73.6</b>
20	BRW 3743	N-1B-20	78.0	75.8	76.0	79.7	79.0	<b>77.7</b>	79.8	79.6	78.1	<b>79.2</b>	<b>78.3</b>
21	DBW 144	N-1B-21	76.2	74.9	72.1	77.2	76.0	<b>75.3</b>	79.4	79.2	77.5	<b>78.7</b>	<b>76.6</b>
22	DBW 141	N-1B-22	76.2	75.0	77.3	79.4	76.0	<b>76.8</b>	81.2	80.9	75.0	<b>79.0</b>	<b>77.6</b>
23	DBW 142	N-1B-23	75.8	76.3	62.0	78.7	74.3	<b>73.4</b>	72.6	77.0	73.8	<b>74.5</b>	<b>73.8</b>
24	HD 2967 (C)	N-1B-24	74.2	73.1	70.7	77.0	75.9	<b>74.2</b>	77.5	77.5	75.5	<b>76.8</b>	<b>75.2</b>
25	NW 6031	N-1B-25	78.2	73.3	71.7	77.4	77.1	<b>75.5</b>	81.1	79.8	75.5	<b>78.8</b>	<b>76.8</b>
26	WH 1174	N-1B-26	77.3	73.8	75.7	76.9	77.0	<b>76.1</b>	78.9	77.7	72.2	<b>76.3</b>	<b>76.2</b>
27	KDW 2010	N-1B-27	74.0	73.7	59.2	72.2	71.8	<b>70.2</b>	76.1	74.8	68.5	<b>73.1</b>	<b>71.3</b>
28	Ankur BW 249	N-1B-28	79.2	75.3	65.6	79.6	75.4	<b>75.0</b>	78.6	80.7	76.1	<b>78.5</b>	<b>76.3</b>
29	BRW 3747	N-1B-29	73.6	75.1	72.2	77.7	75.3	<b>74.8</b>	78.2	79.6	75.5	<b>77.8</b>	<b>75.9</b>
30	K 1305	N-1B-30	75.7	72.5	73.4	76.7	74.6	<b>74.6</b>	78.2	79.0	74.7	<b>77.3</b>	<b>75.6</b>
31	K 1304	N-1B-31	74.7	73.3	74.3	73.7	74.1	<b>74.0</b>	77.0	77.7	75.6	<b>76.8</b>	<b>75.1</b>
32	PBW 713	N-1B-32	77.6	73.9	77.6	77.1	76.9	<b>76.6</b>	80.0	78.7	77.5	<b>78.7</b>	<b>77.4</b>
33	HUW 682	N-1B-33	74.5	76.7	65.5	78.3	74.9	<b>74.0</b>	79.3	79.6	75.8	<b>78.2</b>	<b>75.6</b>
34	HD 3161	N-1B-34	74.7	72.3	69.2	77.4	73.7	<b>73.5</b>	78.8	77.5	74.2	<b>76.8</b>	<b>74.7</b>
35	UP 2880	N-1B-35	77.4	76.6	66.3	79.1	77.3	<b>75.3</b>	79.8	80.7	76.6	<b>79.0</b>	<b>76.7</b>
36	K 1307	N-1B-36	76.1	74.2	64.4	77.1	76.4	<b>73.6</b>	79.6	79.5	74.4	<b>77.8</b>	<b>75.2</b>
37	HP 1956	N-1B-37	76.8	74.4	58.7	77.0	76.4	<b>72.7</b>	78.7	80.6	75.8	<b>78.4</b>	<b>74.8</b>
38	RAJ 4379	N-1B-38	72.1	71.4	70.2	73.7	72.2	<b>71.9</b>	75.5	76.0	72.5	<b>74.7</b>	<b>73.0</b>
39	NW 6028	N-1B-39	75.9	75.8	78.0	76.5	76.9	<b>76.6</b>	78.2	79.0	74.0	<b>77.1</b>	<b>76.8</b>
40	RAJ 4378	N-1B-40	77.1	75.6	72.7	79.5	75.9	<b>76.2</b>	79.0	79.6	76.8	<b>78.5</b>	<b>77.0</b>
41	K 0307 (C)	N-1B-41	77.1	74.3	72.0	75.9	74.9	<b>74.8</b>	80.0	80.1	76.9	<b>79.0</b>	<b>76.4</b>
42	HUW 684	N-1B-42	76.5	75.2	72.5	76.2	75.3	<b>75.1</b>	78.5	77.9	72.7	<b>76.4</b>	<b>75.6</b>
43	K 1308	N-1B-43	75.7	71.6	60.0	75.3	75.3	<b>71.6</b>	77.0	78.9	74.7	<b>76.9</b>	<b>73.6</b>
44	HI 1606	N-1B-44	77.0	74.5	69.3	76.2	76.5	<b>74.7</b>	81.4	80.2	77.1	<b>79.6</b>	<b>76.5</b>
45	HI 1599	N-1B-45	77.6	76.0	64.9	79.4	78.4	<b>75.3</b>	81.3	80.8	74.4	<b>78.8</b>	<b>76.6</b>
46	HP 1957	N-1B-46	77.5	75.6	63.2	80.8	77.7	<b>75.0</b>	78.6	80.3	77.3	<b>78.7</b>	<b>76.4</b>
47	HUW 683	N-1B-47	75.8	76.8	70.2	78.9	75.5	<b>75.4</b>	79.5	77.4	76.1	<b>77.7</b>	<b>76.3</b>
48	RAJ 4380	N-1B-48	76.3	68.9	71.3	72.6	71.6	<b>72.1</b>	78.0	74.1	74.2	<b>75.4</b>	<b>73.4</b>
49	WH 1105 (C)	N-1B-49	75.9	75.2	74.3	79.0	75.2	<b>75.9</b>	78.9	78.7	75.2	<b>77.6</b>	<b>76.6</b>
<b>Mean</b>			<b>75.9</b>	<b>74.2</b>	<b>70.0</b>	<b>77.1</b>	<b>75.7</b>	<b>74.6</b>	<b>78.7</b>	<b>78.8</b>	<b>75.3</b>	<b>77.6</b>	<b>75.7</b>

**Table 8: Protein Content (%) of *T.aestivum* genotypes in NIVT-1B**

Sr. No	Variety	Trial Code	NWPZ						NEPZ				Overall Mean
			Durgapura	Hisar	Ludhiana	Delhi	Pantnagar	Mean	Kanpur	Samastipur	Sabour	Mean	
1	BRW 3748	N-1B-01	12.6	13.4	12.8	12.9	9.7	<b>12.3</b>	9.7	11.1	12.0	<b>10.9</b>	<b>11.8</b>
2	DBW 143	N-1B-02	13.1	13.4	11.0	13.0	9.2	<b>11.9</b>	8.6	10.6	12.2	<b>10.4</b>	<b>11.4</b>
3	HUW 686	N-1B-03	13.3	14.8	12.4	13.3	13.3	<b>13.4</b>	9.2	12.2	12.3	<b>11.3</b>	<b>12.6</b>
4	DBW 145	N-1B-04	12.7	13.8	12.9	14.5	11.4	<b>13.1</b>	10.2	12.8	14.1	<b>12.4</b>	<b>12.8</b>
5	HUW 685	N-1B-05	12.0	14.4	12.4	12.6	10.5	<b>12.4</b>	10.0	11.8	12.7	<b>11.5</b>	<b>12.1</b>
6	WH 1173	N-1B-06	11.8	13.8	12.2	12.4	11.9	<b>12.4</b>	8.6	12.4	12.2	<b>11.0</b>	<b>11.9</b>
7	HD 2733 (C)	N-1B-07	12.2	14.1	12.6	11.5	11.1	<b>12.3</b>	9.5	10.6	12.4	<b>10.8</b>	<b>11.7</b>
8	HD 3159	N-1B-08	12.0	10.6	11.1	11.9	9.7	<b>11.0</b>	7.1	10.8	11.5	<b>9.8</b>	<b>10.6</b>
9	HD 3162	N-1B-09	14.0	13.7	12.0	13.8	12.5	<b>13.2</b>	11.2	11.3	12.6	<b>11.7</b>	<b>12.6</b>
10	NW 6025	N-1B-10	11.8	13.9	12.0	12.7	12.3	<b>12.5</b>	8.7	10.6	10.8	<b>10.0</b>	<b>11.6</b>
11	NW 6023	N-1B-11	13.4	11.2	12.9	13.9	12.2	<b>12.7</b>	9.5	10.9	12.3	<b>10.9</b>	<b>12.0</b>
12	K 1306	N-1B-12	12.0	14.1	11.5	12.3	10.3	<b>12.0</b>	8.9	10.4	11.5	<b>10.3</b>	<b>11.4</b>
13	PBW 714	N-1B-13	14.1	13.1	13.0	13.1	12.0	<b>13.0</b>	9.6	12.1	12.5	<b>11.4</b>	<b>12.4</b>
14	HD 3160	N-1B-14	12.2	12.6	11.7	11.9	11.7	<b>12.0</b>	9.5	10.6	11.3	<b>10.5</b>	<b>11.4</b>
15	PBW 712	N-1B-15	12.5	14.2	12.0	12.9	10.4	<b>12.4</b>	9.0	10.7	12.3	<b>10.7</b>	<b>11.8</b>
16	UP 2878	N-1B-16	12.5	14.9	12.7	12.4	11.7	<b>12.8</b>	9.6	10.9	11.5	<b>10.6</b>	<b>12.0</b>
17	WH 1175	N-1B-17	12.0	12.6	11.5	13.4	11.8	<b>12.3</b>	8.7	10.8	11.6	<b>10.4</b>	<b>11.5</b>
18	UP 2879	N-1B-18	12.1	12.0	13.4	13.3	11.1	<b>12.4</b>	9.8	11.5	11.9	<b>11.0</b>	<b>11.9</b>
19	NW 6033	N-1B-19	11.8	12.5	12.4	12.2	10.2	<b>11.8</b>	8.7	9.8	10.6	<b>9.7</b>	<b>11.0</b>
20	BRW 3743	N-1B-20	13.0	13.6	11.4	12.6	8.7	<b>11.9</b>	8.1	12.3	10.8	<b>10.4</b>	<b>11.3</b>
21	DBW 144	N-1B-21	12.7	11.2	11.9	12.6	10.9	<b>11.8</b>	9.8	10.6	11.8	<b>10.7</b>	<b>11.4</b>
22	DBW 141	N-1B-22	13.4	15.1	12.7	13.4	11.0	<b>13.1</b>	10.5	11.8	13.5	<b>11.9</b>	<b>12.7</b>
23	DBW 142	N-1B-23	12.8	13.1	10.8	12.9	10.5	<b>12.0</b>	9.5	10.7	12.9	<b>11.0</b>	<b>11.6</b>
24	HD 2967 (C)	N-1B-24	13.0	14.7	10.9	13.2	11.9	<b>12.8</b>	8.7	11.0	13.1	<b>10.9</b>	<b>12.1</b>
25	NW 6031	N-1B-25	12.2	13.7	11.5	13.7	11.9	<b>12.6</b>	9.5	10.5	11.7	<b>10.6</b>	<b>11.8</b>
26	WH 1174	N-1B-26	13.6	13.4	12.7	14.6	12.7	<b>13.4</b>	12.5	12.4	13.2	<b>12.7</b>	<b>13.1</b>
27	KDW 2010	N-1B-27	11.9	11.0	12.6	12.6	11.9	<b>12.0</b>	8.2	10.4	11.5	<b>10.0</b>	<b>11.2</b>
28	Ankur BW 249	N-1B-28	12.2	11.3	11.5	13.2	10.9	<b>11.8</b>	8.2	9.6	11.1	<b>9.6</b>	<b>11.0</b>
29	BRW 3747	N-1B-29	13.1	13.2	11.4	12.8	11.1	<b>12.3</b>	10.9	11.2	11.9	<b>11.3</b>	<b>11.9</b>
30	K 1305	N-1B-30	13.3	13.7	11.6	14.1	10.7	<b>12.7</b>	8.9	10.9	12.1	<b>10.6</b>	<b>11.9</b>
31	K 1304	N-1B-31	12.9	12.9	13.2	14.4	12.8	<b>13.2</b>	10.0	10.9	13.3	<b>11.4</b>	<b>12.5</b>
32	PBW 713	N-1B-32	14.0	12.5	11.2	14.1	11.2	<b>12.6</b>	10.1	11.8	13.4	<b>11.8</b>	<b>12.3</b>
33	HUW 682	N-1B-33	13.9	12.8	12.4	13.7	10.4	<b>12.7</b>	9.1	10.3	12.7	<b>10.7</b>	<b>11.9</b>
34	HD 3161	N-1B-34	13.6	14.0	13.5	13.8	12.5	<b>13.5</b>	9.4	12.3	13.2	<b>11.6</b>	<b>12.8</b>
35	UP 2880	N-1B-35	13.8	13.1	12.4	12.0	9.5	<b>12.2</b>	8.7	11.5	11.8	<b>10.7</b>	<b>11.6</b>
36	K 1307	N-1B-36	13.8	12.8	14.7	13.8	12.4	<b>13.5</b>	11.1	11.6	12.6	<b>11.8</b>	<b>12.8</b>
37	HP 1956	N-1B-37	12.7	13.7	11.7	13.2	11.9	<b>12.6</b>	9.7	10.8	12.9	<b>11.1</b>	<b>12.1</b>
38	RAJ 4379	N-1B-38	12.7	12.9	11.9	14.2	13.5	<b>13.1</b>	10.4	13.4	13.8	<b>12.5</b>	<b>12.9</b>
39	NW 6028	N-1B-39	11.9	10.4	12.5	12.6	12.4	<b>11.9</b>	8.8	10.5	11.0	<b>10.1</b>	<b>11.3</b>
40	RAJ 4378	N-1B-40	12.6	11.8	12.5	12.5	11.8	<b>12.2</b>	11.0	12.1	12.7	<b>11.9</b>	<b>12.1</b>
41	K 0307 (C)	N-1B-41	11.8	11.1	12.1	13.1	12.5	<b>12.1</b>	9.6	9.7	11.2	<b>10.2</b>	<b>11.4</b>
42	HUW 684	N-1B-42	14.1	13.4	12.7	13.4	10.8	<b>12.9</b>	9.3	11.8	12.4	<b>11.1</b>	<b>12.2</b>
43	K 1308	N-1B-43	10.7	13.7	12.7	12.4	10.1	<b>11.9</b>	8.4	10.3	10.5	<b>9.7</b>	<b>11.1</b>
44	HI 1606	N-1B-44	10.7	12.3	10.6	10.7	10.5	<b>11.0</b>	9.2	10.5	11.0	<b>10.2</b>	<b>10.7</b>
45	HI 1599	N-1B-45	11.7	12.7	10.6	11.0	11.6	<b>11.5</b>	8.3	11.2	12.1	<b>10.5</b>	<b>11.2</b>
46	HP 1957	N-1B-46	13.6	13.4	11.8	12.7	12.1	<b>12.7</b>	11.6	11.4	13.1	<b>12.0</b>	<b>12.4</b>
47	HUW 683	N-1B-47	11.6	12.4	12.0	11.1	12.0	<b>11.8</b>	8.3	11.6	11.0	<b>10.3</b>	<b>11.3</b>
48	RAJ 4380	N-1B-48	12.1	15.0	13.7	14.0	13.1	<b>13.5</b>	10.4	14.7	13.8	<b>13.0</b>	<b>13.3</b>
49	WH 1105 (C)	N-1B-49	13.0	13.1	12.5	12.7	10.8	<b>12.4</b>	9.6	11.3	11.3	<b>10.7</b>	<b>11.8</b>
<b>Mean</b>			<b>12.7</b>	<b>13.1</b>	<b>12.2</b>	<b>13.0</b>	<b>11.4</b>	<b>12.4</b>	<b>9.5</b>	<b>11.2</b>	<b>12.2</b>	<b>11.0</b>	<b>11.9</b>

**Table 9: Sedimentation value (ml) of *T.aestivum* genotypes in NIVT-1B**

Sr. No	Variety	Trial Code	NWPZ						NEPZ				Overall Mean
			Durgapura	Hisar	Ludhiana	Delhi	Pantnagar	Mean	Kanpur	Samastipur	Sabour	Mean	
1	BRW 3748	N-1B-01	41	38	35	40	35	<b>38</b>	40	40	40	<b>40</b>	<b>39</b>
2	DBW 143	N-1B-02	41	41	34	37	46	<b>40</b>	43	44	38	<b>42</b>	<b>41</b>
3	HUW 686	N-1B-03	40	40	33	40	44	<b>39</b>	41	41	39	<b>40</b>	<b>40</b>
4	DBW 145	N-1B-04	34	33	30	32	39	<b>34</b>	34	38	34	<b>35</b>	<b>34</b>
5	HUW 685	N-1B-05	45	40	40	42	47	<b>43</b>	40	42	40	<b>41</b>	<b>42</b>
6	WH 1173	N-1B-06	39	30	35	35	40	<b>36</b>	35	34	35	<b>35</b>	<b>35</b>
7	HD 2733 (C)	N-1B-07	39	32	35	35	30	<b>34</b>	35	33	39	<b>36</b>	<b>35</b>
8	HD 3159	N-1B-08	42	38	34	34	41	<b>38</b>	30	39	39	<b>36</b>	<b>37</b>
9	HD 3162	N-1B-09	36	30	30	30	40	<b>33</b>	34	35	42	<b>37</b>	<b>35</b>
10	NW 6025	N-1B-10	45	40	35	35	44	<b>40</b>	40	43	47	<b>43</b>	<b>41</b>
11	NW 6023	N-1B-11	40	32	29	29	40	<b>34</b>	30	39	40	<b>36</b>	<b>35</b>
12	K 1306	N-1B-12	44	35	33	33	42	<b>37</b>	34	30	39	<b>34</b>	<b>36</b>
13	PBW 714	N-1B-13	34	32	30	30	31	<b>31</b>	35	34	35	<b>35</b>	<b>33</b>
14	HD 3160	N-1B-14	41	40	38	38	43	<b>40</b>	32	40	43	<b>38</b>	<b>39</b>
15	PBW 712	N-1B-15	27	32	24	24	29	<b>27</b>	45	35	32	<b>37</b>	<b>31</b>
16	UP 2878	N-1B-16	30	32	30	30	30	<b>30</b>	39	33	33	<b>35</b>	<b>32</b>
17	WH 1175	N-1B-17	41	38	41	36	47	<b>41</b>	44	48	44	<b>45</b>	<b>42</b>
18	UP 2879	N-1B-18	34	35	31	37	33	<b>34</b>	35	42	34	<b>37</b>	<b>35</b>
19	NW 6033	N-1B-19	31	36	34	31	30	<b>32</b>	33	35	35	<b>34</b>	<b>33</b>
20	BRW 3743	N-1B-20	40	38	38	36	35	<b>37</b>	40	38	32	<b>37</b>	<b>37</b>
21	DBW 144	N-1B-21	26	28	21	28	26	<b>26</b>	28	31	28	<b>29</b>	<b>27</b>
22	DBW 141	N-1B-22	31	38	30	31	34	<b>33</b>	37	29	33	<b>33</b>	<b>33</b>
23	DBW 142	N-1B-23	37	35	35	41	38	<b>37</b>	40	41	41	<b>41</b>	<b>39</b>
24	HD 2967 (C)	N-1B-24	39	45	40	40	37	<b>40</b>	45	40	40	<b>42</b>	<b>41</b>
25	NW 6031	N-1B-25	50	42	48	46	44	<b>46</b>	50	39	48	<b>46</b>	<b>46</b>
26	WH 1174	N-1B-26	40	40	35	33	38	<b>37</b>	40	40	45	<b>42</b>	<b>39</b>
27	KDW 2010	N-1B-27	39	35	35	41	42	<b>38</b>	34	38	39	<b>37</b>	<b>38</b>
28	Ankur BW 249	N-1B-28	33	36	30	38	34	<b>34</b>	30	34	33	<b>32</b>	<b>34</b>
29	BRW 3747	N-1B-29	40	40	39	40	38	<b>39</b>	43	40	41	<b>41</b>	<b>40</b>
30	K 1305	N-1B-30	34	30	30	30	32	<b>31</b>	33	34	32	<b>33</b>	<b>32</b>
31	K 1304	N-1B-31	35	38	40	34	38	<b>37</b>	44	32	36	<b>37</b>	<b>37</b>
32	PBW 713	N-1B-32	40	40	36	38	40	<b>39</b>	45	40	39	<b>41</b>	<b>40</b>
33	HUW 682	N-1B-33	40	35	31	36	37	<b>36</b>	32	41	36	<b>36</b>	<b>36</b>
34	HD 3161	N-1B-34	30	30	29	27	30	<b>29</b>	32	28	32	<b>31</b>	<b>30</b>
35	UP 2880	N-1B-35	34	40	32	32	28	<b>33</b>	38	33	33	<b>35</b>	<b>34</b>
36	K 1307	N-1B-36	41	35	37	38	40	<b>38</b>	46	40	39	<b>42</b>	<b>40</b>
37	HP 1956	N-1B-37	43	42	35	34	35	<b>38</b>	33	34	33	<b>33</b>	<b>36</b>
38	RAJ 4379	N-1B-38	30	30	28	30	30	<b>30</b>	28	30	30	<b>29</b>	<b>30</b>
39	NW 6028	N-1B-39	41	37	39	36	35	<b>38</b>	39	39	35	<b>38</b>	<b>38</b>
40	RAJ 4378	N-1B-40	38	34	33	34	28	<b>33</b>	33	35	34	<b>34</b>	<b>34</b>
41	K 0307 (C)	N-1B-41	27	25	23	25	29	<b>26</b>	24	24	24	<b>24</b>	<b>25</b>
42	HUW 684	N-1B-42	38	36	38	33	31	<b>35</b>	34	32	34	<b>33</b>	<b>35</b>
43	K 1308	N-1B-43	43	43	41	34	44	<b>41</b>	30	35	40	<b>35</b>	<b>39</b>
44	HI 1606	N-1B-44	25	25	23	27	28	<b>26</b>	25	29	26	<b>27</b>	<b>26</b>
45	HI 1599	N-1B-45	36	32	31	35	40	<b>35</b>	30	36	31	<b>32</b>	<b>34</b>
46	HP 1957	N-1B-46	42	33	35	35	38	<b>37</b>	34	35	35	<b>35</b>	<b>36</b>
47	HUW 683	N-1B-47	37	34	40	34	35	<b>36</b>	31	33	34	<b>33</b>	<b>35</b>
48	RAJ 4380	N-1B-48	39	37	43	33	38	<b>38</b>	38	33	33	<b>35</b>	<b>37</b>
49	WH 1105 (C)	N-1B-49	39	40	42	45	55	<b>44</b>	44	50	40	<b>45</b>	<b>44</b>
<b>Mean</b>			<b>37</b>	<b>36</b>	<b>34</b>	<b>35</b>	<b>37</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>

## **NIVT 2 (Irrigated Timely Sown)**

Thirty six entries were evaluated from eight centres of Central and Peninsular zones under Irrigated Timely Sown conditions for different quality traits. The overall grain appearance score varied from 6.7 (UP 2881, AKAW 4720) to 7.2 (GW459) with mean value of 6.9. It indicates that overall grain appearance was very good in both the zones and all the centres. The overall test weight varied from 76.4 kg (AKAW 4730) to 81.4 kg (MP 3421) with the mean value of 79.8 kg. Zone wise there was no difference in test weight values. Centre wise it was lowest in Pune (78.0kg) and highest in Niphad (81.3kg). The average values of test weight were above the mark of 78.0kg indicating the suitability of most of the entries to this trait. The overall protein content was in higher range and varied from 12.8% (UAS 360) to the maximum value of 15.1% (PBW 715) with the mean value of 13.3%. The overall mean sedimentation value varied from 38.0 (CG 1014) to 51.0 (PBW715) with the mean value of 43.0. Peninsular Zone showed higher value than central zone. Center wise it was lowest in Indore (31.0) and highest in Dharwad (50.0).



**Table 10: Grain appearance Score (Max-10) of *T.aestivum* genotypes in NIVT 2**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Indore	Kota	JND	P'kheda	Vijapur	Mean	Pune	Dharwad	Niphad	Mean	
1	HD 3164	N-2-01	7.1	6.8	7.1	6.8	7.2	<b>7.0</b>	7.1	7.2	7.2	<b>7.2</b>	<b>7.1</b>
2	UAS 363	N-2-02	6.9	6.9	7.1	7.1	7.0	<b>7.0</b>	6.9	7.0	7.0	<b>7.0</b>	<b>7.0</b>
3	GW 463	N-2-03	6.8	6.9	7.0	7.0	6.9	<b>6.9</b>	6.9	6.7	6.8	<b>6.8</b>	<b>6.9</b>
4	RVW 4205	N-2-04	6.9	6.7	6.9	6.9	6.5	<b>6.8</b>	7.1	7.0	7.0	<b>7.0</b>	<b>6.9</b>
5	JWS 530	N-2-05	6.9	6.9	7.0	7.0	7.2	<b>7.0</b>	6.8	6.9	6.9	<b>6.9</b>	<b>7.0</b>
6	GW 461	N-2-06	7.2	6.6	7.2	7.0	7.3	<b>7.1</b>	6.7	7.0	6.7	<b>6.8</b>	<b>7.0</b>
7	GW 459	N-2-07	7.2	7.0	7.2	7.2	7.4	<b>7.2</b>	7.2	7.1	7.2	<b>7.2</b>	<b>7.2</b>
8	UAS 361	N-2-08	6.9	6.9	6.9	7.0	7.0	<b>6.9</b>	7.0	7.1	7.1	<b>7.1</b>	<b>7.0</b>
9	GW 460	N-2-09	7.1	6.8	7.1	7.0	7.2	<b>7.0</b>	7.1	7.1	7.0	<b>7.1</b>	<b>7.1</b>
10	RAJ 4381	N-2-10	7.0	6.7	7.1	7.0	7.1	<b>7.0</b>	6.8	6.7	7.0	<b>6.8</b>	<b>6.9</b>
11	RAJ 4382	N-2-11	7.1	7.0	7.1	6.9	7.1	<b>7.0</b>	7.0	7.0	7.0	<b>7.0</b>	<b>7.0</b>
12	MACS 6222 (c)	N-2-12	7.1	7.0	7.1	7.1	7.2	<b>7.1</b>	7.1	7.0	7.0	<b>7.0</b>	<b>7.1</b>
13	UAS 362	N-2-13	6.9	7.1	7.1	7.1	7.3	<b>7.1</b>	7.1	7.2	7.1	<b>7.1</b>	<b>7.1</b>
14	DBW 146	N-2-14	7.2	6.9	6.8	7.1	7.3	<b>7.1</b>	7.0	7.1	7.1	<b>7.1</b>	<b>7.1</b>
15	HI 1600	N-2-15	7.0	7.0	7.2	6.7	7.3	<b>7.0</b>	6.9	6.9	7.1	<b>7.0</b>	<b>7.0</b>
16	UAS 360	N-2-16	6.8	6.8	6.8	7.0	7.0	<b>6.9</b>	6.9	7.0	6.9	<b>6.9</b>	<b>6.9</b>
17	MP 1296	N-2-17	7.0	6.6	7.0	6.8	7.2	<b>6.9</b>	7.1	7.1	7.0	<b>7.1</b>	<b>7.0</b>
18	MP 1297	N-2-18	6.9	6.6	6.6	7.0	6.5	<b>6.7</b>	7.1	6.7	7.0	<b>6.9</b>	<b>6.8</b>
19	HI 1602	N-2-19	7.1	6.9	7.0	6.9	7.0	<b>7.0</b>	7.1	7.0	7.1	<b>7.1</b>	<b>7.0</b>
20	MACS 6640	N-2-20	7.2	6.8	6.9	6.8	7.2	<b>7.0</b>	7.1	7.0	7.0	<b>7.0</b>	<b>7.0</b>
21	UP 2881	N-2-21	6.8	6.5	6.7	6.8	6.8	<b>6.7</b>	6.6	6.7	6.8	<b>6.7</b>	<b>6.7</b>
22	HI 1601	N-2-22	7.2	7.0	7.1	7.0	7.2	<b>7.1</b>	7.1	7.0	7.1	<b>7.1</b>	<b>7.1</b>
23	MP 3421	N-2-23	7.1	6.8	6.9	6.7	7.1	<b>6.9</b>	6.8	6.9	7.0	<b>6.9</b>	<b>6.9</b>
24	HI 1603	N-2-24	7.2	7.1	6.9	7.1	7.0	<b>7.1</b>	7.0	7.1	7.1	<b>7.1</b>	<b>7.1</b>
25	GW 458	N-2-25	7.2	6.8	7.2	6.9	7.3	<b>7.1</b>	7.0	7.1	7.0	<b>7.0</b>	<b>7.1</b>
26	PBW 715	N-2-26	7.1	6.8	6.8	7.0	7.3	<b>7.0</b>	6.9	6.9	7.2	<b>7.0</b>	<b>7.0</b>
27	LOK 72	N-2-27	7.0	6.7	7.1	7.0	7.2	<b>7.0</b>	6.9	7.0	7.2	<b>7.0</b>	<b>7.0</b>
28	MP 1298	N-2-28	7.0	6.9	6.9	7.0	6.7	<b>6.9</b>	7.1	6.8	7.0	<b>7.0</b>	<b>6.9</b>
29	MACS 6632	N-2-29	7.1	7.0	7.0	7.1	7.1	<b>7.1</b>	7.0	7.2	7.0	<b>7.1</b>	<b>7.1</b>
30	AKAW 4730	N-2-30	6.8	6.5	6.8	6.9	6.6	<b>6.7</b>	6.8	6.5	6.8	<b>6.7</b>	<b>6.7</b>
31	NIAW 2345	N-2-31	6.8	7.0	6.7	7.0	7.1	<b>6.9</b>	6.8	6.8	7.0	<b>6.9</b>	<b>6.9</b>
32	K 1310	N-2-32	7.0	6.8	6.9	7.1	7.0	<b>7.0</b>	7.0	6.8	7.0	<b>6.9</b>	<b>7.0</b>
33	CG 1014	N-2-33	7.1	6.9	6.8	7.1	7.0	<b>7.0</b>	6.9	7.0	7.0	<b>7.0</b>	<b>7.0</b>
34	WH 1176	N-2-34	7.0	6.9	6.9	7.0	6.8	<b>6.9</b>	6.9	6.9	7.0	<b>6.9</b>	<b>6.9</b>
35	NIAW 2313	N-2-35	7.0	7.1	6.9	7.1	7.3	<b>7.1</b>	7.1	7.0	7.2	<b>7.1</b>	<b>7.1</b>
36	GW 322 (c)	N-2-36	7.1	7.0	7.1	7.0	6.9	<b>7.0</b>	6.7	6.9	7.1	<b>6.9</b>	<b>7.0</b>
	<b>Mean</b>		<b>7.0</b>	<b>6.9</b>	<b>7.0</b>	<b>7.0</b>	<b>7.1</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>

**Table 11: Test weight (kg/hl) of *T.aestivum* genotypes in NIVT 2**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Indore	Kota	JND	P'kheda	Vijapur	Mean	Pune	Dharwad	Niphad	Mean	
1	HD 3164	N-2-01	81.6	80.7	79.6	78.6	78.4	<b>79.8</b>	77.5	78.4	81.6	<b>79.2</b>	<b>79.6</b>
2	UAS 363	N-2-02	78.8	80.1	80.4	80.2	78.5	<b>79.6</b>	77.7	78.4	81.4	<b>79.2</b>	<b>79.4</b>
3	GW 463	N-2-03	80.6	79.4	80.6	81.0	77.9	<b>79.9</b>	79.1	79.6	80.5	<b>79.7</b>	<b>79.8</b>
4	RVW 4205	N-2-04	78.7	78.3	80.4	80.8	75.9	<b>78.8</b>	79.5	78.9	81.4	<b>79.9</b>	<b>79.2</b>
5	JWS 530	N-2-05	79.2	79.0	79.9	80.5	79.4	<b>79.6</b>	76.5	77.9	80.0	<b>78.1</b>	<b>79.1</b>
6	GW 461	N-2-06	81.9	80.7	81.0	81.3	80.6	<b>81.1</b>	77.4	79.1	81.3	<b>79.3</b>	<b>80.4</b>
7	GW 459	N-2-07	81.0	79.7	79.5	79.0	78.8	<b>79.6</b>	77.6	78.9	80.1	<b>78.9</b>	<b>79.3</b>
8	UAS 361	N-2-08	81.0	81.5	81.5	81.5	79.2	<b>80.9</b>	78.9	80.0	82.2	<b>80.4</b>	<b>80.7</b>
9	GW 460	N-2-09	81.9	81.1	81.1	79.8	82.0	<b>81.2</b>	77.7	80.0	81.6	<b>79.8</b>	<b>80.7</b>
10	RAJ 4381	N-2-10	79.4	80.2	80.2	80.5	80.3	<b>80.1</b>	76.2	77.9	80.2	<b>78.1</b>	<b>79.4</b>
11	RAJ 4382	N-2-11	82.7	80.7	81.8	81.7	81.1	<b>81.6</b>	78.2	79.9	82.4	<b>80.2</b>	<b>81.1</b>
12	MACS 6222 (C)	N-2-12	82.8	80.2	81.7	78.8	81.4	<b>81.0</b>	79.0	79.6	82.1	<b>80.2</b>	<b>80.7</b>
13	UAS 362	N-2-13	80.1	80.4	80.6	81.1	78.8	<b>80.2</b>	78.4	79.7	81.3	<b>79.8</b>	<b>80.1</b>
14	DBW 146	N-2-14	82.9	81.2	80.6	81.1	81.8	<b>81.5</b>	78.7	79.5	81.9	<b>80.0</b>	<b>81.0</b>
15	HI 1600	N-2-15	81.4	82.1	82.0	80.0	82.5	<b>81.6</b>	79.5	79.5	82.4	<b>80.5</b>	<b>81.2</b>
16	UAS 360	N-2-16	78.2	79.8	78.9	80.6	77.4	<b>79.0</b>	76.5	78.9	80.4	<b>78.6</b>	<b>78.8</b>
17	MP 1296	N-2-17	80.6	78.0	80.3	81.6	78.9	<b>79.9</b>	78.8	79.2	80.8	<b>79.6</b>	<b>79.8</b>
18	MP 1297	N-2-18	79.9	78.0	79.5	79.6	76.1	<b>78.6</b>	79.8	77.1	80.8	<b>79.2</b>	<b>78.9</b>
19	HI 1602	N-2-19	81.1	80.9	79.8	79.9	79.7	<b>80.3</b>	77.5	79.7	81.1	<b>79.4</b>	<b>80.0</b>
20	MACS 6640	N-2-20	81.5	80.3	80.0	80.0	81.7	<b>80.7</b>	77.1	78.7	81.5	<b>79.1</b>	<b>80.1</b>
21	UP 2881	N-2-21	81.7	80.6	80.0	80.8	80.8	<b>80.8</b>	75.8	77.3	81.7	<b>78.3</b>	<b>79.8</b>
22	HI 1601	N-2-22	82.4	80.9	81.3	78.6	81.8	<b>81.0</b>	78.9	79.4	81.9	<b>80.1</b>	<b>80.7</b>
23	MP 3421	N-2-23	81.9	80.9	80.5	79.7	81.4	<b>80.9</b>	77.7	79.3	81.4	<b>79.5</b>	<b>80.4</b>
24	HI 1603	N-2-24	82.9	81.9	81.5	80.3	81.4	<b>81.6</b>	79.7	80.8	83.3	<b>81.3</b>	<b>81.5</b>
25	GW 458	N-2-25	80.2	79.4	79.6	79.6	80.0	<b>79.8</b>	76.8	78.0	79.7	<b>78.2</b>	<b>79.2</b>
26	PBW 715	N-2-26	81.7	81.2	80.4	81.0	81.7	<b>81.2</b>	77.6	78.8	81.6	<b>79.3</b>	<b>80.5</b>
27	LOK 72	N-2-27	78.6	79.1	79.8	80.8	79.1	<b>79.5</b>	76.2	78.6	80.2	<b>78.3</b>	<b>79.1</b>
28	MP 1298	N-2-28	77.8	78.5	80.2	80.3	76.5	<b>78.7</b>	78.9	78.8	81.0	<b>79.6</b>	<b>79.0</b>
29	MACS 6632	N-2-29	83.1	80.9	81.8	82.0	81.3	<b>81.8</b>	78.3	79.7	82.5	<b>80.2</b>	<b>81.2</b>
30	AKAW 4730	N-2-30	75.5	76.4	77.4	81.4	74.4	<b>77.0</b>	75.5	73.1	78.9	<b>75.8</b>	<b>76.6</b>
31	NIAW 2345	N-2-31	81.3	80.6	81.2	81.2	79.3	<b>80.7</b>	79.4	78.8	82.2	<b>80.1</b>	<b>80.5</b>
32	K 1310	N-2-32	81.3	80.0	79.9	81.6	77.7	<b>80.1</b>	78.8	78.2	81.3	<b>79.4</b>	<b>79.9</b>
33	CG 1014	N-2-33	80.5	79.6	79.6	81.3	78.0	<b>79.8</b>	78.4	79.7	80.9	<b>79.7</b>	<b>79.8</b>
34	WH 1176	N-2-34	80.9	79.6	79.5	79.6	77.5	<b>79.4</b>	80.5	79.2	82.8	<b>80.8</b>	<b>80.0</b>
35	NIAW 2313	N-2-35	82.4	80.9	81.1	78.3	80.7	<b>80.7</b>	79.5	80.0	82.8	<b>80.8</b>	<b>80.7</b>
36	GW 322 (C)	N-2-36	80.1	79.3	79.6	80.2	79.1	<b>79.7</b>	77.8	79.2	80.4	<b>79.1</b>	<b>79.5</b>
	<b>Mean</b>		<b>80.8</b>	<b>80.1</b>	<b>80.4</b>	<b>80.4</b>	<b>79.5</b>	<b>80.2</b>	<b>78.1</b>	<b>78.9</b>	<b>81.3</b>	<b>79.4</b>	<b>79.9</b>

**Table 12: Protein content (%) of *T.aestivum* genotypes in NIVT 2**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Indore	Kota	JND	P'kheda	Vijapur	Mean	Pune	Dharwad	Niphad	Mean	
1	HD 3164	N-2-01	10.4	15.2	15.4	13.5	14.2	<b>13.7</b>	14.4	15.4	14.1	<b>14.6</b>	<b>14.1</b>
2	UAS 363	N-2-02	9.3	13.2	13.3	13.1	12.3	<b>12.2</b>	13.6	14.5	13.1	<b>13.7</b>	<b>12.8</b>
3	GW 463	N-2-03	9.3	13.8	12.7	12.1	12.9	<b>12.2</b>	12.6	14.4	13.0	<b>13.3</b>	<b>12.6</b>
4	RVW 4205	N-2-04	9.0	11.9	13.2	11.5	12.6	<b>11.6</b>	12.8	14.1	12.0	<b>13.0</b>	<b>12.1</b>
5	JWS 530	N-2-05	10.4	12.9	13.9	12.4	12.6	<b>12.4</b>	13.7	15.9	13.6	<b>14.4</b>	<b>13.2</b>
6	GW 461	N-2-06	10.4	13.6	14.2	11.8	13.6	<b>12.7</b>	13.2	15.4	13.9	<b>14.2</b>	<b>13.3</b>
7	GW 459	N-2-07	10.8	12.8	14.5	12.0	14.0	<b>12.8</b>	14.2	15.2	14.4	<b>14.6</b>	<b>13.5</b>
8	UAS 361	N-2-08	9.0	12.3	13.3	11.7	12.8	<b>11.8</b>	13.2	14.3	12.6	<b>13.4</b>	<b>12.4</b>
9	GW 460	N-2-09	11.7	11.6	14.8	12.9	14.1	<b>13.0</b>	14.9	15.5	14.8	<b>15.1</b>	<b>13.8</b>
10	RAJ 4381	N-2-10	11.3	13.6	13.4	12.6	13.1	<b>12.8</b>	13.0	15.1	13.8	<b>14.0</b>	<b>13.2</b>
11	RAJ 4382	N-2-11	11.2	13.5	13.5	12.6	12.8	<b>12.7</b>	13.3	14.9	13.2	<b>13.8</b>	<b>13.1</b>
12	MACS 6222 (C)	N-2-12	10.4	13.6	14.1	11.8	13.9	<b>12.8</b>	13.8	16.5	13.3	<b>14.5</b>	<b>13.4</b>
13	UAS 362	N-2-13	9.7	14.1	14.2	12.6	13.4	<b>12.8</b>	13.9	15.1	13.0	<b>14.0</b>	<b>13.3</b>
14	DBW 146	N-2-14	12.2	15.6	16.0	12.9	14.6	<b>14.3</b>	13.9	17.4	14.2	<b>15.2</b>	<b>14.6</b>
15	HI 1600	N-2-15	11.1	12.8	13.8	11.1	13.0	<b>12.4</b>	13.0	15.3	13.6	<b>14.0</b>	<b>13.0</b>
16	UAS 360	N-2-16	9.2	11.1	12.8	12.0	11.8	<b>11.4</b>	12.2	13.4	12.2	<b>12.6</b>	<b>11.8</b>
17	MP 1296	N-2-17	9.7	16.1	14.6	12.7	13.9	<b>13.4</b>	14.2	15.6	12.8	<b>14.2</b>	<b>13.7</b>
18	MP 1297	N-2-18	9.2	12.2	13.6	11.6	13.4	<b>12.0</b>	12.7	14.9	11.9	<b>13.2</b>	<b>12.4</b>
19	HI 1602	N-2-19	10.6	13.2	14.0	13.1	12.7	<b>12.7</b>	14.4	14.0	12.3	<b>13.6</b>	<b>13.0</b>
20	MACS 6640	N-2-20	10.5	13.7	13.6	12.0	13.5	<b>12.7</b>	13.3	14.9	13.3	<b>13.8</b>	<b>13.1</b>
21	UP 2881	N-2-21	10.7	14.9	15.0	13.4	13.5	<b>13.5</b>	14.0	16.2	14.1	<b>14.8</b>	<b>14.0</b>
22	HI 1601	N-2-22	10.8	14.1	13.1	11.8	12.6	<b>12.5</b>	12.4	15.3	13.5	<b>13.7</b>	<b>13.0</b>
23	MP 3421	N-2-23	10.9	13.7	14.0	12.4	12.7	<b>12.7</b>	13.8	14.9	13.6	<b>14.1</b>	<b>13.3</b>
24	HI 1603	N-2-24	11.0	13.2	14.6	12.2	13.4	<b>12.9</b>	14.7	15.8	14.1	<b>14.9</b>	<b>13.6</b>
25	GW 458	N-2-25	9.7	14.2	14.2	11.4	13.5	<b>12.6</b>	13.7	15.5	14.1	<b>14.4</b>	<b>13.3</b>
26	PBW 715	N-2-26	11.1	15.2	16.2	14.1	14.6	<b>14.2</b>	16.0	16.8	15.1	<b>16.0</b>	<b>14.9</b>
27	LOK 72	N-2-27	10.5	12.7	13.9	12.1	12.8	<b>12.4</b>	13.0	14.8	13.7	<b>13.8</b>	<b>12.9</b>
28	MP 1298	N-2-28	10.5	14.2	14.6	13.0	14.0	<b>13.3</b>	14.3	15.2	13.7	<b>14.4</b>	<b>13.7</b>
29	MACS 6632	N-2-29	9.5	13.9	14.7	11.8	13.7	<b>12.7</b>	13.6	15.9	13.8	<b>14.4</b>	<b>13.4</b>
30	AKAW 4730	N-2-30	10.1	14.5	14.1	12.1	13.6	<b>12.9</b>	13.8	15.4	13.0	<b>14.1</b>	<b>13.3</b>
31	NIAW 2345	N-2-31	10.2	13.5	13.0	12.5	11.6	<b>12.2</b>	13.0	14.0	12.8	<b>13.3</b>	<b>12.6</b>
32	K 1310	N-2-32	10.0	13.8	14.5	12.8	13.7	<b>13.0</b>	13.7	14.8	14.7	<b>14.4</b>	<b>13.5</b>
33	CG 1014	N-2-33	8.9	12.1	13.3	11.4	12.6	<b>11.7</b>	12.2	13.7	12.4	<b>12.8</b>	<b>12.1</b>
34	WH 1176	N-2-34	9.4	13.9	14.2	11.0	14.4	<b>12.6</b>	13.6	14.2	12.6	<b>13.5</b>	<b>12.9</b>
35	NIAW 2313	N-2-35	9.8	13.9	14.3	12.5	12.7	<b>12.6</b>	13.5	14.1	12.8	<b>13.5</b>	<b>13.0</b>
36	GW 322 (C)	N-2-36	9.3	13.0	13.3	11.5	11.8	<b>11.8</b>	12.8	14.2	12.6	<b>13.2</b>	<b>12.3</b>
	<b>Mean</b>		<b>10.2</b>	<b>13.5</b>	<b>14.1</b>	<b>12.3</b>	<b>13.2</b>	<b>12.7</b>	<b>13.6</b>	<b>15.1</b>	<b>13.4</b>	<b>14.0</b>	<b>13.2</b>

**Table 13: Sedimentation value (ml) of *T.aestivum* genotypes in NIVT 2**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Indore	Kota	JND	P'kheda	Vijapur	Mean	Pune	Dharwad	Niphad	Mean	
1	HD 3164	N-2-01	31	52	47	44	44	44	44	50	43	46	44
2	UAS 363	N-2-02	27	45	47	44	45	42	46	49	45	47	44
3	GW 463	N-2-03	25	44	42	39	42	38	39	48	42	43	40
4	RVW 4205	N-2-04	27	40	46	39	45	39	41	47	40	43	41
5	JWS 530	N-2-05	30	41	44	41	42	40	43	53	43	46	42
6	GW 461	N-2-06	32	45	47	39	44	41	40	50	45	45	43
7	GW 459	N-2-07	37	47	48	42	48	44	45	49	48	47	46
8	UAS 361	N-2-08	27	40	44	39	44	39	41	46	42	43	40
9	GW 460	N-2-09	39	38	51	45	49	44	51	51	51	51	47
10	RAJ 4381	N-2-10	34	45	41	41	42	41	39	47	43	43	42
11	RAJ 4382	N-2-11	34	43	42	40	40	40	41	47	39	42	41
12	MACS 6222 (C)	N-2-12	31	43	43	37	44	40	42	52	41	45	42
13	UAS 362	N-2-13	29	48	47	43	49	43	45	51	44	47	45
14	DBW 146	N-2-14	40	53	55	43	51	48	47	60	46	51	49
15	HI 1600	N-2-15	33	40	43	34	39	38	38	50	42	43	40
16	UAS 360	N-2-16	25	38	44	39	42	38	37	46	42	42	39
17	MP 1296	N-2-17	29	50	48	42	47	43	44	50	41	45	44
18	MP 1297	N-2-18	29	41	47	40	48	41	42	50	40	44	42
19	HI 1602	N-2-19	37	45	50	45	45	44	48	48	41	46	45
20	MACS 6640	N-2-20	35	46	48	41	51	44	44	51	45	47	45
21	UP 2881	N-2-21	32	52	51	45	48	46	43	54	47	48	47
22	HI 1601	N-2-22	34	45	42	38	39	40	38	50	43	44	41
23	MP 3421	N-2-23	33	46	45	39	40	41	43	48	45	45	42
24	HI 1603	N-2-24	39	44	49	43	48	45	50	52	47	50	47
25	GW 458	N-2-25	31	46	46	37	46	41	41	52	46	46	43
26	PBW 715	N-2-26	40	52	56	50	51	50	54	54	52	53	51
27	LOK 72	N-2-27	32	43	44	39	42	40	38	47	42	42	41
28	MP 1298	N-2-28	34	47	46	45	49	44	47	54	47	49	46
29	MACS 6632	N-2-29	27	43	47	36	43	39	40	50	43	44	41
30	AKAW 4730	N-2-30	30	48	48	39	45	42	43	50	43	45	43
31	NIAW 2345	N-2-31	29	44	42	41	37	39	40	45	41	42	40
32	K 1310	N-2-32	33	48	52	45	49	45	46	51	50	49	47
33	CG 1014	N-2-33	23	42	44	35	41	37	37	43	39	40	38
34	WH 1176	N-2-34	25	45	49	35	42	39	43	48	43	45	41
35	NIAW 2313	N-2-35	31	48	52	43	46	44	45	46	41	44	44
36	GW 322 (C)	N-2-36	26	41	42	36	37	36	39	46	40	42	38
	<b>Mean</b>		<b>31</b>	<b>45</b>	<b>47</b>	<b>41</b>	<b>45</b>	<b>42</b>	<b>43</b>	<b>50</b>	<b>44</b>	<b>45</b>	<b>43</b>

### **NIVT 3 (Irrigated Late Sown)**

Grain samples of 49 entries including four checks, received from 14 centres, representing four zones (NWPZ, NEPZ, CZ and PZ) under irrigated late sown conditions were evaluated for five different quality parameters namely, grain appearance score, test weight (kg/hl), protein content ( %), sedimentation value (ml) and phenol test score (Table 14 to 18). Overall grain appearance score varied from 5.5 (AKAW 4843) to 6.8 (NIAW 2304) with overall mean value of 6.3. The average highest score was recorded in PZ (7.2) and the lowest in NEPZ (5.4). Centre-wise, highest score was recorded at Niphad (7.8) and lowest at Samastipur (4.4). The overall test weight (kg/hl) varied from 73.7 (AKAW 4843) to 79.1 (MP 3336) with the overall mean value of 77.4. Zone-wise, it was highest in PZ (79.5) and lowest in NWPZ (75.7). Centre-wise, test weight was highest at Pune (79.5) and lowest at Durgapura (71.9). The protein content has been reported at 14% moisture basis. The overall grain protein content varied from 10.8% (HI 1604) to 13.1% (MP 1300) with overall mean value of 12.1%. Zone-wise, protein content was highest in PZ (12.5%) and lowest in NEPZ (11.8%). Centre-wise, it was highest at Durgapura (13.7%) and lowest at Ludhiana (10.4%). Overall sedimentation value (ml) varied from a minimum of 31 (UAS 364) to a maximum value of 46 (HD 3167 and MP 1299). Zone-wise, it was lowest in NWPZ (37) and highest in PZ (45). Centre-wise, it was equal and lowest at Hisar and Ludhiana (29) and highest at Junagarh (49). Overall Phenol test value varied from 0.0 (HI 8756) to 7.4 (UP 2885). Zone-wise, Phenol test value was lowest in NEPZ (4.0) and highest in NWPZ (5.0). Centre-wise, it was lowest at Sabour (3.9) and highest at Durgapura (5.3).

**Table 14: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT 3**

Sr. No.	Entry	Trial Code	NWPZ					NEPZ				CZ					PZ			Overall Mean	
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Kanpur	Samastipur	Sabour	Mean	Indore	Vijapur	Junagarh	Powarkheda	Mean	Pune	Niphad		Mean
1	HD 3170	N-3-1	5.0	4.0	5.2	6.0	5.6	<b>5.2</b>	5.7	4.0	5.2	<b>5.0</b>	6.0	5.2	6.5	5.2	<b>5.7</b>	6.5	7.6	<b>7.1</b>	<b>5.6</b>
2	GW 465	N-3-2	4.0	4.2	5.6	5.2	6.0	<b>5.0</b>	5.6	4.5	5.4	<b>5.2</b>	7.0	5.0	6.6	5.6	<b>6.1</b>	6.0	7.5	<b>6.8</b>	<b>5.6</b>
3	RVW 4204	N-3-3	5.0	4.5	5.0	6.0	6.2	<b>5.3</b>	5.7	4.7	5.5	<b>5.3</b>	6.2	5.8	6.8	5.8	<b>6.2</b>	6.5	7.8	<b>7.2</b>	<b>5.8</b>
4	HD 3167	N-3-4	5.0	4.5	5.2	5.8	5.0	<b>5.1</b>	6.0	4.0	4.7	<b>4.9</b>	5.8	5.5	7.0	5.4	<b>5.9</b>	6.5	7.8	<b>7.2</b>	<b>5.6</b>
5	HD 3169	N-3-5	5.0	4.0	5.0	5.6	4.8	<b>4.9</b>	5.8	4.2	5.8	<b>5.3</b>	5.8	6.2	6.1	5.0	<b>5.8</b>	6.0	7.5	<b>6.8</b>	<b>5.5</b>
6	UAS 364	N-3-6	5.0	4.0	5.2	5.6	5.2	<b>5.0</b>	5.6	4.0	4.6	<b>4.7</b>	6.2	5.0	5.8	5.0	<b>5.5</b>	6.5	7.9	<b>7.2</b>	<b>5.4</b>
7	PBW 718	N-3-7	5.1	4.2	5.5	6.0	6.3	<b>5.4</b>	6.3	5.2	6.6	<b>6.0</b>	7.4	5.8	7.5	6.2	<b>6.7</b>	7.0	8.0	<b>7.5</b>	<b>6.2</b>
8	HI 1563 (C)	N-3-8	5.2	4.0	5.8	6.4	6.8	<b>5.6</b>	6.5	4.0	6.0	<b>5.5</b>	7.6	6.5	8.0	6.2	<b>7.1</b>	6.5	7.9	<b>7.2</b>	<b>6.2</b>
9	PBW 716	N-3-9	5.4	4.6	5.5	6.0	6.4	<b>5.6</b>	6.3	4.0	5.1	<b>5.1</b>	7.2	5.5	7.0	5.7	<b>6.4</b>	6.5	7.7	<b>7.1</b>	<b>5.9</b>
10	WH 1178	N-3-10	5.3	5.0	5.7	6.5	6.8	<b>5.9</b>	5.7	6.0	6.7	<b>6.1</b>	7.4	5.0	8.0	6.8	<b>6.8</b>	7.0	8.2	<b>7.6</b>	<b>6.4</b>
11	MP 3336 (C)	N-3-11	5.6	4.2	5.8	6.4	6.3	<b>5.7</b>	6.0	5.5	6.6	<b>6.0</b>	7.5	5.3	7.3	6.2	<b>6.6</b>	6.5	8.3	<b>7.4</b>	<b>6.3</b>
12	WH 1179	N-3-12	6.0	5.2	5.8	6.6	5.8	<b>5.9</b>	5.8	4.0	5.2	<b>5.0</b>	6.8	4.8	7.8	4.8	<b>6.1</b>	6.5	7.8	<b>7.2</b>	<b>5.9</b>
13	HI 1604	N-3-13	6.0	5.5	5.8	6.8	6.1	<b>6.0</b>	6.0	4.0	6.6	<b>5.5</b>	7.0	5.8	8.0	6.8	<b>6.9</b>	6.5	7.8	<b>7.2</b>	<b>6.3</b>
14	GW 467	N-3-14	5.5	4.0	5.2	6.8	6.7	<b>5.6</b>	5.6	4.4	6.5	<b>5.5</b>	7.5	7.0	8.4	6.0	<b>7.2</b>	7.0	7.2	<b>7.1</b>	<b>6.3</b>
15	RAJ 4385	N-3-15	6.2	5.6	5.6	7.3	5.7	<b>6.1</b>	6.2	4.6	6.8	<b>5.9</b>	7.8	6.8	8.0	5.5	<b>7.0</b>	5.0	6.8	<b>5.9</b>	<b>6.3</b>
16	WH 1021 (C)	N-3-16	6.4	4.2	5.6	6.7	6.0	<b>5.8</b>	6.2	4.0	6.5	<b>5.6</b>	7.6	6.7	7.5	6.5	<b>7.1</b>	8.0	7.3	<b>7.7</b>	<b>6.4</b>
17	K 1313	N-3-17	5.6	5.2	5.5	6.7	6.3	<b>5.9</b>	5.7	4.7	6.3	<b>5.6</b>	6.8	6.3	7.4	6.8	<b>6.8</b>	6.5	7.5	<b>7.0</b>	<b>6.2</b>
18	DBW 148	N-3-18	6.5	6.0	5.6	6.2	5.8	<b>6.0</b>	5.6	4.1	6.6	<b>5.4</b>	7.2	6.6	7.8	6.3	<b>7.0</b>	6.5	7.7	<b>7.1</b>	<b>6.3</b>
19	UP 2884	N-3-19	4.3	5.5	5.6	5.8	6.1	<b>5.5</b>	5.6	4.0	5.8	<b>5.1</b>	6.8	6.5	6.0	6.5	<b>6.5</b>	6.0	7.6	<b>6.8</b>	<b>5.9</b>
20	DBW 151	N-3-20	5.6	5.6	5.4	6.7	6.4	<b>5.9</b>	6.0	4.0	5.8	<b>5.3</b>	7.0	4.8	8.0	6.6	<b>6.6</b>	6.5	7.8	<b>7.2</b>	<b>6.2</b>
21	MP 1299	N-3-21	5.8	6.2	5.5	6.0	6.5	<b>6.0</b>	6.2	4.1	6.2	<b>5.5</b>	7.2	6.6	7.8	6.6	<b>7.1</b>	6.5	7.8	<b>7.2</b>	<b>6.4</b>
22	UP 2885	N-3-22	6.2	5.2	6.0	6.3	6.8	<b>6.1</b>	6.5	4.2	5.7	<b>5.5</b>	7.0	7.3	8.0	6.8	<b>7.3</b>	7.0	8.2	<b>7.6</b>	<b>6.5</b>
23	HUW 688	N-3-23	5.4	6.1	5.4	6.5	6.8	<b>6.0</b>	6.3	4.3	5.6	<b>5.4</b>	6.5	6.2	7.5	6.8	<b>6.8</b>	7.5	8.0	<b>7.8</b>	<b>6.4</b>
24	HI 8756 (d)	N-3-24	4.2	5.6	6.2	7.5	6.6	<b>6.0</b>	5.5	4.2	6.7	<b>5.5</b>	7.5	7.0	8.5	6.2	<b>7.3</b>	7.0	7.3	<b>7.2</b>	<b>6.4</b>
25	WH 1177	N-3-25	7.0	5.2	5.5	6.8	6.6	<b>6.2</b>	6.0	4.1	6.0	<b>5.4</b>	7.3	6.8	7.4	7.0	<b>7.1</b>	6.5	8.3	<b>7.4</b>	<b>6.5</b>
26	NW 6024	N-3-26	6.0	4.2	5.4	6.8	6.3	<b>5.7</b>	5.0	4.5	6.4	<b>5.3</b>	7.5	7.0	7.8	7.2	<b>7.4</b>	6.5	8.1	<b>7.3</b>	<b>6.3</b>
27	UP 2882	N-3-27	5.0	4.6	5.0	6.5	6.3	<b>5.5</b>	5.5	4.4	5.6	<b>5.2</b>	7.3	7.2	7.5	7.2	<b>7.3</b>	6.7	8.2	<b>7.5</b>	<b>6.2</b>
28	RAJ 4384	N-3-28	4.0	4.3	5.2	5.8	6.8	<b>5.2</b>	5.8	4.6	6.1	<b>5.5</b>	7.1	6.4	7.5	7.2	<b>7.1</b>	6.6	7.6	<b>7.1</b>	<b>6.1</b>
29	MP 3420	N-3-29	5.0	4.2	5.1	6.8	4.6	<b>5.1</b>	5.7	4.0	6.5	<b>5.4</b>	7.3	7.0	7.0	7.4	<b>7.2</b>	6.2	7.8	<b>7.0</b>	<b>6.0</b>
30	UP 2883	N-3-30	5.0	4.4	5.0	6.6	5.1	<b>5.2</b>	5.5	4.3	6.2	<b>5.3</b>	7.5	6.7	6.5	6.8	<b>6.9</b>	5.5	7.7	<b>6.6</b>	<b>5.9</b>
31	DBW 147	N-3-31	5.0	4.5	4.5	6.8	4.5	<b>5.1</b>	6.0	4.0	5.7	<b>5.2</b>	5.0	5.8	6.2	5.8	<b>5.7</b>	6.0	8.1	<b>7.1</b>	<b>5.6</b>
32	MP 1300	N-3-32	4.0	4.8	4.5	6.7	4.4	<b>4.9</b>	5.9	4.2	5.3	<b>5.1</b>	4.6	5.7	6.0	6.4	<b>5.7</b>	7.0	8.2	<b>7.6</b>	<b>5.6</b>
33	PBW 717	N-3-33	5.0	4.7	4.8	7.5	4.5	<b>5.3</b>	6.0	4.5	6.6	<b>5.7</b>	6.8	5.0	6.8	7.2	<b>6.5</b>	6.5	8.2	<b>7.4</b>	<b>6.0</b>
34	AKAW 4843	N-3-34	4.0	4.3	4.0	4.0	4.6	<b>4.2</b>	5.4	4.4	5.8	<b>5.2</b>	5.8	6.0	6.8	6.8	<b>6.4</b>	5.0	7.8	<b>6.4</b>	<b>5.3</b>
35	K 1312	N-3-35	6.0	4.6	4.8	5.8	4.2	<b>5.1</b>	4.8	4.1	5.6	<b>4.8</b>	6.2	6.7	7.0	7.2	<b>6.8</b>	7.0	8.3	<b>7.7</b>	<b>5.9</b>
36	CG 1015	N-3-36	5.5	4.4	5.0	6.7	5.5	<b>5.4</b>	5.4	4.6	5.7	<b>5.2</b>	7.3	6.8	7.2	7.4	<b>7.2</b>	6.0	8.1	<b>7.1</b>	<b>6.1</b>
37	BRW 967	N-3-37	4.5	5.0	5.2	6.6	5.8	<b>5.4</b>	5.2	4.3	6.3	<b>5.3</b>	7.5	5.5	7.6	7.2	<b>7.0</b>	7.0	8.4	<b>7.7</b>	<b>6.2</b>
38	K 1314	N-3-38	5.5	5.2	5.6	7.6	4.8	<b>5.7</b>	5.5	4.5	5.8	<b>5.3</b>	7.6	7.3	7.8	7.3	<b>7.5</b>	7.5	8.5	<b>8.0</b>	<b>6.5</b>
39	HUW 687	N-3-39	5.0	4.8	5.4	6.4	5.6	<b>5.4</b>	5.6	4.6	6.4	<b>5.5</b>	7.3	7.4	7.6	7.0	<b>7.3</b>	6.2	7.8	<b>7.0</b>	<b>6.2</b>
40	HD 3166	N-3-40	5.0	4.7	5.2	6.8	5.6	<b>5.5</b>	5.8	4.2	6.3	<b>5.4</b>	7.6	6.8	7.6	6.9	<b>7.2</b>	7.2	7.8	<b>7.5</b>	<b>6.3</b>
41	HD 3168	N-3-41	6.0	5.4	5.8	7.0	5.6	<b>6.0</b>	5.2	4.4	6.6	<b>5.4</b>	7.8	6.2	7.5	7.4	<b>7.2</b>	6.6	7.5	<b>7.1</b>	<b>6.4</b>
42	HD 3165	N-3-42	5.5	5.2	5.4	6.8	5.9	<b>5.8</b>	6.0	4.8	6.5	<b>5.8</b>	7.5	5.2	7.6	7.5	<b>7.0</b>	6.5	7.6	<b>7.1</b>	<b>6.3</b>
43	RAJ 4383	N-3-43	5.0	5.0	5.6	6.8	6.0	<b>5.7</b>	5.8	4.8	6.8	<b>5.8</b>	8.3	7.8	7.8	7.3	<b>7.8</b>	6.8	7.0	<b>6.9</b>	<b>6.5</b>
44	NIAW 2304	N-3-44	4.5	4.8	5.8	5.6	6.7	<b>5.5</b>	6.4	5.9	7.1	<b>6.5</b>	8.2	8.0	8.5	7.6	<b>8.1</b>	7.0	7.0	<b>7.0</b>	<b>6.7</b>
45	GW 466	N-3-45	4.5	5.4	6.0	6.3	4.8	<b>5.4</b>	5.8	4.2	6.0	<b>5.3</b>	8.5	7.6	8.5	7.6	<b>8.1</b>	6.2	7.8	<b>7.0</b>	<b>6.4</b>
46	DBW 150	N-3-46	4.0	5.0	5.6	7.0	5.2	<b>5.4</b>	6.5	4.0	5.7	<b>5.4</b>	7.1	6.0	6.0	7.7	<b>6.7</b>	7.5	8.2	<b>7.9</b>	<b>6.1</b>
47	DBW 149	N-3-47	6.0	6.2	5.8	7.2	5.3	<b>6.1</b>	6.0	4.1	5.8	<b>5.3</b>	6.8	7.2	7.8	7.4	<b>7.3</b>	7.5	8.4	<b>8.0</b>	<b>6.5</b>
48	HD 2932 (C)	N-3-48	4.5	4.2	5.4	4.8	5.6	<b>4.9</b>	6.4	4.0	6.0	<b>5.5</b>	8.0	7.5	7.8	7.2	<b>7.6</b>	7.2	7.8	<b>7.5</b>	<b>6.2</b>
49	PBW 719	N-3-49	5.5	4.6	5.8	7.4	5.3	<b>5.7</b>	5.8	6.0	6.8	<b>6.2</b>	7.8	7.0	7.0	7.5	<b>7.3</b>	6.5	8.3	<b>7.4</b>	<b>6.5</b>
<b>Mean</b>			<b>5.2</b>	<b>4.8</b>	<b>5.4</b>	<b>6.4</b>	<b>5.8</b>	<b>5.5</b>	<b>5.8</b>	<b>4.4</b>	<b>6.0</b>	<b>5.4</b>	<b>7.1</b>	<b>6.3</b>	<b>7.3</b>	<b>6.6</b>	<b>6.8</b>	<b>6.6</b>	<b>7.8</b>	<b>7.2</b>	<b>6.1</b>

**Table 15: Test weight (kg/hl) of *T.aestivum* genotypes in NIVT 3**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				CZ					PZ			Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Kanpur	Samastipur	Sabour	Mean	Indore	Vijapur	Junagarh	Powarkheda	Mean	Pune	Niphad	Mean	
1	HD 3170	N-3-1	76.0	79.4	78.6	79.5	70.1	<b>76.7</b>	75.7	74.8	78.4	<b>76.3</b>	70.6	77.5	80.7	77.0	<b>76.5</b>	80.0	78.4	<b>79.2</b>	<b>76.9</b>
2	GW 465	N-3-2	66.7	75.3	76.1	73.1	70.4	<b>72.3</b>	74.8	74.9	76.8	<b>75.5</b>	79.2	79.0	81.9	79.0	<b>79.8</b>	80.8	79.7	<b>80.3</b>	<b>76.3</b>
3	RVW 4204	N-3-3	76.1	79.9	78.5	74.8	73.2	<b>76.5</b>	75.9	77.5	78.0	<b>77.2</b>	75.5	79.5	80.0	78.7	<b>78.4</b>	79.3	80.7	<b>80.0</b>	<b>77.7</b>
4	HD 3167	N-3-4	78.4	79.3	79.8	77.8	71.6	<b>77.4</b>	76.1	73.2	75.3	<b>74.9</b>	77.7	79.1	77.0	79.0	<b>78.2</b>	81.2	79.9	<b>80.6</b>	<b>77.5</b>
5	HD 3169	N-3-5	76.7	78.1	78.4	76.3	72.4	<b>76.4</b>	79.8	76.4	78.0	<b>78.1</b>	75.1	78.0	76.0	74.1	<b>75.8</b>	79.5	79.2	<b>79.4</b>	<b>77.0</b>
6	UAS 364	N-3-6	74.4	78.0	76.7	72.8	71.0	<b>74.6</b>	73.2	68.3	73.1	<b>71.5</b>	74.0	76.5	79.7	71.6	<b>75.5</b>	80.4	81.7	<b>81.1</b>	<b>75.1</b>
7	PBW 718	N-3-7	78.3	77.9	79.7	76.6	75.0	<b>77.5</b>	78.2	75.7	79.5	<b>77.8</b>	80.2	79.9	79.0	79.4	<b>79.6</b>	80.1	81.6	<b>80.9</b>	<b>78.7</b>
8	HI 1563 (C)	N-3-8	76.8	78.0	80.5	80.1	75.8	<b>78.2</b>	78.6	74.3	78.4	<b>77.1</b>	79.8	80.0	79.6	78.4	<b>79.5</b>	81.2	80.2	<b>80.7</b>	<b>78.7</b>
9	PBW 716	N-3-9	77.0	78.6	79.0	71.9	70.7	<b>75.4</b>	74.8	73.4	75.4	<b>74.5</b>	77.3	75.7	77.9	75.0	<b>76.5</b>	79.8	80.1	<b>80.0</b>	<b>76.2</b>
10	WH 1178	N-3-10	74.5	78.0	76.1	74.8	73.7	<b>75.4</b>	76.0	77.8	76.9	<b>76.9</b>	77.5	72.6	78.1	75.4	<b>75.9</b>	79.4	80.8	<b>80.1</b>	<b>76.5</b>
11	MP 3336 (C)	N-3-11	76.1	78.3	78.0	77.5	75.0	<b>77.0</b>	78.7	79.1	79.4	<b>79.0</b>	80.3	80.0	79.1	79.3	<b>79.7</b>	81.3	80.5	<b>80.9</b>	<b>78.8</b>
12	WH 1179	N-3-12	73.4	78.4	79.5	76.8	70.9	<b>75.8</b>	78.4	70.6	75.1	<b>74.7</b>	75.5	79.2	77.4	71.9	<b>76.0</b>	80.7	77.2	<b>79.0</b>	<b>76.1</b>
13	HI 1604	N-3-13	73.6	77.3	76.5	74.7	69.0	<b>74.2</b>	74.4	69.0	75.7	<b>73.0</b>	69.3	75.4	75.0	74.9	<b>73.7</b>	78.8	77.0	<b>77.9</b>	<b>74.3</b>
14	GW 467	N-3-14	76.1	77.7	77.1	78.1	74.5	<b>76.7</b>	77.7	73.9	79.1	<b>76.9</b>	79.8	79.9	79.3	79.8	<b>79.7</b>	80.3	80.2	<b>80.3</b>	<b>78.1</b>
15	RAJ 4385	N-3-15	78.6	79.8	79.2	79.1	71.6	<b>77.7</b>	79.0	79.3	78.8	<b>79.0</b>	80.2	80.2	78.1	79.8	<b>79.6</b>	80.4	79.1	<b>79.8</b>	<b>78.8</b>
16	WH 1021 (C)	N-3-16	78.7	79.2	77.1	76.1	71.3	<b>76.5</b>	78.6	75.6	77.2	<b>77.1</b>	81.1	80.5	77.6	78.7	<b>79.5</b>	80.7	79.8	<b>80.3</b>	<b>78.0</b>
17	K 1313	N-3-17	76.5	80.6	77.9	79.3	70.2	<b>76.9</b>	79.9	78.1	78.5	<b>78.8</b>	80.3	79.7	79.6	79.6	<b>79.8</b>	80.0	80.6	<b>80.3</b>	<b>78.6</b>
18	DBW 148	N-3-18	75.0	81.6	79.8	78.2	70.7	<b>77.1</b>	77.1	74.1	79.0	<b>76.7</b>	79.7	75.1	77.1	77.9	<b>77.5</b>	79.8	79.9	<b>79.9</b>	<b>77.5</b>
19	UP 2884	N-3-19	72.9	79.7	78.4	72.8	70.1	<b>74.8</b>	75.4	70.8	78.4	<b>74.9</b>	77.1	79.6	79.6	74.8	<b>77.8</b>	79.8	77.4	<b>78.6</b>	<b>76.2</b>
20	DBW 151	N-3-20	74.8	79.9	77.7	77.2	72.4	<b>76.4</b>	78.0	77.6	77.6	<b>77.8</b>	79.0	79.2	77.7	79.0	<b>78.7</b>	79.8	80.1	<b>80.0</b>	<b>77.9</b>
21	MP 1299	N-3-21	72.0	78.2	77.4	72.9	69.6	<b>74.0</b>	74.0	70.1	76.7	<b>73.6</b>	79.7	80.6	74.5	75.1	<b>77.5</b>	78.7	79.1	<b>78.9</b>	<b>75.6</b>
22	UP 2885	N-3-22	76.3	79.7	79.0	79.1	72.0	<b>77.2</b>	80.2	79.1	74.8	<b>78.0</b>	79.0	80.9	79.2	79.1	<b>79.6</b>	80.2	80.0	<b>80.1</b>	<b>78.5</b>
23	HUW 688	N-3-23	73.1	79.8	76.7	74.1	70.1	<b>74.8</b>	75.1	69.4	72.8	<b>72.4</b>	72.1	70.3	79.1	72.3	<b>73.5</b>	79.2	77.7	<b>78.5</b>	<b>74.4</b>
24	HI 8756 (d)	N-3-24	74.8	78.1	79.8	77.5	75.1	<b>77.1</b>	79.7	73.0	77.1	<b>76.6</b>	80.2	80.6	78.7	80.3	<b>80.0</b>	80.4	80.0	<b>80.2</b>	<b>78.2</b>
25	WH 1177	N-3-25	76.6	78.1	78.2	77.1	73.4	<b>76.7</b>	77.5	75.9	77.5	<b>77.0</b>	79.0	79.6	77.1	77.0	<b>78.2</b>	80.6	80.1	<b>80.4</b>	<b>77.7</b>
26	NW 6024	N-3-26	78.0	78.0	78.9	75.1	70.9	<b>76.2</b>	76.6	76.0	79.3	<b>77.3</b>	77.9	80.8	77.0	77.1	<b>78.2</b>	80.9	80.1	<b>80.5</b>	<b>77.6</b>
27	UP 2882	N-3-27	77.2	79.9	78.8	73.8	72.9	<b>76.5</b>	78.2	78.8	75.0	<b>77.4</b>	78.1	81.6	77.1	79.2	<b>79.0</b>	80.5	80.1	<b>80.3</b>	<b>77.9</b>
28	RAJ 4384	N-3-28	74.0	79.5	77.1	75.8	70.7	<b>75.4</b>	77.7	75.1	79.7	<b>77.5</b>	78.7	80.1	80.4	76.8	<b>79.0</b>	79.5	78.4	<b>79.0</b>	<b>77.4</b>
29	MP 3420	N-3-29	71.5	77.0	78.6	71.0	65.7	<b>72.8</b>	73.4	68.6	75.3	<b>72.4</b>	80.1	79.0	80.0	74.8	<b>78.5</b>	79.8	77.4	<b>78.6</b>	<b>75.2</b>
30	UP 2883	N-3-30	74.0	79.5	79.8	77.1	73.0	<b>76.7</b>	76.2	66.8	77.1	<b>73.4</b>	77.0	79.0	79.1	76.3	<b>77.9</b>	80.0	79.1	<b>79.6</b>	<b>76.7</b>
31	DBW 147	N-3-31	78.1	78.8	79.2	76.3	71.6	<b>76.8</b>	76.7	70.2	75.1	<b>74.0</b>	78.2	78.1	78.4	73.0	<b>76.9</b>	79.9	79.1	<b>79.5</b>	<b>76.6</b>
32	MP 1300	N-3-32	73.0	78.4	73.5	75.0	70.2	<b>74.0</b>	78.3	71.1	73.1	<b>74.1</b>	80.3	80.4	79.1	76.4	<b>79.1</b>	80.4	79.5	<b>80.0</b>	<b>76.3</b>
33	PBW 717	N-3-33	75.2	78.8	75.0	77.3	67.8	<b>74.8</b>	78.0	75.3	77.1	<b>76.8</b>	78.9	75.0	79.3	77.1	<b>77.6</b>	79.8	78.8	<b>79.3</b>	<b>76.7</b>
34	AKAW 4843	N-3-34	69.1	75.3	67.2	63.1	66.8	<b>68.3</b>	71.8	68.0	77.1	<b>72.3</b>	78.5	78.2	78.4	74.4	<b>77.4</b>	76.2	77.5	<b>76.9</b>	<b>73.0</b>
35	K 1312	N-3-35	67.8	79.3	73.8	70.0	66.8	<b>71.5</b>	74.7	69.7	73.0	<b>72.5</b>	77.5	80.7	78.6	74.3	<b>77.8</b>	77.1	79.7	<b>78.4</b>	<b>74.5</b>
36	CG 1015	N-3-36	76.1	78.1	74.8	77.8	73.7	<b>76.1</b>	80.1	76.9	79.0	<b>78.7</b>	80.1	80.4	78.6	77.8	<b>79.2</b>	75.8	80.6	<b>78.2</b>	<b>77.8</b>
37	BRW 967	N-3-37	78.3	78.1	77.9	79.1	77.1	<b>78.1</b>	78.4	79.0	76.2	<b>77.9</b>	80.2	80.0	80.6	80.1	<b>80.2</b>	79.6	80.3	<b>80.0</b>	<b>78.9</b>
38	K 1314	N-3-38	77.0	79.0	74.4	76.6	70.3	<b>75.5</b>	80.4	73.9	78.0	<b>77.4</b>	79.1	80.9	80.1	77.7	<b>79.5</b>	79.1	79.1	<b>79.1</b>	<b>77.5</b>
39	HUW 687	N-3-39	77.4	79.9	77.3	76.5	70.1	<b>76.2</b>	79.2	78.0	77.9	<b>78.4</b>	78.5	79.3	71.6	77.3	<b>76.7</b>	78.1	79.4	<b>78.8</b>	<b>77.2</b>
40	HD 3166	N-3-40	74.2	79.1	76.1	77.7	74.7	<b>76.4</b>	78.4	74.8	76.2	<b>76.4</b>	80.7	79.3	79.7	77.3	<b>79.3</b>	78.4	79.8	<b>79.1</b>	<b>77.6</b>
41	HD 3168	N-3-41	77.1	79.6	75.2	74.2	70.2	<b>75.3</b>	77.5	72.7	77.0	<b>75.7</b>	76.7	78.9	79.6	76.2	<b>77.9</b>	78.5	79.1	<b>78.8</b>	<b>76.6</b>
42	HD 3165	N-3-42	76.5	78.0	76.1	79.4	72.1	<b>76.4</b>	78.5	76.7	78.8	<b>78.0</b>	81.5	75.5	80.5	76.2	<b>78.4</b>	79.5	79.4	<b>79.5</b>	<b>77.8</b>
43	RAJ 4383	N-3-43	72.2	79.1	76.8	70.8	75.1	<b>74.8</b>	76.9	79.1	79.4	<b>78.5</b>	80.7	80.7	80.8	77.6	<b>80.0</b>	77.8	78.9	<b>78.4</b>	<b>77.6</b>
44	NIAW 2304	N-3-44	71.0	76.1	73.6	74.9	77.0	<b>74.5</b>	80.0	76.6	73.3	<b>76.6</b>	78.9	79.4	79.3	79.5	<b>79.3</b>	78.8	79.2	<b>79.0</b>	<b>77.0</b>
45	GW 466	N-3-45	73.1	75.1	73.3	79.9	70.7	<b>74.4</b>	77.2	67.3	76.2	<b>73.6</b>	79.0	78.3	81.1	76.5	<b>78.7</b>	78.2	78.2	<b>78.2</b>	<b>76.0</b>
46	DBW 150	N-3-46	76.3	78.8	76.1	77.5	72.3	<b>76.2</b>	80.4	76.7	76.6	<b>77.9</b>	81.6	77.4	79.6	74.5	<b>78.3</b>	79.4	79.3	<b>79.4</b>	<b>77.6</b>
47	DBW 149	N-3-47	77.1	79.9	76.2	71.1	75.6	<b>76.0</b>	79.0	72.1	79.3	<b>76.8</b>	77.6	78.4	79.9	77.4	<b>78.3</b>	78.3	78.4	<b>78.4</b>	<b>77.2</b>
48	HD 2932 (C)	N-3-48	75.4	77.6	73.6	74.4	70.5	<b>74.3</b>	78.1	72.8	78.7	<b>76.5</b>	77.9	79.6	80.5	76.1	<b>78.5</b>	80.5	79.8	<b>80.2</b>	<b>76.8</b>
49	PBW 719	N-3-49	74.1	78.6	76.1	79.0	77.8	<b>77.1</b>	78.6	76.0	77.7	<b>77.4</b>	76.0	79.9	79.7	74.8	<b>77.6</b>	78.9	77.8	<b>78.4</b>	<b>77.5</b>
<b>Mean</b>			<b>75.0</b>	<b>78.6</b>	<b>77.0</b>	<b>75.7</b>	<b>71.9</b>	<b>75.7</b>	<b>77.4</b>	<b>74.2</b>	<b>77.0</b>	<b>76.2</b>	<b>78.2</b>	<b>78.8</b>	<b>78.7</b>	<b>76.8</b>	<b>78.1</b>	<b>79.5</b>	<b>79.4</b>	<b>79.5</b>	<b>77.0</b>

**Table 16: Protein content (%) of *T.aestivum* genotypes in NIVT 3**

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				CZ					PZ			Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Kanpur	Samastipur	Sabour	Mean	Indore	Vijapur	Junagarh	Powarkheda	Mean	Pune	Niphad	Mean	
1	HD 3170	N-3-1	12.1	10.5	11.0	13.4	14.5	12.3	11.3	14.2	11.5	12.3	12.4	12.9	14.6	11.9	12.9	13.3	12.8	13.1	12.6
2	GW 465	N-3-2	12.3	10.8	10.2	12.0	13.4	11.8	10.9	12.5	10.8	11.4	9.9	11.6	13.5	10.4	11.3	13.8	11.8	12.8	11.7
3	RVW 4204	N-3-3	11.8	10.2	11.4	12.0	13.0	11.7	9.9	12.5	9.5	10.7	11.5	11.7	13.0	10.0	11.5	12.7	11.1	11.9	11.5
4	HD 3167	N-3-4	11.7	10.5	11.1	13.9	14.9	12.4	10.8	13.7	12.7	12.4	12.3	14.2	14.8	11.1	13.1	13.0	13.7	13.4	12.7
5	HD 3169	N-3-5	11.7	10.3	10.3	12.9	14.2	11.9	10.5	13.8	10.9	11.8	13.5	13.8	13.8	13.0	13.5	13.5	10.4	11.9	12.3
6	UAS 364	N-3-6	11.1	9.5	10.1	11.5	12.3	10.9	10.2	12.2	10.7	11.0	11.2	10.8	11.9	10.9	11.2	11.2	10.8	11.0	11.0
7	PBW 718	N-3-7	11.8	10.2	10.4	12.8	14.5	11.9	10.5	12.5	10.4	11.1	11.5	11.7	13.7	9.9	11.7	12.2	12.3	12.3	11.7
8	HI 1563 (C)	N-3-8	11.1	10.1	10.6	12.0	13.7	11.5	10.7	11.6	10.5	10.9	10.9	12.1	12.7	12.0	11.9	14.1	11.8	12.9	11.7
9	PBW 716	N-3-9	11.7	9.8	9.6	12.2	13.8	11.4	11.5	13.8	11.9	12.4	10.4	12.2	14.8	11.0	12.1	11.7	10.7	11.2	11.8
10	WH 1178	N-3-10	11.2	10.0	9.5	12.5	14.4	11.5	11.4	13.1	11.6	12.0	11.5	12.0	13.9	11.0	12.1	12.9	12.2	12.6	11.9
11	MP 3336 (C)	N-3-11	12.1	10.7	11.0	12.6	13.2	11.9	11.0	13.0	10.5	11.5	10.9	10.5	12.6	11.3	11.3	13.6	11.2	12.4	11.7
12	WH 1179	N-3-12	11.4	10.1	10.5	12.1	12.7	11.4	10.5	13.8	11.4	11.9	11.9	11.2	13.8	11.3	12.1	11.2	10.1	10.6	11.6
13	HI 1604	N-3-13	11.1	9.1	9.3	12.7	12.3	10.9	9.9	12.2	10.4	10.8	10.8	10.4	12.5	9.9	10.9	10.7	10.1	10.4	10.8
14	GW 467	N-3-14	10.8	8.9	10.3	11.9	12.5	10.9	9.6	12.0	10.7	10.8	10.1	11.6	12.6	10.2	11.1	12.0	11.1	11.5	11.0
15	RAJ 4385	N-3-15	11.2	11.0	10.3	12.7	14.4	11.9	11.8	11.6	11.7	11.7	10.9	12.1	14.4	11.0	12.1	13.6	12.9	13.2	12.1
16	WH 1021 (C)	N-3-16	11.5	10.8	11.0	12.9	13.7	12.0	11.3	13.8	12.5	12.5	11.1	12.8	13.9	10.9	12.2	13.1	13.2	13.1	12.3
17	K 1313	N-3-17	11.5	11.0	11.5	12.4	14.7	12.2	10.6	12.8	10.1	11.1	11.0	12.3	13.5	11.1	12.0	13.2	12.2	12.7	12.0
18	DBW 148	N-3-18	11.5	10.4	11.7	13.0	13.8	12.1	11.3	14.1	10.8	12.1	12.3	12.7	13.4	11.8	12.6	12.5	12.4	12.4	12.3
19	UP 2884	N-3-19	11.3	10.2	10.5	13.1	13.3	11.7	11.0	14.7	10.7	12.1	11.7	13.5	13.4	11.4	12.5	11.4	11.6	11.5	12.0
20	DBW 151	N-3-20	13.0	9.5	12.3	13.7	14.1	12.5	11.4	13.8	11.6	12.2	11.1	12.2	13.8	12.6	12.4	12.9	12.3	12.6	12.5
21	MP 1299	N-3-21	12.5	11.0	10.5	13.0	14.6	12.3	10.9	13.7	10.6	11.7	13.4	14.3	14.9	12.6	13.8	14.9	13.2	14.1	12.9
22	UP 2885	N-3-22	11.7	10.8	11.0	12.2	14.5	12.0	10.6	13.0	9.7	11.1	11.9	12.7	14.7	11.6	12.7	14.1	13.1	13.6	12.3
23	HUW 688	N-3-23	11.7	10.3	11.2	14.2	14.5	12.4	11.1	14.7	12.3	12.7	14.1	12.0	15.0	10.9	13.0	14.1	12.3	13.2	12.7
24	HI 8756 (d)	N-3-24	12.4	10.4	9.8	14.4	11.5	11.7	11.2	14.8	10.3	12.1	11.3	12.6	13.5	11.0	12.1	11.2	11.0	11.1	11.8
25	WH 1177	N-3-25	11.9	11.3	9.9	12.8	14.7	12.1	12.0	13.9	13.2	13.1	11.7	13.1	13.3	12.6	12.7	13.7	13.7	13.7	12.7
26	NW 6024	N-3-26	11.6	10.5	9.8	12.7	14.7	11.9	11.3	13.0	10.5	11.6	11.3	12.3	14.0	11.5	12.3	13.4	11.9	12.7	12.0
27	UP 2882	N-3-27	11.7	9.8	11.0	12.2	12.4	11.4	11.6	11.6	13.2	12.2	10.4	12.4	12.9	11.8	11.9	12.6	11.9	12.3	11.8
28	RAJ 4384	N-3-28	11.8	10.7	10.9	12.3	14.4	12.0	11.2	12.9	11.3	11.8	10.7	11.9	13.0	11.2	11.7	12.6	12.5	12.5	12.0
29	MP 3420	N-3-29	11.6	10.7	10.8	13.3	14.7	12.2	10.3	13.0	11.7	11.7	11.9	11.8	13.4	11.4	12.1	13.2	12.7	13.0	12.2
30	UP 2883	N-3-30	12.0	10.4	11.3	12.1	12.6	11.7	10.4	12.8	11.7	11.6	11.2	12.2	12.5	11.5	11.9	13.6	12.5	13.0	11.9
31	DBW 147	N-3-31	11.0	9.8	10.7	13.3	14.2	11.8	10.4	12.9	9.6	11.0	12.5	12.7	14.7	10.5	12.6	12.3	11.7	12.0	11.9
32	MP 1300	N-3-32	12.6	11.3	10.4	13.9	14.7	12.6	10.8	14.8	13.0	12.9	13.6	13.2	14.6	12.7	13.5	13.9	12.6	13.3	13.0
33	PBW 717	N-3-33	13.0	11.0	10.9	13.5	14.2	12.5	11.4	13.8	12.9	12.7	12.1	10.8	14.2	10.6	11.9	13.5	13.4	13.4	12.5
34	AKAW 4843	N-3-34	12.4	10.7	11.6	14.1	14.8	12.7	10.3	14.2	10.4	11.6	10.5	12.3	12.4	9.8	11.2	12.4	11.7	12.1	12.0
35	K 1312	N-3-35	11.3	10.8	10.2	13.7	14.7	12.2	10.7	14.7	12.2	12.5	12.6	13.0	13.8	11.5	12.7	12.0	10.9	11.5	12.3
36	CG 1015	N-3-36	12.2	9.4	10.6	12.2	12.6	11.4	10.1	12.1	12.7	11.6	11.3	11.6	13.9	12.9	12.4	14.6	12.7	13.6	12.1
37	BRW 967	N-3-37	11.4	10.3	10.3	12.9	13.1	11.6	11.1	12.9	9.8	11.3	10.1	10.0	12.9	12.3	11.3	13.9	11.3	12.6	11.6
38	K 1314	N-3-38	12.4	11.1	11.7	13.6	14.7	12.7	10.7	14.7	11.4	12.3	13.1	13.6	13.9	11.8	13.1	13.5	12.3	12.9	12.8
39	HUW 687	N-3-39	12.0	11.0	10.3	13.6	14.6	12.3	10.3	13.0	11.1	11.5	11.9	12.9	13.9	12.1	12.7	13.5	12.8	13.1	12.4
40	HD 3166	N-3-40	11.4	9.6	9.5	12.2	14.0	11.3	10.1	12.7	11.7	11.5	10.6	11.8	12.6	11.4	11.6	12.5	12.2	12.4	11.6
41	HD 3168	N-3-41	12.1	11.3	11.6	12.4	14.1	12.3	10.2	14.7	10.4	11.8	12.7	13.2	14.0	10.9	12.7	13.3	11.2	12.3	12.3
42	HD 3165	N-3-42	11.7	10.5	10.2	12.3	12.5	11.5	10.5	12.6	11.1	11.4	10.7	10.7	12.8	10.7	11.2	12.4	11.8	12.1	11.5
43	RAJ 4383	N-3-43	12.4	10.6	9.9	11.9	13.3	11.6	11.9	12.7	11.5	12.0	11.5	12.1	13.0	11.9	12.1	13.8	12.5	13.1	12.1
44	NIAW 2304	N-3-44	11.4	10.1	10.7	12.1	11.6	11.2	10.8	13.0	11.1	11.6	10.5	11.0	11.8	11.7	11.2	13.2	10.8	12.0	11.4
45	GW 466	N-3-45	11.0	10.4	10.3	12.3	14.2	11.6	11.4	12.3	11.8	11.8	10.4	12.4	13.0	10.3	11.5	13.7	11.5	12.6	11.8
46	DBW 150	N-3-46	11.8	10.6	11.4	11.6	13.8	11.8	11.0	13.6	12.5	12.3	12.3	12.0	13.7	12.0	12.5	14.1	12.0	13.1	12.3
47	DBW 149	N-3-47	11.9	10.7	11.5	13.4	11.9	11.9	10.8	14.2	12.0	12.3	11.8	11.7	13.6	10.5	11.9	11.6	12.0	11.8	12.0
48	HD 2932 (C)	N-3-48	11.0	10.8	9.6	12.5	13.1	11.4	10.3	12.1	10.0	10.8	10.6	12.5	13.2	10.0	11.6	13.2	12.9	13.1	11.6
49	PBW 719	N-3-49	12.4	11.2	10.9	14.1	14.7	12.7	11.7	13.6	10.7	12.0	11.0	13.3	13.8	12.1	12.6	13.1	13.2	13.1	12.6
<b>Mean</b>			<b>11.8</b>	<b>10.4</b>	<b>10.6</b>	<b>12.8</b>	<b>13.7</b>	<b>11.9</b>	<b>10.8</b>	<b>13.3</b>	<b>11.3</b>	<b>11.8</b>	<b>11.5</b>	<b>12.2</b>	<b>13.5</b>	<b>11.3</b>	<b>12.1</b>	<b>13.0</b>	<b>12.0</b>	<b>12.5</b>	<b>12.0</b>



**Table 17: Sedimentation value (ml) of *T.aestivum* genotypes in NIVT 3**

Sr. No.	Entry	Trial Code	NWPZ					NEPZ				CZ					PZ			Overall Mean	
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Kanpur	Samastipur	Sabour	Mean	Indore	Vijapur	Junagarh	Powarkheda	Mean	Pune	Niphad		Mean
1	HD 3170	N-3-1	35	30	30	49	49	38	31	57	34	41	45	48	53	35	45	50	49	50	43
2	GW 465	N-3-2	34	31	28	42	48	36	30	43	31	35	28	42	52	29	38	49	44	46	38
3	RVW 4204	N-3-3	34	27	31	49	44	37	29	47	25	34	37	41	48	29	39	50	34	42	38
4	HD 3167	N-3-4	37	27	34	55	55	42	31	54	53	46	48	52	56	31	47	51	51	51	45
5	HD 3169	N-3-5	31	24	29	46	47	35	29	54	36	40	50	48	51	46	49	52	25	39	41
6	UAS 364	N-3-6	30	27	27	32	42	31	28	33	28	30	32	31	35	29	32	32	30	31	31
7	PBW 718	N-3-7	34	29	29	46	48	37	30	41	30	34	37	41	50	29	39	45	45	45	38
8	HI 1563 (C)	N-3-8	35	29	29	45	48	37	32	40	35	36	32	47	50	42	43	53	47	50	40
9	PBW 716	N-3-9	32	28	26	37	48	34	32	47	34	38	29	46	51	30	39	39	32	35	37
10	WH 1178	N-3-10	32	29	25	48	48	36	31	52	36	40	39	41	50	30	40	49	47	48	40
11	MP 3336 (C)	N-3-11	42	30	30	48	47	39	31	52	33	39	33	27	49	29	35	52	37	45	39
12	WH 1179	N-3-12	33	23	27	46	47	35	30	57	38	41	44	32	51	32	40	32	24	28	37
13	HI 1604	N-3-13	32	25	25	46	41	34	28	33	29	30	30	31	46	29	34	30	29	30	32
14	GW 467	N-3-14	30	24	26	41	42	33	27	42	29	33	25	39	45	26	34	44	32	38	34
15	RAJ 4385	N-3-15	34	32	28	47	52	39	39	39	44	41	33	46	54	29	40	54	50	52	42
16	WH 1021 (C)	N-3-16	32	30	30	46	48	37	31	50	42	41	34	48	50	30	41	50	49	50	41
17	K 1313	N-3-17	31	30	29	43	49	36	29	44	27	33	30	44	51	30	39	50	44	47	38
18	DBW 148	N-3-18	35	30	31	48	48	38	31	53	32	39	46	47	50	36	45	47	46	46	41
19	UP 2884	N-3-19	33	29	29	48	48	37	30	55	32	39	40	50	48	32	43	34	37	36	39
20	DBW 151	N-3-20	48	27	37	51	48	42	33	56	40	43	31	45	50	42	42	45	45	45	43
21	MP 1299	N-3-21	42	34	29	52	52	42	34	53	35	41	50	52	53	45	50	56	49	52	45
22	UP 2885	N-3-22	33	26	31	42	50	36	29	50	26	35	43	45	51	34	43	52	48	50	40
23	HUW 688	N-3-23	36	30	31	51	47	39	31	53	42	42	50	44	50	32	44	52	48	50	43
24	HI 8756 (d)	N-3-24	39	30	28	51	32	36	33	53	29	38	38	43	50	31	40	38	36	37	38
25	WH 1177	N-3-25	35	30	27	42	47	36	31	48	43	41	36	46	46	42	43	49	47	48	41
26	NW 6024	N-3-26	33	30	26	46	50	37	31	47	30	36	35	40	49	33	39	50	42	46	39
27	UP 2882	N-3-27	34	27	29	44	43	35	31	39	46	39	28	43	48	32	38	44	42	43	38
28	RAJ 4384	N-3-28	33	30	29	40	49	36	31	48	37	38	29	39	50	31	37	45	46	46	38
29	MP 3420	N-3-29	33	29	29	50	54	39	29	45	37	37	45	40	51	32	42	51	49	50	41
30	UP 2883	N-3-30	34	29	30	43	40	35	30	45	33	36	37	49	45	33	41	49	46	48	39
31	DBW 147	N-3-31	32	24	26	50	50	36	30	56	27	38	46	43	53	28	43	45	40	43	39
32	MP 1300	N-3-32	38	31	29	49	49	39	29	49	42	40	46	47	48	44	46	50	47	48	43
33	PBW 717	N-3-33	39	30	29	49	48	39	31	50	42	41	39	30	49	29	37	49	49	49	40
34	AKAW 4843	N-3-34	36	30	31	51	52	40	29	51	31	37	31	45	44	28	37	44	41	43	39
35	K 1312	N-3-35	32	29	29	50	51	38	30	52	39	40	47	49	51	33	45	43	34	38	41
36	CG 1015	N-3-36	35	27	29	44	47	37	29	41	48	39	36	41	50	46	43	53	49	51	41
37	BRW 967	N-3-37	33	28	29	49	48	37	32	51	28	37	24	26	51	42	36	52	38	45	38
38	K 1314	N-3-38	35	29	31	51	51	40	34	57	34	42	50	51	52	38	48	50	47	48	44
39	HUW 687	N-3-39	35	30	29	48	47	38	29	48	33	37	42	47	49	38	44	50	48	49	41
40	HD 3166	N-3-40	32	28	27	42	48	35	29	43	35	36	30	40	47	32	37	47	46	46	38
41	HD 3168	N-3-41	35	29	30	41	46	36	28	50	27	35	42	46	47	29	41	47	31	39	38
42	HD 3165	N-3-42	34	31	29	48	48	38	26	53	39	39	31	36	52	30	37	46	44	45	39
43	RAJ 4383	N-3-43	38	29	26	42	44	36	37	48	38	41	38	44	49	39	42	51	49	50	41
44	NIAW 2304	N-3-44	33	29	30	43	34	34	31	51	33	38	28	30	41	37	34	52	31	42	36
45	GW 466	N-3-45	30	30	29	45	51	37	36	39	39	38	30	45	50	27	38	52	41	47	39
46	DBW 150	N-3-46	34	30	30	37	48	36	30	50	40	40	44	43	50	36	43	52	41	47	40
47	DBW 149	N-3-47	36	30	33	50	42	38	31	54	42	42	44	42	51	27	41	39	46	43	41
48	HD 2932 (C)	N-3-48	31	28	25	45	43	34	27	40	32	33	26	42	48	26	36	48	47	47	36
49	PBW 719	N-3-49	40	30	29	48	48	39	31	48	29	36	30	49	48	38	41	48	48	48	40
<b>Mean</b>			<b>35</b>	<b>29</b>	<b>29</b>	<b>46</b>	<b>47</b>	<b>37</b>	<b>31</b>	<b>48</b>	<b>35</b>	<b>38</b>	<b>37</b>	<b>43</b>	<b>49</b>	<b>33</b>	<b>41</b>	<b>47</b>	<b>42</b>	<b>45</b>	<b>39</b>

**Table 18: Phenol test (Max score 10) of *T.aestivum* genotypes in NIVT 3**

Sr. No.	Entry	Trial Code	NWPZ					NEPZ				CZ					PZ			Overall Mean	
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Kanpur	Samastipur	Sabour	Mean	Indore	Vijapur	Junagarh	Powarkheda	Mean	Pune	Niphad		Mean
1	HD 3170	N-3-1	8.0	4.0	5.0	5.0	8.0	<b>6.0</b>	8.0	7.0	6.0	<b>7.0</b>	5.0	5.0	6.0	6.0	<b>5.5</b>	6.0	5.0	<b>5.5</b>	<b>6.0</b>
2	GW 465	N-3-2	8.0	6.0	6.0	5.0	7.0	<b>6.4</b>	7.0	7.0	6.0	<b>6.7</b>	7.0	7.0	6.0	5.0	<b>6.3</b>	8.0	6.0	<b>7.0</b>	<b>6.5</b>
3	RVW 4204	N-3-3	3.0	4.0	4.0	4.0	5.0	<b>4.0</b>	6.0	6.0	5.0	<b>5.7</b>	4.0	5.0	4.0	4.0	<b>4.3</b>	5.0	4.0	<b>4.5</b>	<b>4.5</b>
4	HD 3167	N-3-4	3.0	3.0	3.0	3.0	3.0	<b>3.0</b>	2.0	4.0	3.0	<b>3.0</b>	3.0	2.0	3.0	3.0	<b>2.5</b>	2.0	3.0	<b>2.5</b>	<b>2.8</b>
5	HD 3169	N-3-5	7.0	5.0	6.0	6.0	5.0	<b>5.8</b>	5.0	6.0	5.0	<b>5.3</b>	6.0	6.0	4.0	5.0	<b>5.3</b>	5.0	5.0	<b>5.0</b>	<b>5.4</b>
6	UAS 364	N-3-6	7.0	6.0	7.0	8.0	6.0	<b>6.8</b>	4.0	6.0	5.0	<b>5.0</b>	7.0	7.0	5.0	6.0	<b>6.3</b>	7.0	5.0	<b>6.0</b>	<b>6.1</b>
7	PBW 718	N-3-7	7.0	6.0	8.0	7.0	7.0	<b>7.0</b>	8.0	8.0	6.0	<b>7.3</b>	8.0	9.0	6.0	7.0	<b>7.5</b>	6.0	4.0	<b>5.0</b>	<b>6.9</b>
8	HI 1563 (C)	N-3-8	2.0	3.0	2.0	2.0	3.0	<b>2.4</b>	4.0	3.0	2.0	<b>3.0</b>	2.0	2.0	2.0	1.0	<b>1.8</b>	2.0	2.0	<b>2.0</b>	<b>2.3</b>
9	PBW 716	N-3-9	8.0	7.0	8.0	8.0	7.0	<b>7.6</b>	7.0	7.0	6.0	<b>6.7</b>	7.0	8.0	6.0	8.0	<b>7.3</b>	5.0	6.0	<b>5.5</b>	<b>7.0</b>
10	WH 1178	N-3-10	3.0	3.0	3.0	3.0	4.0	<b>3.2</b>	3.0	2.0	2.0	<b>2.3</b>	2.0	2.0	2.0	2.0	<b>2.0</b>	6.0	4.0	<b>5.0</b>	<b>2.9</b>
11	MP 3336 (C)	N-3-11	3.0	4.0	3.0	3.0	3.0	<b>3.2</b>	1.0	2.0	2.0	<b>1.7</b>	2.0	1.0	3.0	1.0	<b>1.8</b>	2.0	2.0	<b>2.0</b>	<b>2.3</b>
12	WH 1179	N-3-12	8.0	7.0	8.0	7.0	8.0	<b>7.6</b>	6.0	7.0	6.0	<b>6.3</b>	5.0	8.0	7.0	6.0	<b>6.5</b>	7.0	8.0	<b>7.5</b>	<b>7.0</b>
13	HI 1604	N-3-13	7.0	6.0	7.0	6.0	5.0	<b>6.2</b>	4.0	4.0	4.0	<b>4.0</b>	5.0	7.0	6.0	7.0	<b>6.3</b>	8.0	8.0	<b>8.0</b>	<b>6.0</b>
14	GW 467	N-3-14	3.0	3.0	2.0	2.0	3.0	<b>2.6</b>	2.0	2.0	2.0	<b>2.0</b>	1.0	2.0	2.0	1.0	<b>1.5</b>	2.0	2.0	<b>2.0</b>	<b>2.1</b>
15	RAJ 4385	N-3-15	6.0	6.0	6.0	5.0	6.0	<b>5.8</b>	5.0	4.0	4.0	<b>4.3</b>	5.0	6.0	6.0	6.0	<b>5.8</b>	6.0	7.0	<b>6.5</b>	<b>5.6</b>
16	WH 1021 (C)	N-3-16	8.0	7.0	8.0	8.0	8.0	<b>7.8</b>	7.0	5.0	6.0	<b>6.0</b>	5.0	8.0	6.0	7.0	<b>6.5</b>	6.0	8.0	<b>7.0</b>	<b>6.9</b>
17	K 1313	N-3-17	3.0	3.0	3.0	3.0	4.0	<b>3.2</b>	2.0	2.0	1.0	<b>1.7</b>	2.0	3.0	3.0	4.0	<b>3.0</b>	4.0	3.0	<b>3.5</b>	<b>2.9</b>
18	DBW 148	N-3-18	6.0	6.0	9.0	9.0	7.0	<b>7.4</b>	5.0	4.0	5.0	<b>4.7</b>	5.0	5.0	6.0	7.0	<b>5.8</b>	6.0	5.0	<b>5.5</b>	<b>6.1</b>
19	UP 2884	N-3-19	8.0	7.0	8.0	8.0	6.0	<b>7.4</b>	4.0	5.0	5.0	<b>4.7</b>	6.0	7.0	7.0	7.0	<b>6.8</b>	7.0	6.0	<b>6.5</b>	<b>6.5</b>
20	DBW 151	N-3-20	8.0	8.0	6.0	7.0	8.0	<b>7.4</b>	4.0	4.0	6.0	<b>4.7</b>	7.0	8.0	7.0	8.0	<b>7.5</b>	8.0	7.0	<b>7.5</b>	<b>6.9</b>
21	MP 1299	N-3-21	6.0	7.0	8.0	6.0	8.0	<b>7.0</b>	6.0	6.0	6.0	<b>6.0</b>	6.0	7.0	8.0	8.0	<b>7.3</b>	8.0	7.0	<b>7.5</b>	<b>6.9</b>
22	UP 2885	N-3-22	8.0	7.0	9.0	8.0	7.0	<b>7.8</b>	6.0	7.0	5.0	<b>6.0</b>	7.0	8.0	8.0	8.0	<b>7.8</b>	9.0	7.0	<b>8.0</b>	<b>7.4</b>
23	HUW 688	N-3-23	2.0	2.0	2.0	4.0	3.0	<b>2.6</b>	2.0	1.0	2.0	<b>1.7</b>	2.0	2.0	3.0	3.0	<b>2.5</b>	2.0	2.0	<b>2.0</b>	<b>2.3</b>
24	HI 8756 (d)	N-3-24	0.0	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	<b>0.0</b>	<b>0.0</b>
25	WH 1177	N-3-25	4.0	3.0	3.0	2.0	4.0	<b>3.2</b>	3.0	2.0	2.0	<b>2.3</b>	2.0	2.0	3.0	3.0	<b>2.5</b>	3.0	3.0	<b>3.0</b>	<b>2.8</b>
26	NW 6024	N-3-26	8.0	6.0	7.0	6.0	7.0	<b>6.8</b>	5.0	3.0	4.0	<b>4.0</b>	5.0	7.0	6.0	5.0	<b>5.8</b>	7.0	6.0	<b>6.5</b>	<b>5.9</b>
27	UP 2882	N-3-27	8.0	8.0	8.0	6.0	7.0	<b>7.4</b>	2.0	3.0	2.0	<b>2.3</b>	5.0	7.0	6.0	6.0	<b>6.0</b>	8.0	6.0	<b>7.0</b>	<b>5.9</b>
28	RAJ 4384	N-3-28	3.0	3.0	2.0	2.0	4.0	<b>2.8</b>	2.0	3.0	3.0	<b>2.7</b>	2.0	2.0	3.0	3.0	<b>2.5</b>	3.0	3.0	<b>3.0</b>	<b>2.7</b>
29	MP 3420	N-3-29	3.0	2.0	2.0	2.0	4.0	<b>2.6</b>	3.0	2.0	2.0	<b>2.3</b>	1.0	2.0	2.0	2.0	<b>1.8</b>	2.0	2.0	<b>2.0</b>	<b>2.2</b>
30	UP 2883	N-3-30	3.0	4.0	4.0	4.0	5.0	<b>4.0</b>	4.0	4.0	5.0	<b>4.3</b>	4.0	4.0	4.0	4.0	<b>4.0</b>	5.0	4.0	<b>4.5</b>	<b>4.1</b>
31	DBW 147	N-3-31	8.0	7.0	7.0	8.0	7.0	<b>7.4</b>	6.0	5.0	6.0	<b>5.7</b>	5.0	7.0	6.0	7.0	<b>6.3</b>	8.0	7.0	<b>7.5</b>	<b>6.7</b>
32	MP 1300	N-3-32	3.0	3.0	2.0	3.0	3.0	<b>2.8</b>	2.0	1.0	2.0	<b>1.7</b>	1.0	2.0	2.0	2.0	<b>1.8</b>	3.0	3.0	<b>3.0</b>	<b>2.3</b>
33	PBW 717	N-3-33	8.0	6.0	7.0	8.0	8.0	<b>7.4</b>	6.0	6.0	5.0	<b>5.7</b>	5.0	7.0	6.0	6.0	<b>6.0</b>	6.0	8.0	<b>7.0</b>	<b>6.6</b>
34	AKAW 4843	N-3-34	7.0	7.0	8.0	7.0	9.0	<b>7.6</b>	5.0	5.0	5.0	<b>5.0</b>	7.0	9.0	7.0	8.0	<b>7.8</b>	7.0	7.0	<b>7.0</b>	<b>7.0</b>
35	K 1312	N-3-35	7.0	8.0	9.0	6.0	6.0	<b>7.2</b>	4.0	5.0	6.0	<b>5.0</b>	7.0	8.0	8.0	9.0	<b>8.0</b>	6.0	6.0	<b>6.0</b>	<b>6.8</b>
36	CG 1015	N-3-36	6.0	8.0	6.0	6.0	8.0	<b>6.8</b>	6.0	4.0	5.0	<b>5.0</b>	6.0	7.0	8.0	6.0	<b>6.8</b>	7.0	6.0	<b>6.5</b>	<b>6.4</b>
37	BRW 967	N-3-37	3.0	3.0	2.0	2.0	3.0	<b>2.6</b>	2.0	3.0	2.0	<b>2.3</b>	2.0	3.0	3.0	3.0	<b>2.8</b>	2.0	3.0	<b>2.5</b>	<b>2.6</b>
38	K 1314	N-3-38	2.0	6.0	3.0	6.0	7.0	<b>4.8</b>	1.0	2.0	2.0	<b>1.7</b>	6.0	8.0	6.0	7.0	<b>6.8</b>	7.0	5.0	<b>6.0</b>	<b>4.9</b>
39	HUW 687	N-3-39	2.0	2.0	3.0	3.0	4.0	<b>2.8</b>	4.0	2.0	3.0	<b>3.0</b>	3.0	3.0	4.0	4.0	<b>3.5</b>	2.0	3.0	<b>2.5</b>	<b>3.0</b>
40	HD 3166	N-3-40	5.0	5.0	4.0	5.0	6.0	<b>5.0</b>	4.0	5.0	4.0	<b>4.3</b>	4.0	6.0	6.0	4.0	<b>5.0</b>	4.0	5.0	<b>4.5</b>	<b>4.8</b>
41	HD 3168	N-3-41	6.0	4.0	5.0	5.0	7.0	<b>5.4</b>	5.0	6.0	4.0	<b>5.0</b>	4.0	8.0	8.0	5.0	<b>6.3</b>	6.0	8.0	<b>7.0</b>	<b>5.8</b>
42	HD 3165	N-3-42	7.0	5.0	5.0	7.0	5.0	<b>5.8</b>	5.0	6.0	7.0	<b>6.0</b>	5.0	9.0	9.0	6.0	<b>7.3</b>	8.0	7.0	<b>7.5</b>	<b>6.5</b>
43	RAJ 4383	N-3-43	2.0	3.0	2.0	2.0	2.0	<b>2.2</b>	1.0	1.0	2.0	<b>1.3</b>	1.0	2.0	3.0	2.0	<b>2.0</b>	2.0	2.0	<b>2.0</b>	<b>1.9</b>
44	NIAW 2304	N-3-44	5.0	2.0	5.0	2.0	2.0	<b>3.2</b>	2.0	4.0	3.0	<b>3.0</b>	2.0	2.0	3.0	2.0	<b>2.3</b>	2.0	2.0	<b>2.0</b>	<b>2.7</b>
45	GW 466	N-3-45	6.0	6.0	5.0	7.0	5.0	<b>5.8</b>	6.0	5.0	5.0	<b>5.3</b>	6.0	8.0	6.0	6.0	<b>6.5</b>	6.0	8.0	<b>7.0</b>	<b>6.1</b>
46	DBW 150	N-3-46	3.0	5.0	2.0	3.0	3.0	<b>3.2</b>	2.0	3.0	3.0	<b>2.7</b>	3.0	3.0	3.0	3.0	<b>3.0</b>	1.0	2.0	<b>1.5</b>	<b>2.8</b>
47	DBW 149	N-3-47	5.0	6.0	4.0	4.0	6.0	<b>5.0</b>	6.0	5.0	6.0	<b>5.7</b>	5.0	6.0	4.0	5.0	<b>5.0</b>	6.0	5.0	<b>5.5</b>	<b>5.2</b>
48	HD 2932 (C)	N-3-48	2.0	3.0	3.0	3.0	3.0	<b>2.8</b>	2.0	3.0	2.0	<b>2.3</b>	2.0	3.0	2.0	3.0	<b>2.5</b>	2.0	3.0	<b>2.5</b>	<b>2.6</b>
49	PBW 719	N-3-49	4.0	4.0	4.0	4.0	5.0	<b>4.2</b>	3.0	4.0	3.0	<b>3.3</b>	3.0	4.0	4.0	4.0	<b>3.8</b>	3.0	4.0	<b>3.5</b>	<b>3.8</b>
<b>Mean</b>			<b>5.1</b>	<b>4.9</b>	<b>5.0</b>	<b>4.9</b>	<b>5.3</b>	<b>5.0</b>	<b>4.1</b>	<b>4.1</b>	<b>3.9</b>	<b>4.0</b>	<b>4.2</b>	<b>5.2</b>	<b>4.8</b>	<b>4.8</b>	<b>4.8</b>	<b>5.0</b>	<b>4.8</b>	<b>4.9</b>	<b>4.7</b>

#### **NIVT 4 (Irrigated Timely Sown – *T. durum*)**

Grain samples of 35 durum genotypes and one bread wheat check were received from four sites of NWPZ, five of CZ and three of PZ and were evaluated for grain appearance score, test weight, grain protein and yellow pigment contents, sedimentation value and yellow berry incidence. In comparison to durum and bread wheat checks, the best genotype in grain appearance was PDW 341 with score (7.0) and it exhibited superiority in every zone. Genotypes better than checks (81.0-81.6 kg/hl) could be observed for test weight also and this elite group included PDW 341, GW 1310 and HI 8759 where test weight was 82.4 to 84.1 kg/hl. Overall mean in grain protein content was 12% in all the zones and differences amongst sites were also minimal. Overall range for protein in the test entries was 11.3 to 12.7%. 26 genotypes in this trial had GPC in the range 12.0 to 12.7% but only two i.e. RKD 279 and PDW 342, registered numeric superiority over the checks with GPC 12.7%. Differences amongst three zones were very small in sedimentation value also but sites differences were conspicuous as Durgapura (39ml) was better than Hisar (30ml) in NWPZ, Kota (40ml) was superior than Indore (27ml) in CZ and Dharwad was lot better than Pune (33ml) in PZ. Overall range in the test entries was 27 to 40ml. Only one durum entry i.e. MACS 3949 (40ml) registered sedimentation value matching with the *aestivum* check. Yellow berry incidence was relatively high at Indore (24.9%) and moderate at Ludhiana (11.2%) and Hisar (9.6%). Entries with overall incidence in the range 10 to 15% were HI 8761, HI 8757, UAS 453, MACS 4024, GW 1308, WHD 956, GW 1309 and MPO 1301. Yellow pigment content in NWPZ (5.9ppm) was higher than CZ (5.6ppm) and PZ (5.1ppm). Highest pigmentation was observed at Ludhiana (6.8ppm) and lowest at Junagarh and Niphad (4.8-4.9ppm). Genotypes excelling across all the zones were PDW 955, UAS 452, HD 4732, UPD 96, MACS 4024, MACS 3949, WHD 956 and check NIDW 314 with yellow pigments in the range 6.0 to 6.1ppm.

**Table 19: Grain appearance score of *T. durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagath	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	7.2	6.0	7.0	5.9	<b>6.5</b>	7.1	7.4	7.2	7.5	7.5	<b>7.3</b>	6.2	7.7	7.1	<b>7.0</b>	<b>7.0</b>
2.	WHD 955	N-4-02	5.7	5.8	5.7	5.6	<b>5.7</b>	5.3	5.8	6.0	6.5	7.2	<b>6.2</b>	7.0	6.0	5.2	<b>6.1</b>	<b>6.0</b>
3.	PDW 339	N-4-03	7.5	6.2	5.9	5.8	<b>6.4</b>	4.3	5.7	6.3	6.1	7.4	<b>6.0</b>	6.0	7.3	5.8	<b>6.4</b>	<b>6.2</b>
4.	GW 1310	N-4-04	5.8	5.8	5.5	5.0	<b>5.5</b>	5.6	5.6	7.0	5.8	6.8	<b>6.2</b>	5.8	7.0	6.1	<b>6.3</b>	<b>6.0</b>
5.	HI 8759	N-4-05	5.7	5.6	5.5	5.2	<b>5.5</b>	5.7	5.8	7.2	6.1	7.4	<b>6.4</b>	5.3	6.6	5.9	<b>5.9</b>	<b>6.0</b>
6.	PDW 340	N-4-06	7.8	6.0	5.1	6.0	<b>6.2</b>	4.8	6.2	6.8	6.9	7.1	<b>6.4</b>	5.7	7.3	5.0	<b>6.0</b>	<b>6.2</b>
7.	HI 8761	N-4-07	7.0	5.2	5.0	4.9	<b>5.5</b>	4.7	6.0	5.3	5.4	7.3	<b>5.7</b>	5.9	6.0	5.2	<b>5.7</b>	<b>5.7</b>
8.	UAS 452	N-4-08	5.8	5.0	4.5	5.1	<b>5.1</b>	4.6	6.2	5.2	6.1	7.0	<b>5.8</b>	6.0	5.7	5.8	<b>5.8</b>	<b>5.6</b>
9.	RKD 280	N-4-09	5.0	4.5	4.7	4.8	<b>4.8</b>	5.1	5.8	5.0	5.9	6.8	<b>5.7</b>	5.8	5.8	5.9	<b>5.8</b>	<b>5.4</b>
10.	HI 8757	N-4-10	5.1	4.9	5.6	5.2	<b>5.2</b>	4.2	6.7	5.9	5.8	6.9	<b>5.9</b>	5.3	5.9	5.5	<b>5.6</b>	<b>5.6</b>
11.	MPO1302	N-4-11	7.6	5.9	4.7	5.0	<b>5.8</b>	4.1	6.5	6.1	5.4	6.3	<b>5.7</b>	5.7	6.0	6.0	<b>5.9</b>	<b>5.8</b>
12.	UAS 453	N-4-12	5.6	4.7	4.6	5.4	<b>5.1</b>	4.0	5.4	6.0	5.2	6.4	<b>5.4</b>	6.0	6.1	6.1	<b>6.1</b>	<b>5.5</b>
13.	HI 8758	N-4-13	5.9	5.2	4.7	6.0	<b>5.5</b>	4.1	6.2	6.7	6.0	6.2	<b>5.8</b>	5.2	5.9	5.8	<b>5.6</b>	<b>5.7</b>
14.	RKD 279	N-4-14	5.5	4.8	5.5	5.8	<b>5.4</b>	4.5	6.0	5.8	5.9	7.4	<b>5.9</b>	5.3	7.2	6.1	<b>6.2</b>	<b>5.8</b>
15.	PBND5128	N-4-15	6.0	4.9	4.5	5.4	<b>5.2</b>	4.2	5.8	6.0	5.3	6.4	<b>5.5</b>	5.7	5.8	6.7	<b>6.1</b>	<b>5.6</b>
16.	NIDW 841	N-4-16	5.7	4.6	4.2	6.0	<b>5.1</b>	5.2	6.0	5.8	6.4	6.0	<b>5.9</b>	6.0	5.9	6.3	<b>6.1</b>	<b>5.7</b>
17.	NIDW 842	N-4-17	7.0	5.2	4.5	5.9	<b>5.7</b>	4.0	6.3	6.2	6.2	5.9	<b>5.7</b>	6.1	6.0	6.4	<b>6.2</b>	<b>5.8</b>
18.	HI 8760	N-4-18	5.3	5.6	5.1	5.8	<b>5.5</b>	5.3	6.8	6.5	6.3	7.0	<b>6.4</b>	5.4	5.8	5.4	<b>5.5</b>	<b>5.9</b>
19.	HD 4732	N-4-19	6.0	5.7	5.3	6.2	<b>5.8</b>	5.1	6.7	7.2	6.2	7.6	<b>6.6</b>	6.0	6.3	5.8	<b>6.0</b>	<b>6.2</b>
20.	UPD 96	N-4-20	6.1	5.8	5.1	6.0	<b>5.8</b>	3.0	6.2	6.3	5.4	6.5	<b>5.5</b>	6.1	5.8	5.8	<b>5.9</b>	<b>5.7</b>
21.	PDW 342	N-4-21	5.8	6.0	4.6	5.9	<b>5.6</b>	3.5	5.9	6.0	6.4	5.8	<b>5.5</b>	5.8	6.4	5.7	<b>6.0</b>	<b>5.7</b>
22.	HD 4731	N-4-22	6.0	5.2	5.7	5.8	<b>5.7</b>	3.3	6.0	5.3	6.2	5.7	<b>5.3</b>	5.4	5.8	5.2	<b>5.5</b>	<b>5.5</b>
23.	GW 1311	N-4-23	6.1	5.3	4.9	6.0	<b>5.6</b>	3.2	5.6	5.8	6.1	7.3	<b>5.6</b>	5.9	6.0	5.8	<b>5.9</b>	<b>5.7</b>
24.	HI 8498 (C)	N-4-24	5.4	5.4	6.1	5.3	<b>5.6</b>	5.1	6.7	5.9	6.5	5.6	<b>6.0</b>	5.8	5.9	5.7	<b>5.8</b>	<b>5.8</b>
25.	HD 2967 (C)	N-4-25	5.7	5.9	6.5	5.2	<b>5.8</b>	5.1	5.4	5.7	5.9	6.0	<b>5.6</b>	5.6	5.8	5.3	<b>5.6</b>	<b>5.7</b>
26.	MACS 4024	N-4-26	7.1	5.2	5.7	5.8	<b>6.0</b>	5.3	5.9	7.0	6.0	5.1	<b>5.9</b>	6.3	6.4	5.7	<b>6.1</b>	<b>6.0</b>
27.	DDW 31	N-4-27	5.2	5.0	5.6	5.6	<b>5.4</b>	3.3	5.2	6.8	5.9	6.3	<b>5.5</b>	5.2	5.8	6.1	<b>5.7</b>	<b>5.5</b>
28.	GW 1308	N-4-28	6.9	5.3	6.1	5.9	<b>6.1</b>	3.7	6.2	6.9	7.1	5.9	<b>6.0</b>	5.1	6.0	6.2	<b>5.8</b>	<b>5.9</b>
29.	MACS 3949	N-4-29	6.5	5.8	5.9	6.1	<b>6.1</b>	3.1	5.0	5.8	5.9	6.8	<b>5.3</b>	4.9	6.4	5.9	<b>5.7</b>	<b>5.7</b>
30.	WHD 956	N-4-30	4.7	6.0	5.5	5.7	<b>5.5</b>	3.0	5.2	5.9	5.8	7.0	<b>5.4</b>	6.0	6.1	5.8	<b>6.0</b>	<b>5.6</b>
31.	NIDW 295 (C)	N-4-31	5.6	5.8	5.6	5.6	<b>5.7</b>	5.8	5.8	5.7	6.2	5.8	<b>5.9</b>	5.8	6.2	5.7	<b>5.9</b>	<b>5.8</b>
32.	DDW 32	N-4-32	5.8	4.3	4.5	5.8	<b>5.1</b>	3.3	5.3	5.2	5.9	5.6	<b>5.1</b>	5.2	6.0	5.3	<b>5.5</b>	<b>5.2</b>
33.	GW 1309	N-4-33	5.7	4.9	4.4	4.3	<b>4.8</b>	3.4	4.6	5.3	6.1	5.4	<b>5.0</b>	5.6	5.9	6.1	<b>5.9</b>	<b>5.1</b>
34.	PDW 314 (C)	N-4-34	5.3	5.8	5.9	5.8	<b>5.7</b>	5.2	5.3	5.9	5.8	5.6	<b>5.6</b>	5.4	5.5	5.3	<b>5.4</b>	<b>5.6</b>
35.	MPO 1301	N-4-35	5.2	4.2	4.6	4.5	<b>4.6</b>	3.3	5.8	5.3	5.9	5.7	<b>5.2</b>	5.5	5.7	5.7	<b>5.6</b>	<b>5.1</b>
36.	MACS 4023	N-4-36	5.0	5.0	4.8	4.6	<b>4.9</b>	3.4	5.7	5.6	5.2	5.8	<b>5.1</b>	5.4	5.8	5.6	<b>5.6</b>	<b>5.2</b>
	<b>Mean</b>		<b>6.0</b>	<b>5.3</b>	<b>5.3</b>	<b>5.5</b>	<b>5.5</b>	<b>4.4</b>	<b>5.9</b>	<b>6.1</b>	<b>6.0</b>	<b>6.5</b>	<b>5.8</b>	<b>5.7</b>	<b>6.2</b>	<b>5.8</b>	<b>5.9</b>	<b>5.7</b>

**Table 20: Test weight (kg/hl) of *T. durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagarh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	81.3	82.3	83.7	84.7	<b>83.0</b>	86.2	82.5	86.6	85.3	84.6	<b>85.0</b>	82.2	85.6	84.6	<b>84.1</b>	<b>84.1</b>
2.	WHD 955	N-4-02	77.3	80.2	73.6	73.6	<b>76.2</b>	81.5	78.7	83.1	81.7	75.5	<b>80.1</b>	75.7	83.3	79.9	<b>79.6</b>	<b>78.7</b>
3.	PDW 339	N-4-03	82.4	82.3	80.9	80.9	<b>81.6</b>	81.6	83.8	85.6	85.2	81.2	<b>83.0</b>	81.3	83.4	83.9	<b>82.9</b>	<b>82.4</b>
4.	GW 1310	N-4-04	80.1	83.3	79.7	79.5	<b>80.7</b>	84.7	83.9	84.2	84.3	84.9	<b>84.4</b>	81.0	85.6	82.9	<b>83.2</b>	<b>82.8</b>
5.	HI 8759	N-4-05	80.7	80.9	80.5	80.5	<b>80.7</b>	86.3	82.0	85.1	84.7	83.2	<b>84.3</b>	82.9	84.7	85.2	<b>84.3</b>	<b>83.1</b>
6.	PDW 340	N-4-06	81.9	79.3	78.2	78.2	<b>79.4</b>	82.6	82.0	84.1	84.3	82.0	<b>83.0</b>	81.3	86.4	84.8	<b>84.2</b>	<b>82.1</b>
7.	HI 8761	N-4-07	82.2	81.2	79.3	76.8	<b>79.9</b>	84.6	84.1	80.3	85.9	82.5	<b>83.5</b>	79.9	83.3	79.7	<b>81.0</b>	<b>81.7</b>
8.	UAS 452	N-4-08	81.6	83.3	80.3	75.5	<b>80.2</b>	84.5	82.4	84.4	84.9	83.4	<b>83.9</b>	78.4	85.3	81.2	<b>81.6</b>	<b>82.1</b>
9.	RKD 280	N-4-09	78.8	78.0	78.4	76.7	<b>78.0</b>	83.3	81.6	84.6	84.6	83.2	<b>83.5</b>	80.7	84.2	82.4	<b>82.4</b>	<b>81.4</b>
10.	HI 8757	N-4-10	80.1	81.9	79.3	77.1	<b>79.6</b>	83.2	84.6	84.3	83.5	80.4	<b>83.2</b>	82.6	83.8	82.6	<b>83.0</b>	<b>82.0</b>
11.	MPO1302	N-4-11	80.5	81.1	80.3	77.9	<b>80.0</b>	83.2	83.9	83.8	84.6	81.9	<b>83.5</b>	80.9	84.7	82.4	<b>82.7</b>	<b>82.1</b>
12.	UAS 453	N-4-12	80.7	78.7	77.0	76.7	<b>78.3</b>	83.4	83.8	82.4	84.0	83.6	<b>83.4</b>	80.5	83.8	83.2	<b>82.5</b>	<b>81.5</b>
13.	HI 8758	N-4-13	82.7	84.2	79.4	73.3	<b>79.9</b>	84.4	84.6	82.9	84.3	84.3	<b>84.1</b>	78.2	83.9	82.7	<b>81.6</b>	<b>82.1</b>
14.	RKD 279	N-4-14	76.8	77.3	77.4	89.8	<b>80.3</b>	82.7	80.8	85.7	84.4	81.4	<b>83.0</b>	80.5	83.2	80.5	<b>81.4</b>	<b>81.7</b>
15.	PBND5128	N-4-15	80.9	76.6	79.9	79.9	<b>79.3</b>	83.2	83.2	85.1	82.6	33.2	<b>73.5</b>	78.4	84.1	82.4	<b>81.6</b>	<b>77.5</b>
16.	NIDW 841	N-4-16	80.5	78.7	78.8	78.2	<b>79.1</b>	82.9	84.7	83.4	83.6	79.5	<b>82.8</b>	80.5	84.4	85.4	<b>83.4</b>	<b>81.7</b>
17.	NIDW 842	N-4-17	79.2	77.4	75.4	75.7	<b>76.9</b>	82.4	80.0	78.4	83.4	77.4	<b>80.3</b>	78.4	85.4	82.5	<b>82.1</b>	<b>79.6</b>
18.	HI 8760	N-4-18	77.4	77.2	74.2	81.8	<b>77.7</b>	84.6	83.0	84.3	83.3	82.3	<b>83.5</b>	75.7	84.2	81.3	<b>80.4</b>	<b>80.8</b>
19.	HD 4732	N-4-19	80.7	80.4	80.4	71.9	<b>78.4</b>	83.0	81.2	82.7	81.6	80.8	<b>81.9</b>	80.9	84.2	83.3	<b>82.8</b>	<b>80.9</b>
20.	UPD 96	N-4-20	81.4	80.7	78.1	76.9	<b>79.3</b>	82.1	83.4	84.2	83.9	80.7	<b>82.9</b>	80.6	86.2	84.9	<b>83.9</b>	<b>81.9</b>
21.	PDW 342	N-4-21	82.9	79.7	76.5	79.9	<b>79.8</b>	85.3	83.3	82.7	84.7	79.6	<b>83.1</b>	82.8	85.2	81.4	<b>83.1</b>	<b>82.0</b>
22.	HD 4731	N-4-22	91.2	78.3	79.3	79.5	<b>82.1</b>	83.4	84.0	86.2	85.4	83.2	<b>84.4</b>	81.8	87.4	82.8	<b>84.0</b>	<b>83.5</b>
23.	GW 1311	N-4-23	80.6	81.4	80.3	76.9	<b>79.8</b>	82.3	79.7	84.3	84.7	81.7	<b>82.5</b>	79.6	79.7	76.6	<b>78.6</b>	<b>80.7</b>
24.	HI 8498 (C)	N-4-24	80.3	80.7	72.8	79.5	<b>78.3</b>	85.4	80.0	85.3	82.1	82.5	<b>83.1</b>	78.5	82.3	82.1	<b>81.0</b>	<b>81.0</b>
25.	HD 2967 (C)	N-4-25	81.3	82.4	80.4	75.8	<b>80.0</b>	83.2	80.4	85.0	83.3	79.5	<b>82.3</b>	79.6	82.5	82.6	<b>81.6</b>	<b>81.3</b>
26.	MACS 4024	N-4-26	82.2	80.9	78.6	80.9	<b>80.7</b>	83.4	83.8	80.8	84.7	82.5	<b>83.0</b>	81.7	86.3	82.4	<b>83.5</b>	<b>82.4</b>
27.	DDW 31	N-4-27	81.6	83.2	76.5	79.3	<b>80.2</b>	83.6	81.3	84.6	84.5	80.8	<b>83.0</b>	78.9	84.6	80.7	<b>81.4</b>	<b>81.6</b>
28.	GW 1308	N-4-28	80.5	80.5	79.3	79.3	<b>79.9</b>	79.3	80.5	85.3	84.4	83.5	<b>82.6</b>	82.2	85.4	81.3	<b>83.0</b>	<b>81.8</b>
29.	MACS 3949	N-4-29	79.2	81.1	80.3	76.8	<b>79.4</b>	83.7	82.9	86.0	84.9	76.9	<b>82.9</b>	81.5	83.6	80.7	<b>81.9</b>	<b>81.5</b>
30.	WHD 956	N-4-30	74.4	77.5	72.8	79.3	<b>76.0</b>	80.3	79.7	80.8	82.1	81.3	<b>80.8</b>	77.6	83.6	81.8	<b>81.0</b>	<b>79.3</b>
31.	NIDW 295 (C)	N-4-31	78.8	78.5	79.8	77.3	<b>78.6</b>	83.2	80.0	86.6	83.3	76.6	<b>82.4</b>	80.4	85.4	81.2	<b>82.3</b>	<b>81.0</b>
32.	DDW 32	N-4-32	79.1	74.1	77.2	75.6	<b>76.5</b>	80.3	80.4	81.3	81.1	77.5	<b>80.1</b>	78.9	83.6	80.1	<b>80.9</b>	<b>79.1</b>
33.	GW 1309	N-4-33	80	81.7	78.1	78.7	<b>79.6</b>	83.2	83.8	83.5	83.6	81.9	<b>83.2</b>	81.3	84.1	82.7	<b>82.7</b>	<b>81.9</b>
34.	PDW 314 (C)	N-4-34	78.4	80.3	79.7	76.4	<b>78.7</b>	83.9	81.3	85.0	84.9	80.9	<b>83.2</b>	79.4	84.1	84.7	<b>82.7</b>	<b>81.6</b>
35.	MPO 1301	N-4-35	73.7	77.4	74.3	77.2	<b>75.7</b>	77.8	80.5	75.5	76.1	78.7	<b>77.7</b>	78.4	87.3	75.3	<b>80.3</b>	<b>77.7</b>
36.	MACS 4023	N-4-36	78.8	80.2	78.8	72.6	<b>77.6</b>	82.3	82.9	82.6	82.6	83.7	<b>82.8</b>	82.6	85.1	80.5	<b>82.7</b>	<b>81.1</b>
	<b>Mean</b>		<b>80.3</b>	<b>80.1</b>	<b>78.3</b>	<b>78.1</b>	<b>79.2</b>	<b>83.1</b>	<b>82.2</b>	<b>83.6</b>	<b>83.7</b>	<b>79.9</b>	<b>82.5</b>	<b>80.2</b>	<b>84.4</b>	<b>82.0</b>	<b>82.2</b>	<b>81.3</b>

**Table 21: Protein content (%) of *T. durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagarh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	12.8	11.8	12.8	11.8	<b>12.3</b>	12.8	11.4	12.8	12.6	12.8	<b>12.5</b>	12.6	13.0	12.8	<b>12.8</b>	<b>12.5</b>
2.	WHD 955	N-4-02	10.6	12.2	11.0	11.6	<b>11.4</b>	10.6	11.2	11.0	11.0	11.4	<b>11.0</b>	11.8	12.2	12.4	<b>12.1</b>	<b>11.4</b>
3.	PDW 339	N-4-03	10.8	11.6	11.6	11.0	<b>11.3</b>	12.4	12.6	12.6	12.0	11.6	<b>12.2</b>	11.6	12.4	12.6	<b>12.2</b>	<b>11.9</b>
4.	GW 1310	N-4-04	11.2	12.0	11.4	12.4	<b>11.8</b>	13.2	12.8	12.8	13.0	12.0	<b>12.8</b>	13.2	12.8	13.0	<b>13.0</b>	<b>12.5</b>
5.	HI 8759	N-4-05	10.4	11.2	10.6	11.0	<b>10.8</b>	11.4	11.3	11.8	11.0	11.4	<b>11.4</b>	12.0	11.6	12.2	<b>11.9</b>	<b>11.3</b>
6.	PDW 340	N-4-06	11.2	12.4	11.6	12.1	<b>11.8</b>	12.8	11.8	12.6	12.8	11.6	<b>12.3</b>	11.8	12.2	12.4	<b>12.1</b>	<b>12.1</b>
7.	HI 8761	N-4-07	11.8	11.4	11.5	11.8	<b>11.6</b>	11.2	11.6	12.0	11.4	12.2	<b>11.7</b>	11.6	11.8	12.6	<b>12.0</b>	<b>11.7</b>
8.	UAS 452	N-4-08	11.8	12.3	12.4	11.2	<b>11.9</b>	12.8	12.4	12.4	12.4	11.8	<b>12.4</b>	12.4	12.2	11.8	<b>12.1</b>	<b>12.2</b>
9.	RKD 280	N-4-09	11.8	12.6	12.6	11.4	<b>12.1</b>	12.6	12.1	11.6	11.2	12.8	<b>12.1</b>	12.6	12.0	12.8	<b>12.5</b>	<b>12.2</b>
10.	HI 8757	N-4-10	12.4	11.2	11.8	11.2	<b>11.7</b>	12.8	13.1	13.0	12.0	12.6	<b>12.7</b>	13.0	12.8	13.0	<b>12.9</b>	<b>12.4</b>
11.	MPO1302	N-4-11	12.8	12.8	12.4	12.8	<b>12.7</b>	11.4	12.8	12.8	12.2	13.0	<b>12.4</b>	13.2	12.6	12.8	<b>12.9</b>	<b>12.6</b>
12.	UAS 453	N-4-12	12.8	12.2	12.0	12.4	<b>12.4</b>	11.8	11.8	11.2	11.4	12.0	<b>11.6</b>	12.8	12.6	12.4	<b>12.6</b>	<b>12.1</b>
13.	HI 8758	N-4-13	11.2	11.8	10.4	12.6	<b>11.5</b>	12.2	12.6	12.4	12.6	12.2	<b>12.4</b>	11.8	11.6	11.0	<b>11.5</b>	<b>11.9</b>
14.	RKD 279	N-4-14	12.8	13.0	12.8	12.8	<b>12.9</b>	11.4	13.0	12.6	13.2	12.8	<b>12.6</b>	12.8	12.2	12.8	<b>12.6</b>	<b>12.7</b>
15.	PBND5128	N-4-15	12.6	12.8	13.0	12.6	<b>12.8</b>	11.6	11.6	12.4	12.8	12.4	<b>12.2</b>	13.0	12.8	12.8	<b>12.9</b>	<b>12.5</b>
16.	NIDW 841	N-4-16	11.2	11.6	11.4	11.4	<b>11.4</b>	11.8	12.6	12.6	11.8	11.6	<b>12.1</b>	12.6	12.4	12.0	<b>12.3</b>	<b>11.9</b>
17.	NIDW 842	N-4-17	12.1	11.4	11.6	11.0	<b>11.5</b>	11.8	12.8	12.4	11.4	12.6	<b>12.2</b>	12.8	12.6	12.2	<b>12.5</b>	<b>12.1</b>
18.	HI 8760	N-4-18	13.2	12.8	12.2	12.8	<b>12.8</b>	11.2	12.4	12.6	12.8	11.6	<b>12.1</b>	12.1	13.0	13.0	<b>12.7</b>	<b>12.5</b>
19.	HD 4732	N-4-19	12.1	12.6	10.6	11.0	<b>11.6</b>	12.8	12.6	11.0	11.2	11.4	<b>11.8</b>	12.8	12.2	11.8	<b>12.3</b>	<b>11.8</b>
20.	UPD 96	N-4-20	12.0	12.8	12.8	12.8	<b>12.6</b>	11.2	12.2	12.6	12.8	12.2	<b>12.2</b>	12.6	13.0	12.8	<b>12.8</b>	<b>12.5</b>
21.	PDW 342	N-4-21	13.0	12.6	12.4	12.8	<b>12.7</b>	12.8	11.4	12.8	12.6	12.8	<b>12.5</b>	13.0	12.8	13.2	<b>13.0</b>	<b>12.7</b>
22.	HD 4731	N-4-22	12.8	12.2	12.8	12.8	<b>12.7</b>	12.8	12.3	11.8	12.2	11.6	<b>12.1</b>	12.8	12.6	11.8	<b>12.4</b>	<b>12.4</b>
23.	GW 1311	N-4-23	12.8	11.4	12.6	12.8	<b>12.4</b>	11.0	11.1	12.6	11.8	11.8	<b>11.7</b>	12.0	12.8	12.6	<b>12.5</b>	<b>12.1</b>
24.	HI 8498 (C)	N-4-24	12.8	11.8	12.0	11.8	<b>12.1</b>	11.4	12.4	12.6	12.4	12.0	<b>12.2</b>	12.0	12.8	12.4	<b>12.4</b>	<b>12.2</b>
25.	HD 2967 (C)	N-4-25	12.2	12.4	11.8	12.0	<b>12.1</b>	11.8	12.2	12.6	12.8	12.2	<b>12.3</b>	12.6	12.8	12.0	<b>12.5</b>	<b>12.3</b>
26.	MACS 4024	N-4-26	11.2	11.6	11.6	11.8	<b>11.6</b>	13.2	12.6	12.8	11.6	13.0	<b>12.6</b>	12.6	12.8	13.0	<b>12.8</b>	<b>12.3</b>
27.	DDW 31	N-4-27	12.8	12.2	12.2	11.6	<b>12.2</b>	11.8	12.1	12.0	12.2	12.2	<b>12.1</b>	12.0	12.8	12.2	<b>12.3</b>	<b>12.2</b>
28.	GW 1308	N-4-28	12.8	12.4	12.0	11.0	<b>12.1</b>	11.2	11.6	11.8	11.6	11.8	<b>11.6</b>	11.8	12.0	11.6	<b>11.8</b>	<b>11.8</b>
29.	MACS 3949	N-4-29	12.2	11.6	11.8	11.8	<b>11.9</b>	11.0	12.2	12.8	11.0	12.0	<b>11.8</b>	12.8	12.6	13.0	<b>12.8</b>	<b>12.1</b>
30.	WHD 956	N-4-30	13.0	12.8	11.8	12.6	<b>12.6</b>	12.8	12.4	11.8	12.4	11.6	<b>12.2</b>	12.8	12.8	13.0	<b>12.9</b>	<b>12.5</b>
31.	NIDW 295 (C)	N-4-31	11.6	12.2	12.0	12.0	<b>12.0</b>	12.6	12.6	12.2	11.8	12.4	<b>12.3</b>	12.0	11.8	12.6	<b>12.1</b>	<b>12.2</b>
32.	DDW 32	N-4-32	11.2	11.8	11.4	11.6	<b>11.5</b>	11.4	12.4	11.0	12.2	11.8	<b>11.8</b>	12.8	12.6	12.0	<b>12.5</b>	<b>11.9</b>
33.	GW 1309	N-4-33	12.2	12.6	11.4	11.4	<b>11.9</b>	11.2	11.8	11.4	11.2	11.0	<b>11.3</b>	12.4	12.2	12.4	<b>12.3</b>	<b>11.8</b>
34.	PDW 314 (C)	N-4-34	12.4	11.8	12.6	11.8	<b>12.2</b>	11.8	12.4	12.6	12.6	12.4	<b>12.4</b>	12.8	12.0	12.2	<b>12.3</b>	<b>12.3</b>
35.	MPO 1301	N-4-35	11.8	12.2	11.4	12.0	<b>11.9</b>	12.8	12.6	12.8	12.6	12.8	<b>12.7</b>	12.6	12.2	11.8	<b>12.2</b>	<b>12.3</b>
36.	MACS 4023	N-4-36	12.4	11.4	11.6	12.4	<b>12.0</b>	13.0	12.4	11.6	12.4	12.4	<b>12.4</b>	12.8	12.4	12.0	<b>12.4</b>	<b>12.2</b>
	<b>Mean</b>		<b>12.1</b>	<b>12.1</b>	<b>11.9</b>	<b>11.9</b>	<b>12.0</b>	<b>12.0</b>	<b>12.2</b>	<b>12.2</b>	<b>12.1</b>	<b>12.1</b>	<b>12.1</b>	<b>12.5</b>	<b>12.4</b>	<b>12.4</b>	<b>12.4</b>	<b>12.2</b>

**Table 22: Sedimentation value (ml) of *Triticum durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagath	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	36	30	26	30	<b>31</b>	23	42	37	30	32	<b>33</b>	41	27	36	<b>35</b>	<b>33</b>
2.	WHD 955	N-4-02	42	38	32	35	<b>37</b>	20	46	48	30	40	<b>37</b>	40	30	31	<b>34</b>	<b>36</b>
3.	PDW 339	N-4-03	30	33	28	34	<b>31</b>	30	45	47	26	28	<b>35</b>	40	29	27	<b>32</b>	<b>33</b>
4.	GW 1310	N-4-04	40	36	27	35	<b>35</b>	25	45	39	28	30	<b>33</b>	42	32	29	<b>34</b>	<b>34</b>
5.	HI 8759	N-4-05	40	39	30	30	<b>35</b>	24	43	40	35	38	<b>36</b>	50	30	38	<b>39</b>	<b>36</b>
6.	PDW 340	N-4-06	32	37	29	30	<b>32</b>	26	41	35	29	40	<b>34</b>	46	30	37	<b>38</b>	<b>34</b>
7.	HI 8761	N-4-07	38	40	31	40	<b>37</b>	27	45	27	30	36	<b>33</b>	37	32	26	<b>32</b>	<b>34</b>
8.	UAS 452	N-4-08	40	42	26	36	<b>36</b>	30	44	43	36	41	<b>39</b>	42	40	25	<b>36</b>	<b>37</b>
9.	RKD 280	N-4-09	36	37	28	28	<b>32</b>	27	40	38	25	32	<b>32</b>	46	38	22	<b>35</b>	<b>33</b>
10.	HI 8757	N-4-10	43	40	28	42	<b>38</b>	30	32	42	40	37	<b>36</b>	45	30	27	<b>34</b>	<b>36</b>
11.	MPO1302	N-4-11	36	45	30	36	<b>37</b>	20	36	40	32	41	<b>34</b>	40	35	28	<b>34</b>	<b>35</b>
12.	UAS 453	N-4-12	38	40	35	32	<b>36</b>	27	42	40	35	40	<b>37</b>	37	40	30	<b>36</b>	<b>36</b>
13.	HI 8758	N-4-13	40	46	30	35	<b>38</b>	32	35	38	30	33	<b>34</b>	28	30	25	<b>28</b>	<b>34</b>
14.	RKD 279	N-4-14	37	43	30	38	<b>37</b>	29	40	43	32	30	<b>35</b>	41	39	37	<b>39</b>	<b>37</b>
15.	PBND5128	N-4-15	38	45	29	30	<b>36</b>	30	36	40	29	38	<b>35</b>	42	32	30	<b>35</b>	<b>35</b>
16.	NIDW 841	N-4-16	46	40	32	35	<b>38</b>	35	40	45	30	34	<b>37</b>	30	40	29	<b>33</b>	<b>36</b>
17.	NIDW 842	N-4-17	37	35	35	38	<b>36</b>	27	40	40	34	38	<b>36</b>	35	30	30	<b>32</b>	<b>35</b>
18.	HI 8760	N-4-18	38	47	32	40	<b>39</b>	30	40	45	38	35	<b>38</b>	43	35	35	<b>38</b>	<b>38</b>
19.	HD 4732	N-4-19	42	45	30	38	<b>39</b>	32	40	43	38	41	<b>39</b>	42	37	28	<b>36</b>	<b>38</b>
20.	UPD 96	N-4-20	25	25	20	22	<b>23</b>	22	26	40	21	20	<b>26</b>	37	27	36	<b>33</b>	<b>27</b>
21.	PDW 342	N-4-21	41	47	30	38	<b>39</b>	27	32	36	32	39	<b>33</b>	40	33	53	<b>42</b>	<b>37</b>
22.	HD 4731	N-4-22	36	46	28	33	<b>36</b>	22	35	40	34	41	<b>34</b>	42	32	35	<b>36</b>	<b>35</b>
23.	GW 1311	N-4-23	32	20	30	20	<b>26</b>	20	30	33	20	31	<b>27</b>	29	27	28	<b>28</b>	<b>27</b>
24.	HI 8498 (C)	N-4-24	40	43	36	37	<b>39</b>	30	37	45	36	38	<b>37</b>	44	38	43	<b>42</b>	<b>39</b>
25.	HD 2967 (C)	N-4-25	41	40	38	36	<b>39</b>	40	38	42	38	39	<b>39</b>	40	42	43	<b>42</b>	<b>40</b>
26.	MACS 4024	N-4-26	40	37	37	30	<b>36</b>	26	38	40	35	38	<b>35</b>	32	40	35	<b>36</b>	<b>36</b>
27.	DDW 31	N-4-27	45	40	32	43	<b>40</b>	30	35	43	38	37	<b>37</b>	45	40	40	<b>42</b>	<b>39</b>
28.	GW 1308	N-4-28	25	20	20	20	<b>21</b>	19	30	32	28	22	<b>26</b>	50	25	30	<b>35</b>	<b>27</b>
29.	MACS 3949	N-4-29	46	48	27	49	<b>43</b>	30	38	44	35	34	<b>36</b>	44	45	35	<b>41</b>	<b>40</b>
30.	WHD 956	N-4-30	35	40	25	31	<b>33</b>	22	37	40	36	42	<b>35</b>	36	36	28	<b>33</b>	<b>34</b>
31.	NIDW 295 (C)	N-4-31	42	42	38	38	<b>40</b>	37	40	42	39	34	<b>38</b>	40	40	36	<b>39</b>	<b>39</b>
32.	DDW 32	N-4-32	43	45	27	33	<b>37</b>	27	40	46	38	22	<b>35</b>	41	42	29	<b>37</b>	<b>36</b>
33.	GW 1309	N-4-33	20	21	22	21	<b>21</b>	22	23	28	20	27	<b>24</b>	43	28	26	<b>32</b>	<b>25</b>
34.	PDW 314 (C)	N-4-34	39	40	35	40	<b>39</b>	30	38	35	26	29	<b>32</b>	42	39	37	<b>39</b>	<b>36</b>
35.	MPO 1301	N-4-35	42	50	24	37	<b>38</b>	30	40	39	39	40	<b>38</b>	36	38	50	<b>41</b>	<b>39</b>
36.	MACS 4023	N-4-36	34	45	27	35	<b>35</b>	26	38	40	30	32	<b>33</b>	42	32	32	<b>35</b>	<b>34</b>
	<b>Mean</b>		<b>38</b>	<b>39</b>	<b>30</b>	<b>34</b>	<b>35</b>	<b>27</b>	<b>38</b>	<b>40</b>	<b>32</b>	<b>35</b>	<b>34</b>	<b>40</b>	<b>34</b>	<b>33</b>	<b>36</b>	<b>35</b>

**Table 23: Yellow berry incidence of *T. durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagarh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	2.1	1.2	10.4	3.2	<b>4.2</b>	1.0	1.2	0.0	1.2	0.0	<b>0.7</b>	0.0	23.0	3.2	<b>8.7</b>	<b>3.9</b>
2.	WHD 955	N-4-02	1.8	0.0	0.0	15.3	<b>4.3</b>	9.3	2.4	12.3	0.0	3.1	<b>5.4</b>	1.2	3.0	6.3	<b>3.5</b>	<b>4.6</b>
3.	PDW 339	N-4-03	2.3	0.0	0.0	0.0	<b>0.6</b>	44.3	0.0	4.3	2.1	1.0	<b>10.3</b>	1.0	1.0	1.0	<b>1.0</b>	<b>4.8</b>
4.	GW 1310	N-4-04	4.0	2.3	5.3	3.4	<b>3.8</b>	19.4	1.3	0.0	0.0	0.0	<b>4.1</b>	0.0	0.0	4.3	<b>1.4</b>	<b>3.3</b>
5.	HI 8759	N-4-05	5.2	5.1	0.0	5.7	<b>5.3</b>	14.2	1.4	3.2	2.4	0.0	<b>4.2</b>	1.0	6.2	9.4	<b>5.5</b>	<b>4.9</b>
6.	PDW 340	N-4-06	3.3	9.2	9.4	4.2	<b>6.5</b>	52.1	0.0	1.3	0.0	1.2	<b>10.9</b>	1.3	1.0	3.4	<b>1.9</b>	<b>7.2</b>
7.	HI 8761	N-4-07	7.4	15.4	19.3	1.0	<b>10.8</b>	41.3	1.3	0.0	0.0	4.2	<b>11.7</b>	1.4	6.3	18.2	<b>8.6</b>	<b>10.5</b>
8.	UAS 452	N-4-08	5.8	2.1	2.3	2.1	<b>3.1</b>	18.2	4.2	15.2	4.3	3.2	<b>9.0</b>	0.0	0.0	14.3	<b>4.8</b>	<b>6.0</b>
9.	RKD 280	N-4-09	7.3	2.3	7.6	19.3	<b>9.1</b>	40.1	1.3	0.0	0.0	1.2	<b>8.5</b>	0.0	1.0	0.0	<b>0.3</b>	<b>6.7</b>
10.	HI 8757	N-4-10	9.2	17.5	16.4	11.4	<b>13.6</b>	31.2	4.1	1.4	4.3	20.3	<b>12.3</b>	9.4	2.0	9.3	<b>6.9</b>	<b>11.4</b>
11.	MPO1302	N-4-11	8.4	1.3	9.4	10.4	<b>7.4</b>	43.0	4.4	3.4	1.4	0.0	<b>10.4</b>	2.3	2.1	4.2	<b>2.9</b>	<b>7.5</b>
12.	UAS 453	N-4-12	12.4	14.4	15.3	16.3	<b>14.6</b>	21.2	0.0	7.3	9.5	15.2	<b>13.3</b>	3.2	3.4	4.1	<b>3.6</b>	<b>11.1</b>
13.	HI 8758	N-4-13	4.2	1.3	1.1	13.4	<b>5.0</b>	19.2	0.0	5.2	8.3	8.2	<b>10.2</b>	0.0	9.3	20.0	<b>9.8</b>	<b>8.2</b>
14.	RKD 279	N-4-14	0.0	6.5	0.0	1.3	<b>2.0</b>	32.3	0.0	3.4	1.3	0.0	<b>7.4</b>	1.3	0.0	0.0	<b>0.4</b>	<b>3.8</b>
15.	PBND5128	N-4-15	3.8	0.0	4.3	24.5	<b>8.2</b>	16.3	1.2	3.0	0.0	1.0	<b>4.3</b>	3.2	0.0	0.0	<b>1.1</b>	<b>4.8</b>
16.	NIDW 841	N-4-16	7.6	4.3	11.3	6.3	<b>7.4</b>	22.3	1.3	0.0	0.0	0.0	<b>4.7</b>	1.0	3.2	4.3	<b>2.8</b>	<b>5.1</b>
17.	NIDW 842	N-4-17	0.0	12.4	14.0	13.2	<b>9.9</b>	27.5	3.1	1.4	0.0	0.0	<b>6.4</b>	1.0	1.0	6.3	<b>2.8</b>	<b>6.7</b>
18.	HI 8760	N-4-18	1.3	0.0	4.3	6.3	<b>3.0</b>	21.2	0.0	1.3	2.1	2.4	<b>5.4</b>	3.2	1.3	2.0	<b>2.2</b>	<b>3.8</b>
19.	HD 4732	N-4-19	1.4	1.3	2.4	10.3	<b>3.9</b>	18.6	1.3	11.4	3.4	1.0	<b>7.1</b>	11.2	1.3	2.4	<b>5.0</b>	<b>5.5</b>
20.	UPD 96	N-4-20	10.3	4.3	12.4	10.2	<b>9.3</b>	12.2	0.0	2.0	12.0	0.0	<b>5.2</b>	16.0	2.3	4.5	<b>7.6</b>	<b>7.2</b>
21.	PDW 342	N-4-21	3.4	6.1	9.8	15.4	<b>8.7</b>	22.3	4.9	1.0	9.3	13.2	<b>10.1</b>	2.0	6.7	6.9	<b>5.2</b>	<b>8.4</b>
22.	HD 4731	N-4-22	5.7	5.9	1.0	18.0	<b>7.7</b>	10.4	1.3	6.4	6.1	1.0	<b>5.0</b>	3.2	13.0	32.6	<b>16.3</b>	<b>8.7</b>
23.	GW 1311	N-4-23	7.1	1.3	3.1	21.3	<b>8.2</b>	24.3	4.9	9.4	3.2	0.0	<b>8.4</b>	6.5	0.0	7.9	<b>4.8</b>	<b>7.4</b>
24.	HI 8498 (C)	N-4-24	3.2	3.7	6.2	0.4	<b>3.4</b>	5.7	2.1	0.0	10.0	0.0	<b>3.6</b>	0.0	8.4	10.4	<b>6.3</b>	<b>4.2</b>
25.	HD 2967 (C)	N-4-25	1.3	2.4	14.1	11.6	<b>7.4</b>	1.3	9.2	12.4	12.3	0.0	<b>7.0</b>	11.0	3.2	4.3	<b>6.2</b>	<b>6.9</b>
26.	MACS 4024	N-4-26	11.4	10.2	16.3	22.3	<b>15.1</b>	9.4	3.4	5.3	27.1	4.9	<b>10.0</b>	9.0	2.3	13.4	<b>8.2</b>	<b>11.3</b>
27.	DDW 31	N-4-27	9.3	15.4	19.1	2.0	<b>11.5</b>	23.3	1.6	1.2	13.4	12.2	<b>10.3</b>	6.7	3.2	1.0	<b>3.6</b>	<b>9.0</b>
28.	GW 1308	N-4-28	17.2	12.4	13.2	2.7	<b>11.4</b>	47.2	1.7	4.5	12.6	11.3	<b>15.5</b>	23.0	2.0	18.0	<b>14.3</b>	<b>13.8</b>
29.	MACS 3949	N-4-29	0.0	1.2	9.2	9.2	<b>4.9</b>	18.4	3.3	6.2	1.3	2.1	<b>6.3</b>	22.0	4.0	4.0	<b>10.0</b>	<b>6.7</b>
30.	WHD 956	N-4-30	12.1	5.4	29.3	27.3	<b>18.5</b>	61.4	2.0	4.3	1.0	0.0	<b>13.7</b>	0.0	2.0	4.3	<b>2.1</b>	<b>12.4</b>
31.	NIDW 295 (C)	N-4-31	6.4	0.0	10.3	11.9	<b>7.2</b>	8.3	0.0	8.4	1.4	0.0	<b>3.6</b>	4.3	9.4	11.5	<b>8.4</b>	<b>6.0</b>
32.	DDW 32	N-4-32	15.2	5.3	5.9	21.2	<b>11.9</b>	21.2	3.1	2.3	10.3	0.0	<b>7.4</b>	3.2	1.3	9.2	<b>4.6</b>	<b>8.2</b>
33.	GW 1309	N-4-33	1.4	11.4	5.2	41.3	<b>14.8</b>	40.3	3.1	2.7	31.4	0.0	<b>15.5</b>	42.3	6.3	1.3	<b>16.6</b>	<b>15.6</b>
34.	PDW 314 (C)	N-4-34	2.1	3.4	14.3	2.0	<b>5.5</b>	9.4	2.3	3.4	10.2	0.0	<b>5.1</b>	7.3	2.1	2.3	<b>3.9</b>	<b>4.9</b>
35.	MPO 1301	N-4-35	5.3	1.3	16.2	15.3	<b>9.5</b>	52.3	4.1	2.3	18.1	0.0	<b>15.4</b>	6.3	1.4	3.2	<b>3.6</b>	<b>10.5</b>
36.	MACS 4023	N-4-36	6.1	3.3	17.1	2.1	<b>7.2</b>	34.9	3.4	4.1	31.3	1.2	<b>15.0</b>	4.5	1.2	3.4	<b>3.0</b>	<b>9.4</b>
	<b>Mean</b>		<b>5.7</b>	<b>5.3</b>	<b>9.6</b>	<b>11.2</b>	<b>7.9</b>	<b>24.9</b>	<b>2.3</b>	<b>4.3</b>	<b>7.0</b>	<b>3.0</b>	<b>8.4</b>	<b>5.8</b>	<b>3.7</b>	<b>7.0</b>	<b>5.5</b>	<b>7.5</b>



**Table 24: Yellow pigment (ppm) of *T. durum* genotypes in NIVT-4**

Sr. No	Entry	Trial Code	NWPZ					CZ					PZ				Overall Mean	
			Delhi	Durgapura	Hisar	Ludhiana	Mean	Indore	Junagarh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune		Mean
1.	PDW 341	N-4-01	5.2	5.0	7.9	6.2	<b>6.1</b>	4.2	4.0	6.9	7.8	6.4	<b>5.9</b>	5.3	5.5	5.2	<b>5.3</b>	<b>5.8</b>
2.	WHD 955	N-4-02	5.3	5.5	8.9	7.2	<b>6.7</b>	5.7	5.9	6.1	5.0	6.9	<b>5.9</b>	5.5	5.3	6.0	<b>5.6</b>	<b>6.1</b>
3.	PDW 339	N-4-03	3.6	4.9	7.8	7.8	<b>6.0</b>	4.5	3.5	4.5	7.6	5.3	<b>5.1</b>	4.2	4.4	5.3	<b>4.6</b>	<b>5.3</b>
4	GW 1310	N-4-04	3.6	4.8	5.5	5.5	<b>4.9</b>	5.6	3.7	6.1	7.1	6.6	<b>5.8</b>	5.1	4.2	6.5	<b>5.3</b>	<b>5.4</b>
5.	HI 8759	N-4-05	4.5	5.1	5.4	7.3	<b>5.6</b>	4.9	3.5	7.0	4.7	5.0	<b>5.0</b>	4.2	6.4	5.4	<b>5.3</b>	<b>5.3</b>
6.	PDW 340	N-4-06	5.6	5.0	4.4	5.4	<b>5.1</b>	5.8	5.5	5.5	6.4	5.6	<b>5.8</b>	4.7	4.4	6.2	<b>5.1</b>	<b>5.4</b>
7.	HI 8761	N-4-07	4.3	4.0	6.3	6.3	<b>5.2</b>	6.1	4.2	5.1	6.2	4.4	<b>5.2</b>	4.1	4.6	3.3	<b>4.0</b>	<b>4.9</b>
8.	UAS 452	N-4-08	7.5	6.9	6.4	6.4	<b>6.8</b>	6.4	4.2	7.9	6.4	5.6	<b>6.1</b>	4.4	4.0	5.9	<b>4.8</b>	<b>6.0</b>
9.	RKD 280	N-4-09	3.3	4.7	6.5	6.5	<b>5.3</b>	4.8	3.2	4.7	4.1	5.1	<b>4.4</b>	4.6	4.5	5.8	<b>5.0</b>	<b>4.8</b>
10.	HI 8757	N-4-10	4.2	4.6	7.9	6.0	<b>5.7</b>	5.7	5.4	6.2	7.2	5.2	<b>5.9</b>	4.4	4.4	6.5	<b>5.1</b>	<b>5.6</b>
11.	MPO1302	N-4-11	4.8	4.2	7.5	6.0	<b>5.6</b>	5.4	4.5	4.5	7.6	6.8	<b>5.8</b>	5.5	5.8	6.1	<b>5.8</b>	<b>5.7</b>
12.	UAS 453	N-4-12	4.2	6.5	6.6	7.9	<b>6.3</b>	6.7	5.6	5.2	6.1	6.3	<b>6.0</b>	4.2	4.0	3.1	<b>3.8</b>	<b>5.5</b>
13.	HI 8758	N-4-13	4.5	5.2	5.5	7.0	<b>5.6</b>	6.2	4.8	5.2	6.2	7.6	<b>6.0</b>	4.5	4.2	6.1	<b>4.9</b>	<b>5.6</b>
14.	RKD 279	N-4-14	4.4	4.9	5.5	6.5	<b>5.3</b>	4.6	4.0	4.3	5.5	6.5	<b>5.0</b>	4.6	5.0	4.7	<b>4.8</b>	<b>5.0</b>
15.	PBND5128	N-4-15	4.7	5.1	6.2	7.0	<b>5.8</b>	6.3	5.2	6.8	5.6	5.3	<b>5.8</b>	4.5	4.4	4.4	<b>4.4</b>	<b>5.5</b>
16.	NIDW 841	N-4-16	5.6	5.3	6.2	7.9	<b>6.3</b>	5.9	5.7	5.0	6.3	5.4	<b>5.7</b>	4.0	4.0	5.9	<b>4.6</b>	<b>5.6</b>
17.	NIDW 842	N-4-17	5.3	5.6	7.2	9.3	<b>6.9</b>	3.7	3.2	6.4	6.0	5.7	<b>5.0</b>	5.4	5.2	6.2	<b>5.6</b>	<b>5.8</b>
18.	HI 8760	N-4-18	4.3	4.1	4.4	6.6	<b>4.9</b>	6.4	6.0	5.5	4.4	9.8	<b>6.4</b>	4.5	5.3	3.5	<b>4.4</b>	<b>5.4</b>
19.	HD 4732	N-4-19	6.5	7.3	6.4	6.2	<b>6.6</b>	4.7	5.4	6.9	5.5	8.3	<b>6.2</b>	4.0	5.2	5.4	<b>4.9</b>	<b>6.0</b>
20.	UPD 96	N-4-20	6.3	6.8	6.2	7.7	<b>6.8</b>	5.8	5.5	6.4	5.2	6.2	<b>5.8</b>	5.4	4.4	6.8	<b>5.5</b>	<b>6.1</b>
21.	PDW 342	N-4-21	4.7	5.4	6.2	8.1	<b>6.1</b>	7.3	4.2	3.6	6.2	7.4	<b>5.7</b>	4.5	5.6	6.9	<b>5.7</b>	<b>5.8</b>
22.	HD 4731	N-4-22	4.2	5.4	6.1	6.2	<b>5.5</b>	6.0	4.3	5.5	6.1	5.3	<b>5.4</b>	5.2	5.3	4.1	<b>4.9</b>	<b>5.3</b>
23.	GW 1311	N-4-23	4.1	5.0	6.5	7.8	<b>5.9</b>	4.7	3.9	5.0	6.5	5.2	<b>5.1</b>	5.5	4.1	5.4	<b>5.0</b>	<b>5.3</b>
24.	HI 8498 (C)	N-4-24	5.0	5.1	6.1	6.3	<b>5.6</b>	3.6	5.7	6.3	5.4	5.3	<b>5.3</b>	6.7	5.6	5.0	<b>5.8</b>	<b>5.5</b>
25.	HD 2967 (C)	N-4-25	3.4	3.6	3.5	3.1	<b>3.4</b>	3.6	3.5	3.4	3.3	3.1	<b>3.4</b>	3.2	3.3	3.4	<b>3.3</b>	<b>3.4</b>
26.	MACS 4024	N-4-26	5.9	5.7	7.9	7.0	<b>6.6</b>	6.3	5.2	5.4	7.2	6.4	<b>6.1</b>	5.6	4.5	5.8	<b>5.3</b>	<b>6.1</b>
27.	DDW 31	N-4-27	5.1	5.2	4.5	5.4	<b>5.1</b>	5.8	5.2	5.6	5.2	6.1	<b>5.6</b>	5.0	5.2	5.1	<b>5.1</b>	<b>5.3</b>
28.	GW 1308	N-4-28	4.5	3.6	5.8	5.4	<b>4.8</b>	4.9	3.1	5.0	5.5	7.4	<b>5.2</b>	5.5	4.1	5.8	<b>5.1</b>	<b>5.1</b>
29.	MACS 3949	N-4-29	6.3	6.9	6.3	6.5	<b>6.5</b>	6.7	5.2	7.2	6.0	4.5	<b>5.9</b>	6.6	4.8	5.5	<b>5.6</b>	<b>6.0</b>
30.	WHD 956	N-4-30	5.3	6.0	5.1	7.2	<b>5.9</b>	6.9	7.9	5.2	6.1	5.5	<b>6.3</b>	6.0	5.8	6.3	<b>6.0</b>	<b>6.1</b>
31.	NIDW 295 (C)	N-4-31	6.6	6.0	6.4	6.1	<b>6.3</b>	5.8	5.3	5.6	6.1	8.1	<b>6.2</b>	6.4	6.0	5.2	<b>5.9</b>	<b>6.1</b>
32.	DDW 32	N-4-32	5.3	5.0	5.2	7.2	<b>5.7</b>	6.3	5.2	5.6	6.7	5.7	<b>5.9</b>	5.2	5.1	5.5	<b>5.3</b>	<b>5.7</b>
33.	GW 1309	N-4-33	5.3	6.6	6.3	6.4	<b>6.2</b>	5.8	5.1	5.1	6.3	6.9	<b>5.8</b>	5.1	5.7	5.8	<b>5.5</b>	<b>5.9</b>
34.	PDW 314 (C)	N-4-34	6.6	5.3	6.1	6.6	<b>6.2</b>	6.2	5.2	5.4	5.4	6.3	<b>5.7</b>	5.2	5.1	5.3	<b>5.2</b>	<b>5.7</b>
35.	MPO 1301	N-4-35	5.6	5.6	6.2	7.9	<b>6.3</b>	4.5	3.4	4.4	5.0	5.1	<b>4.5</b>	5.1	4.2	4.4	<b>4.6</b>	<b>5.1</b>
36.	MACS 4023	N-4-36	5.3	3.4	7.8	7.5	<b>6.0</b>	6.8	4.2	6.4	5.9	6.4	<b>5.9</b>	4.8	5.3	5.5	<b>5.2</b>	<b>5.8</b>
	<b>Mean</b>		<b>5.0</b>	<b>5.3</b>	<b>6.2</b>	<b>6.7</b>	<b>5.8</b>	<b>5.6</b>	<b>4.7</b>	<b>5.6</b>	<b>5.9</b>	<b>6.1</b>	<b>5.6</b>	<b>5.0</b>	<b>4.9</b>	<b>5.4</b>	<b>5.1</b>	<b>5.5</b>

### **NIVT-5A (Rainfed Timely Sown)**

Thirty six entries including 4 checks were evaluated for different quality traits from 9 centres representing NWPZ, NEPZ, CZ and PZ under rain fed timely sown condition. Grain appearance score varied from 4.2 (NI 5439) to 6.7 (CG 1012). Entries namely UP 2887, K 1316, CG 1012, K 1317 and MACS 6607 were found to demonstrate mean grain appearance score of 6.1-6.2. Among zones, entries from PZ recorded highest mean grain appearance score (6.1) followed by CZ (5.9) and NEPZ (5.9). The overall test weight varied from 52.3 (NI 5439) to 84.0 kg/hl (PBW 720). Performance of entry UP 2887 was excellent as it recorded highest mean hectoliter weight (80.4 kg/hl). Among zones, entries from PZ recorded maximum hectoliter weight (79.7kg/hl) followed by CZ (79.4) and NEPZ (78.7). The overall protein content ranged 8.1 to 15.2% (JAUW 621). Among the centres, the performance of all the entries and checks was much better at Pune, where the protein content recorded an average value of 13.9 %. Sedimentation value varied from 30 ml (UAS 365) to maximum value of 63 ml (WH 1080). Zone wise, PZ showed highest sedimentation value (51ml). In phenol test, the entries which made excellent chapatti invariably developed very light brown color. Performance of NIAW 2325 was best as it developed very light brown color. Other entries namely MP 1290, K 1315, HI 1605, K 1317, and HD 2888 also developed light brown color.

### **NIVT - 5A (Restricted Irrigation Timely Sown)**

Thirty six entries including 4 checks were evaluated for different quality traits from 9 centres representing NWPZ, NEPZ, CZ and PZ under rain fed timely sown condition. The same set of entries as mentioned above received from two locations namely Indore and Kota were analyzed. Comparative performance of NIVT-5A Rainfed & Restricted Irrigation entries revealed that entries of restricted irrigation recorded slightly higher grain appearance score and sedimentation value.

Table 25: Grain appearance score (Max. 10) of *T.aestivum* genotypes in NIVT-5A

(Rainfed Timely Sown)

Sr. No	Entry	Trial Code	NWPZ			NEPZ				CZ	PZ				Overall Mean
			Ludhiana	Delhi	Mean	Kanpur	Pusa	Sabour	Mean	Kota	Pune	Niphad	Dharwad	Mean	
1.	HD 3171	N-5A-01	6.2	5.6	<b>5.9</b>	6.1	6.4	5.9	<b>6.1</b>	5.9	6.3	5.9	6.5	<b>6.2</b>	<b>6.0</b>
2.	UP 2887	N-5A-02	6.0	6.0	<b>6.0</b>	5.7	5.9	5.9	<b>5.8</b>	6.0	5.6	5.9	6.3	<b>5.9</b>	<b>5.9</b>
3.	HD 3174	N-5A-03	5.9	5.6	<b>5.8</b>	6.0	6.0	6.2	<b>6.1</b>	5.8	6.3	5.8	6.4	<b>6.2</b>	<b>5.9</b>
4.	MP 1290	N-5A-04	4.9	5.6	<b>5.3</b>	6.4	5.7	6.4	<b>6.2</b>	6.3	6.2	6.3	6.5	<b>6.3</b>	<b>6.0</b>
5.	MP 3288 (c)	N-5A-05	5.5	4.9	<b>5.2</b>	5.7	5.7	5.8	<b>5.7</b>	5.4	5.4	5.5	6.0	<b>5.6</b>	<b>5.5</b>
6.	MP 1293	N-5A-06	4.8	5.8	<b>5.3</b>	5.7	5.8	5.9	<b>5.8</b>	6.2	6.3	5.7	5.9	<b>6.0</b>	<b>5.8</b>
7.	HUW 689	N-5A-07	4.0	5.6	<b>4.8</b>	5.5	5.2	5.8	<b>5.5</b>	5.7	5.9	5.8	6.2	<b>6.0</b>	<b>5.5</b>
8.	WH 1166	N-5A-08	5.7	5.5	<b>5.6</b>	5.8	5.7	5.8	<b>5.8</b>	5.6	5.9	6.4	6.3	<b>6.2</b>	<b>5.8</b>
9.	UP 2886	N-5A-09	5.8	5.9	<b>5.9</b>	5.8	5.8	6.2	<b>5.9</b>	5.8	6.2	5.8	6.6	<b>6.2</b>	<b>5.9</b>
10.	MACS 6648	N-5A-10	5.4	5.7	<b>5.6</b>	5.7	5.6	5.7	<b>5.7</b>	5.7	5.4	6.0	6.1	<b>5.8</b>	<b>5.7</b>
11.	WH 1080 (c)	N-5A-11	5.8	5.7	<b>5.8</b>	5.6	5.8	5.8	<b>5.7</b>	5.9	6.7	6.0	6.0	<b>6.2</b>	<b>5.9</b>
12.	K 1316	N-5A-12	5.9	5.6	<b>5.8</b>	6.1	5.8	5.9	<b>5.9</b>	5.5	5.7	5.6	6.2	<b>5.8</b>	<b>5.8</b>
13.	CG 1012	N-5A-13	6.3	5.6	<b>6.0</b>	5.8	5.9	6.2	<b>6.0</b>	6.0	6.5	6.0	6.6	<b>6.4</b>	<b>6.1</b>
14.	UAS 365	N-5A-14	5.0	5.4	<b>5.2</b>	5.7	5.5	5.8	<b>5.7</b>	5.9	6.3	6.3	6.3	<b>6.3</b>	<b>5.8</b>
15.	K 1315	N-5A-15	4.0	5.6	<b>4.8</b>	6.0	6.0	6.2	<b>6.1</b>	5.9	6.4	6.0	6.3	<b>6.2</b>	<b>5.8</b>
16.	HI 1605	N-5A-16	5.7	5.5	<b>5.6</b>	6.0	6.0	5.8	<b>5.9</b>	6.2	6.3	5.9	6.2	<b>6.1</b>	<b>6.0</b>
17.	RAJ 4386	N-5A-17	6.0	5.5	<b>5.8</b>	5.9	5.7	6.2	<b>5.9</b>	5.9	5.9	6.4	6.1	<b>6.1</b>	<b>5.9</b>
18.	PBW 720	N-5A-18	6.0	5.6	<b>5.8</b>	6.3	5.9	6.3	<b>6.2</b>	6.1	6.7	5.8	6.4	<b>6.3</b>	<b>6.1</b>
19.	PBW 721	N-5A-19	5.9	5.5	<b>5.7</b>	6.3	6.0	6.0	<b>6.1</b>	5.9	6.3	6.0	6.5	<b>6.3</b>	<b>6.0</b>
20.	WH 1167	N-5A-20	6.0	5.8	<b>5.9</b>	5.9	5.9	6.0	<b>5.9</b>	5.8	5.5	5.8	6.5	<b>5.9</b>	<b>5.9</b>
21.	MP 3424	N-5A-21	5.9	5.7	<b>5.8</b>	6.0	6.0	6.1	<b>6.0</b>	5.5	5.9	5.9	6.0	<b>5.9</b>	<b>5.8</b>
22.	NIAW 2325	N-5A-22	5.9	5.7	<b>5.8</b>	5.9	5.9	6.2	<b>6.0</b>	6.0	5.9	6.0	6.8	<b>6.2</b>	<b>6.0</b>
23.	BRW 3753	N-5A-23	6.0	5.8	<b>5.9</b>	5.9	5.0	6.1	<b>5.7</b>	6.0	6.6	6.0	6.4	<b>6.3</b>	<b>6.0</b>
24.	MP 1291	N-5A-24	6.0	4.9	<b>5.5</b>	5.9	5.9	6.1	<b>6.0</b>	5.9	5.9	5.8	6.3	<b>6.0</b>	<b>5.8</b>
25.	HD 3173	N-5A-25	6.3	5.5	<b>5.9</b>	6.2	6.1	6.2	<b>6.2</b>	5.7	5.9	5.7	6.4	<b>6.0</b>	<b>5.9</b>
26.	NI 5439 (c)	N-5A-26	5.4	5.8	<b>5.6</b>	5.7	6.0	5.7	<b>5.8</b>	5.7	5.8	5.6	6.1	<b>5.8</b>	<b>5.7</b>
27.	JWS 712	N-5A-27	5.7	5.6	<b>5.7</b>	6.0	6.0	6.4	<b>6.1</b>	6.0	6.7	6.3	6.3	<b>6.4</b>	<b>6.1</b>
28.	DBW 153	N-5A-28	6.0	5.4	<b>5.7</b>	5.6	5.5	6.2	<b>5.8</b>	5.8	5.5	6.2	6.0	<b>5.9</b>	<b>5.8</b>
29.	K 1317	N-5A-29	5.5	5.8	<b>5.7</b>	6.1	5.9	6.3	<b>6.1</b>	6.0	6.6	6.2	6.6	<b>6.5</b>	<b>6.1</b>
30.	MACS 6607	N-5A-30	5.9	5.6	<b>5.8</b>	5.8	6.0	6.3	<b>6.0</b>	5.9	5.9	5.9	6.6	<b>6.1</b>	<b>6.0</b>
31.	NW 6035	N-5A-31	6.0	5.7	<b>5.9</b>	5.8	5.8	6.1	<b>5.9</b>	5.7	6.0	6.0	6.0	<b>6.0</b>	<b>5.9</b>
32.	HD 2888 (c)	N-5A-32	5.2	5.6	<b>5.4</b>	5.9	5.4	5.9	<b>5.7</b>	5.6	6.2	5.7	6.3	<b>6.1</b>	<b>5.7</b>
33.	DBW 152	N-5A-33	6.1	5.5	<b>5.8</b>	5.8	6.0	6.2	<b>6.0</b>	5.9	6.2	6.0	6.3	<b>6.2</b>	<b>6.0</b>
34.	HD 3172	N-5A-34	5.8	5.8	<b>5.8</b>	6.3	6.1	6.4	<b>6.3</b>	6.4	6.0	6.2	6.5	<b>6.2</b>	<b>6.2</b>
35.	MP 1292	N-5A-35	6.0	5.5	<b>5.8</b>	5.8	5.9	6.0	<b>5.9</b>	6.0	6.3	5.9	6.3	<b>6.2</b>	<b>6.0</b>
36.	JAUW 621	N-5A-36	6.3	5.5	<b>5.9</b>	6.0	5.8	6.2	<b>6.0</b>	5.8	6.3	6.0	6.1	<b>6.0</b>	<b>5.9</b>
	<b>Mean</b>		<b>5.7</b>	<b>5.6</b>	<b>5.6</b>	<b>5.9</b>	<b>5.8</b>	<b>6.1</b>	<b>5.9</b>	<b>5.9</b>	<b>6.1</b>	<b>5.9</b>	<b>6.3</b>	<b>6.1</b>	<b>5.9</b>

Table 26: Test weight (kg/hl) of *T.aestivum* genotypes in NIVT-5A

(Rainfed Timely Sown)

Sr. No	Entry	Trial Code	NWPZ			NEPZ				CZ	PZ				Overall Mean
			Ludhiana	Delhi	Mean	Kanpur	Pusa	Sabour	Mean	Kota	Pune	Niphad	Dharwad	Mean	
1.	HD 3171	N-5A-01	74.8	76.8	<b>75.8</b>	80.2	80.9	77.7	<b>79.6</b>	78.9	76.4	80.1	81.6	<b>79.4</b>	<b>78.4</b>
2.	UP 2887	N-5A-02	73.3	75.5	<b>74.4</b>	82.3	87.8	78.4	<b>82.8</b>	82.5	78.5	84.0	83.0	<b>81.8</b>	<b>80.4</b>
3.	HD 3174	N-5A-03	73.6	75.3	<b>74.5</b>	78.9	77.9	76.6	<b>77.8</b>	77.5	78.8	80.8	80.2	<b>80.0</b>	<b>77.4</b>
4.	MP 1290	N-5A-04	69.5	78.7	<b>74.1</b>	80.6	78.2	78.8	<b>79.2</b>	79.3	76.9	82.8	80.7	<b>80.2</b>	<b>78.2</b>
5.	MP 3288 (c)	N-5A-05	71.1	72.1	<b>71.6</b>	79.9	80.2	78.8	<b>79.6</b>	78.2	73.3	82.2	80.7	<b>78.7</b>	<b>77.0</b>
6.	MP 1293	N-5A-06	62.0	77.5	<b>69.8</b>	75.9	76.8	74.3	<b>75.7</b>	78.1	75.3	79.5	78.1	<b>77.6</b>	<b>75.3</b>
7.	HUW 689	N-5A-07	52.3	77.5	<b>64.9</b>	78.0	74.7	73.4	<b>75.4</b>	77.9	74.8	83.4	80.3	<b>79.5</b>	<b>74.4</b>
8.	WH 1166	N-5A-08	69.4	79.1	<b>74.3</b>	80.3	79.0	78.1	<b>79.1</b>	79.8	77.3	83.5	81.0	<b>80.6</b>	<b>78.4</b>
9.	UP 2886	N-5A-09	71.8	78.1	<b>75.0</b>	82.0	77.8	78.0	<b>79.3</b>	80.4	79.1	82.2	82.8	<b>81.3</b>	<b>79.0</b>
10.	MACS 6648	N-5A-10	67.9	75.6	<b>71.8</b>	75.9	76.2	75.9	<b>76.0</b>	76.3	72.3	79.9	77.8	<b>76.7</b>	<b>75.2</b>
11.	WH 1080 (c)	N-5A-11	72.5	78.3	<b>75.4</b>	79.1	79.6	75.7	<b>78.1</b>	79.4	79.4	80.9	78.7	<b>79.7</b>	<b>78.1</b>
12.	K 1316	N-5A-12	69.2	75.6	<b>72.4</b>	79.3	74.7	77.0	<b>77.0</b>	78.6	74.9	79.0	79.6	<b>77.8</b>	<b>76.5</b>
13.	CG 1012	N-5A-13	77.6	79.3	<b>78.5</b>	82.6	80.3	78.3	<b>80.4</b>	81.1	75.7	83.5	81.1	<b>80.1</b>	<b>80.0</b>
14.	UAS 365	N-5A-14	67.4	78.7	<b>73.1</b>	80.5	78.1	76.0	<b>78.2</b>	81.3	79.9	82.9	82.3	<b>81.7</b>	<b>78.6</b>
15.	K 1315	N-5A-15	56.5	72.6	<b>64.6</b>	79.2	78.4	76.6	<b>78.1</b>	79.1	78.6	81.8	78.7	<b>79.7</b>	<b>75.4</b>
16.	HI 1605	N-5A-16	73.4	77.6	<b>75.5</b>	80.2	77.4	78.2	<b>78.6</b>	80.8	79.7	82.0	80.5	<b>80.8</b>	<b>78.9</b>
17.	RAJ 4386	N-5A-17	74.2	73.8	<b>74.0</b>	80.8	79.3	77.2	<b>79.1</b>	80.5	78.1	82.4	79.8	<b>80.1</b>	<b>78.4</b>
18.	PBW 720	N-5A-18	74.4	72.5	<b>73.5</b>	81.0	78.9	79.4	<b>79.8</b>	79.8	80.6	83.5	80.5	<b>81.5</b>	<b>78.6</b>
19.	PBW 721	N-5A-19	71.4	77.1	<b>74.3</b>	81.4	81.8	76.8	<b>80.0</b>	81.0	78.5	80.5	81.2	<b>80.1</b>	<b>78.8</b>
20.	WH 1167	N-5A-20	75.8	76.2	<b>76.0</b>	80.6	80.4	78.1	<b>79.7</b>	80.4	76.4	83.7	82.4	<b>80.8</b>	<b>79.2</b>
21.	MP 3424	N-5A-21	71.3	79.4	<b>75.4</b>	80.5	79.7	78.6	<b>79.6</b>	77.9	76.7	82.6	79.7	<b>79.7</b>	<b>78.1</b>
22.	NIAW 2325	N-5A-22	70.3	78.5	<b>74.4</b>	82.1	78.4	77.4	<b>79.3</b>	80.7	82.2	83.2	83.0	<b>82.8</b>	<b>79.3</b>
23.	BRW 3753	N-5A-23	70.2	77.9	<b>74.1</b>	78.8	70.7	72.6	<b>74.0</b>	77.3	74.1	78.2	79.0	<b>77.1</b>	<b>75.6</b>
24.	MP 1291	N-5A-24	75.5	68.6	<b>72.1</b>	80.8	80.4	78.9	<b>80.0</b>	78.8	77.3	82.1	79.6	<b>79.7</b>	<b>77.6</b>
25.	HD 3173	N-5A-25	76.0	73.4	<b>74.7</b>	78.0	80.4	78.9	<b>79.1</b>	79.0	74.5	79.7	79.9	<b>78.0</b>	<b>77.7</b>
26.	NI 5439 (c)	N-5A-26	67.4	72.9	<b>70.2</b>	76.1	77.4	73.4	<b>75.6</b>	77.6	73.8	78.8	80.2	<b>77.6</b>	<b>75.2</b>
27.	JWS 712	N-5A-27	71.2	79.1	<b>75.2</b>	79.7	79.7	79.6	<b>79.7</b>	80.5	79.1	83.0	81.6	<b>81.2</b>	<b>79.1</b>
28.	DBW 153	N-5A-28	76.5	73.2	<b>74.9</b>	80.5	78.2	80.7	<b>79.8</b>	81.3	73.4	81.0	81.3	<b>78.6</b>	<b>78.6</b>
29.	K 1317	N-5A-29	68.2	77.4	<b>72.8</b>	80.3	78.7	77.6	<b>78.9</b>	78.4	78.2	82.1	80.8	<b>80.4</b>	<b>77.6</b>
30.	MACS 6607	N-5A-30	75.2	75.8	<b>75.5</b>	81.8	80.6	79.3	<b>80.6</b>	81.0	79.2	82.5	82.3	<b>81.3</b>	<b>79.6</b>
31.	NW 6035	N-5A-31	73.2	78.1	<b>75.7</b>	78.5	75.9	76.7	<b>77.0</b>	77.9	77.6	80.2	80.4	<b>79.4</b>	<b>77.5</b>
32.	HD 2888 (c)	N-5A-32	67.5	79.3	<b>73.4</b>	78.3	74.8	73.0	<b>75.4</b>	76.4	75.7	80.8	78.2	<b>78.2</b>	<b>75.8</b>
33.	DBW 152	N-5A-33	75.2	76.9	<b>76.1</b>	81.4	81.1	79.3	<b>80.6</b>	80.6	75.6	83.5	80.8	<b>79.9</b>	<b>79.3</b>
34.	HD 3172	N-5A-34	70.9	77.9	<b>74.4</b>	82.1	81.6	80.4	<b>81.4</b>	81.2	76.6	83.1	81.8	<b>80.5</b>	<b>79.4</b>
35.	MP 1292	N-5A-35	73.6	75.1	<b>74.4</b>	79.7	80.8	76.0	<b>78.8</b>	78.6	76.8	80.5	80.6	<b>79.3</b>	<b>77.8</b>
36.	JAUW 621	N-5A-36	76.1	79.5	<b>77.8</b>	80.2	77.7	77.2	<b>78.4</b>	76.3	76.4	76.6	78.5	<b>77.2</b>	<b>77.4</b>
	<b>Mean</b>		<b>71.0</b>	<b>76.4</b>	<b>73.7</b>	<b>79.9</b>	<b>78.7</b>	<b>77.3</b>	<b>78.7</b>	<b>79.4</b>	<b>79.3</b>	<b>81.6</b>	<b>80.5</b>	<b>79.7</b>	<b>77.8</b>

Table 27: Protein content (%) of *T. aestivum* genotypes in NIVT-5A

(Rainfed Timely Sown)

Sr. No	Entry	Trial Code	NWPZ			NEPZ				CZ	PZ				Overall Mean
			Ludhiana	Delhi	Mean	Kanpur	Sabour	Pusa	Mean	Kota	Pune	Niphad	Dharwad	Mean	
1.	HD 3171	N-5A-01	12.7	14.0	<b>13.4</b>	8.7	8.3	13.8	<b>10.3</b>	12.4	12.4	11.5	11.9	<b>11.9</b>	<b>12.0</b>
2.	UP 2887	N-5A-02	12.8	13.9	<b>13.3</b>	9.0	8.6	13.2	<b>10.3</b>	13.6	15.8	11.8	13.8	<b>13.8</b>	<b>12.7</b>
3.	HD 3174	N-5A-03	12.4	13.8	<b>13.1</b>	9.4	8.9	13.1	<b>10.5</b>	13.2	13.3	13.2	13.2	<b>13.2</b>	<b>12.5</b>
4.	MP 1290	N-5A-04	11.8	14.4	<b>13.1</b>	11.0	9.2	12.6	<b>11.0</b>	12.7	13.2	11.9	12.6	<b>12.6</b>	<b>12.3</b>
5.	MP 3288 (c)	N-5A-05	12.4	13.9	<b>13.1</b>	9.1	8.9	12.8	<b>10.3</b>	13.5	14.4	12.9	13.7	<b>13.7</b>	<b>12.6</b>
6.	MP 1293	N-5A-06	12.0	14.5	<b>13.2</b>	9.0	8.4	12.4	<b>9.9</b>	13.6	15.1	12.4	13.7	<b>13.7</b>	<b>12.6</b>
7.	HUW 689	N-5A-07	13.2	14.1	<b>13.7</b>	8.7	8.7	12.1	<b>9.9</b>	12.5	14.0	9.8	11.9	<b>11.9</b>	<b>12.0</b>
8.	WH 1166	N-5A-08	13.1	12.4	<b>12.8</b>	9.3	9.1	12.9	<b>10.4</b>	14.5	16.3	14.3	15.3	<b>15.3</b>	<b>13.2</b>
9.	UP 2886	N-5A-09	11.0	13.5	<b>12.3</b>	10.3	9.0	13.8	<b>11.0</b>	12.2	12.8	11.5	12.1	<b>12.1</b>	<b>11.9</b>
10.	MACS 6648	N-5A-10	11.6	13.1	<b>12.3</b>	8.1	8.0	10.5	<b>8.9</b>	12.6	13.6	11.8	12.7	<b>12.7</b>	<b>11.6</b>
11.	WH 1080 (c)	N-5A-11	12.8	13.5	<b>13.2</b>	9.5	9.7	11.7	<b>10.3</b>	13.2	14.3	12.2	13.2	<b>13.2</b>	<b>12.5</b>
12.	K 1316	N-5A-12	11.2	13.6	<b>12.4</b>	9.2	9.2	12.5	<b>10.3</b>	13.0	14.4	12.2	13.3	<b>13.3</b>	<b>12.3</b>
13.	CG 1012	N-5A-13	12.1	13.2	<b>12.7</b>	8.8	9.3	12.7	<b>10.2</b>	12.9	14.1	11.8	13.0	<b>13.0</b>	<b>12.2</b>
14.	UAS 365	N-5A-14	11.4	12.9	<b>12.1</b>	8.6	8.0	11.3	<b>9.3</b>	12.0	12.7	11.4	12.0	<b>12.0</b>	<b>11.4</b>
15.	K 1315	N-5A-15	12.4	13.6	<b>13.0</b>	9.7	8.5	12.5	<b>10.2</b>	12.5	12.9	11.5	12.2	<b>12.2</b>	<b>12.0</b>
16.	HI 1605	N-5A-16	12.2	13.6	<b>12.9</b>	9.9	8.1	13.4	<b>10.5</b>	13.2	13.9	12.6	13.3	<b>13.3</b>	<b>12.5</b>
17.	RAJ 4386	N-5A-17	13.3	14.6	<b>14.0</b>	10.5	9.3	12.8	<b>10.9</b>	13.2	12.3	13.4	12.9	<b>12.9</b>	<b>12.7</b>
18.	PBW 720	N-5A-18	12.3	12.8	<b>12.6</b>	10.6	9.5	13.3	<b>11.1</b>	12.9	13.3	12.8	13.0	<b>13.0</b>	<b>12.4</b>
19.	PBW 721	N-5A-19	11.4	13.6	<b>12.5</b>	9.5	9.6	13.3	<b>10.8</b>	13.0	13.7	12.9	13.3	<b>13.3</b>	<b>12.4</b>
20.	WH 1167	N-5A-20	12.0	13.6	<b>12.8</b>	9.9	9.3	12.9	<b>10.7</b>	13.2	14.7	12.3	13.5	<b>13.5</b>	<b>12.6</b>
21.	MP 3424	N-5A-21	11.9	12.9	<b>12.4</b>	10.6	9.9	11.6	<b>10.7</b>	13.1	14.0	12.8	13.4	<b>13.4</b>	<b>12.4</b>
22.	NIAW 2325	N-5A-22	11.7	14.3	<b>13.0</b>	9.7	8.3	12.2	<b>10.1</b>	12.1	11.9	11.4	11.7	<b>11.7</b>	<b>11.7</b>
23.	BRW 3753	N-5A-23	11.3	13.7	<b>12.5</b>	8.6	8.3	12.2	<b>9.7</b>	11.8	12.2	10.6	11.4	<b>11.4</b>	<b>11.4</b>
24.	MP 1291	N-5A-24	12.1	12.7	<b>12.4</b>	9.3	10.2	12.7	<b>10.7</b>	13.0	14.1	12.4	13.3	<b>13.3</b>	<b>12.3</b>
25.	HD 3173	N-5A-25	11.4	14.4	<b>12.9</b>	10.5	8.6	11.8	<b>10.3</b>	13.2	14.0	12.5	13.3	<b>13.3</b>	<b>12.4</b>
26.	NI 5439 (c)	N-5A-26	10.5	14.2	<b>12.4</b>	9.3	8.0	12.4	<b>9.9</b>	12.3	13.6	11.0	12.3	<b>12.3</b>	<b>11.7</b>
27.	JWS 712	N-5A-27	12.7	14.5	<b>13.6</b>	10.1	9.9	12.6	<b>10.8</b>	12.6	13.0	11.3	12.1	<b>12.1</b>	<b>12.3</b>
28.	DBW 153	N-5A-28	12.5	12.8	<b>12.6</b>	9.1	9.0	12.4	<b>10.2</b>	13.1	14.7	12.1	13.4	<b>13.4</b>	<b>12.3</b>
29.	K 1317	N-5A-29	13.6	13.4	<b>13.5</b>	9.6	10.9	13.5	<b>11.4</b>	13.2	14.4	11.8	13.1	<b>13.1</b>	<b>12.8</b>
30.	MACS 6607	N-5A-30	11.6	13.4	<b>12.5</b>	9.8	9.4	13.9	<b>11.0</b>	12.4	13.3	11.5	12.4	<b>12.4</b>	<b>12.1</b>
31.	NW 6035	N-5A-31	12.8	13.1	<b>13.0</b>	10.3	10.5	11.8	<b>10.8</b>	13.4	14.2	13.0	13.6	<b>13.6</b>	<b>12.7</b>
32.	HD 2888 (c)	N-5A-32	12.4	14.7	<b>13.6</b>	10.9	9.7	12.8	<b>11.2</b>	13.2	14.2	12.0	13.1	<b>13.1</b>	<b>12.8</b>
33.	DBW 152	N-5A-33	11.6	13.9	<b>12.8</b>	8.8	8.5	11.1	<b>9.5</b>	13.0	14.5	11.6	13.0	<b>13.0</b>	<b>12.1</b>
34.	HD 3172	N-5A-34	12.0	13.2	<b>12.6</b>	10.3	8.6	13.3	<b>10.7</b>	13.5	15.0	12.9	14.0	<b>14.0</b>	<b>12.7</b>
35.	MP 1292	N-5A-35	11.8	15.0	<b>13.4</b>	8.9	8.1	12.0	<b>9.6</b>	12.8	13.2	11.9	12.5	<b>12.5</b>	<b>12.1</b>
36.	JAUW 621	N-5A-36	12.5	13.8	<b>13.1</b>	10.0	10.4	13.9	<b>11.4</b>	14.4	15.2	14.7	15.0	<b>15.0</b>	<b>13.5</b>
	<b>Mean</b>		<b>12.1</b>	<b>13.7</b>	<b>12.9</b>	<b>9.6</b>	<b>9.0</b>	<b>12.6</b>	<b>10.4</b>	<b>13.0</b>	<b>13.9</b>	<b>12.2</b>	<b>12.2</b>	<b>12.9</b>	<b>12.3</b>

Table 28: Sedimentation value (ml) of *T.aestivum* genotypes in NIVT-5A

(Rainfed Timely Sown)

Sr. No	Entry	Trial Code	NWPZ			NEPZ				CZ	PZ				Overall Mean
			Ludhiana	Delhi	Mean	Kanpur	Pusa	Sabour	Mean		Kota	Pune	Niphad	Dharwad	
1.	HD 3171	N-5A-01	53	52	<b>53</b>	50	52	51	<b>51</b>	54	54	51	50	<b>52</b>	<b>53</b>
2.	UP 2887	N-5A-02	50	40	<b>45</b>	48	46	47	<b>47</b>	53	50	50	59	<b>53</b>	<b>48</b>
3.	HD 3174	N-5A-03	51	45	<b>48</b>	45	47	46	<b>46</b>	50	58	49	52	<b>53</b>	<b>49</b>
4.	MP 1290	N-5A-04	43	48	<b>46</b>	41	43	38	<b>41</b>	43	47	48	49	<b>48</b>	<b>45</b>
5.	MP 3288 (c)	N-5A-05	53	50	<b>52</b>	45	53	44	<b>47</b>	55	49	55	57	<b>54</b>	<b>52</b>
6.	MP 1293	N-5A-06	44	43	<b>44</b>	36	50	42	<b>43</b>	37	55	48	57	<b>53</b>	<b>41</b>
7.	HUW 689	N-5A-07	46	41	<b>44</b>	40	49	44	<b>44</b>	38	51	57	54	<b>54</b>	<b>42</b>
8.	WH 1166	N-5A-08	47	32	<b>40</b>	43	48	46	<b>46</b>	40	59	57	49	<b>55</b>	<b>40</b>
9.	UP 2886	N-5A-09	33	38	<b>36</b>	34	44	45	<b>41</b>	46	42	48	48	<b>46</b>	<b>39</b>
10.	MACS 6648	N-5A-10	50	50	<b>50</b>	44	51	45	<b>47</b>	50	53	50	55	<b>53</b>	<b>50</b>
11.	WH 1080 (c)	N-5A-11	56	59	<b>58</b>	54	57	55	<b>50</b>	52	50	56	63	<b>56</b>	<b>55</b>
12.	K 1316	N-5A-12	50	45	<b>48</b>	52	50	51	<b>51</b>	55	55	55	60	<b>57</b>	<b>50</b>
13.	CG 1012	N-5A-13	43	50	<b>47</b>	40	43	41	<b>41</b>	50	45	48	54	<b>49</b>	<b>48</b>
14.	UAS 365	N-5A-14	35	33	<b>34</b>	27	40	38	<b>35</b>	32	36	43	41	<b>40</b>	<b>33</b>
15.	K 1315	N-5A-15	45	48	<b>47</b>	36	34	35	<b>35</b>	32	40	34	38	<b>37</b>	<b>42</b>
16.	HI 1605	N-5A-16	52	51	<b>52</b>	45	49	45	<b>46</b>	50	41	49	57	<b>49</b>	<b>51</b>
17.	RAJ 4386	N-5A-17	42	44	<b>43</b>	42	51	39	<b>44</b>	41	50	50	55	<b>52</b>	<b>42</b>
18.	PBW 720	N-5A-18	38	49	<b>44</b>	35	45	40	<b>40</b>	38	53	48	56	<b>52</b>	<b>42</b>
19.	PBW 721	N-5A-19	42	39	<b>41</b>	43	52	48	<b>48</b>	52	58	53	50	<b>54</b>	<b>44</b>
20.	WH 1167	N-5A-20	48	40	<b>44</b>	45	53	46	<b>48</b>	43	57	49	57	<b>54</b>	<b>44</b>
21.	MP 3424	N-5A-21	51	38	<b>45</b>	53	54	55	<b>54</b>	55	55	56	50	<b>54</b>	<b>48</b>
22.	NIAW 2325	N-5A-22	37	46	<b>42</b>	34	45	36	<b>38</b>	45	45	49	50	<b>48</b>	<b>43</b>
23.	BRW 3753	N-5A-23	42	45	<b>44</b>	38	49	38	<b>42</b>	42	53	54	50	<b>52</b>	<b>43</b>
24.	MP 1291	N-5A-24	52	45	<b>49</b>	43	53	53	<b>50</b>	48	62	50	60	<b>57</b>	<b>48</b>
25.	HD 3173	N-5A-25	54	51	<b>53</b>	50	48	43	<b>47</b>	49	55	51	53	<b>53</b>	<b>51</b>
26.	NI 5439 (c)	N-5A-26	41	39	<b>40</b>	40	39	41	<b>43</b>	55	43	40	53	<b>45</b>	<b>41</b>
27.	JWS 712	N-5A-27	41	48	<b>45</b>	39	50	40	<b>43</b>	42	45	49	50	<b>48</b>	<b>44</b>
28.	DBW 153	N-5A-28	40	46	<b>43</b>	39	40	49	<b>43</b>	33	56	44	51	<b>50</b>	<b>40</b>
29.	K 1317	N-5A-29	45	47	<b>46</b>	43	48	48	<b>46</b>	52	51	53	52	<b>52</b>	<b>48</b>
30.	MACS 6607	N-5A-30	48	44	<b>46</b>	43	50	43	<b>45</b>	47	50	49	53	<b>51</b>	<b>46</b>
31.	NW 6035	N-5A-31	58	43	<b>51</b>	44	44	53	<b>47</b>	53	52	52	52	<b>52</b>	<b>51</b>
32.	HD 2888 (c)	N-5A-32	50	51	<b>51</b>	45	43	46	<b>45</b>	45	35	44	44	<b>41</b>	<b>49</b>
33.	DBW 152	N-5A-33	50	34	<b>42</b>	38	49	40	<b>42</b>	53	55	58	62	<b>58</b>	<b>46</b>
34.	HD 3172	N-5A-34	40	38	<b>39</b>	44	49	52	<b>48</b>	50	53	52	50	<b>52</b>	<b>43</b>
35.	MP 1292	N-5A-35	49	42	<b>46</b>	45	49	46	<b>47</b>	53	59	50	59	<b>56</b>	<b>48</b>
36.	JAUW 621	N-5A-36	40	39	<b>40</b>	45	50	42	<b>46</b>	45	45	46	51	<b>47</b>	<b>41</b>
	<b>Mean</b>		<b>46</b>	<b>44</b>	<b>45</b>	<b>42</b>	<b>48</b>	<b>44</b>	<b>45</b>	<b>45</b>	<b>50</b>	<b>50</b>	<b>53</b>	<b>51</b>	<b>46</b>

**Table 29: Grain appearance score (Max. score 10) of *T.aestivum* genotypes in NIVT-5A (Restricted Irrigation Timely Sown)**

Sr. No.	Entry	Trail Code	Indore	Kota	Mean
1	HD 3171	N-5A-01	5.9	5.8	<b>5.8</b>
2	UP 2887	N-5A-02	6.3	5.9	<b>6.1</b>
3	HD 3174	N-5A-03	5.8	5.5	<b>5.7</b>
4	MP 1290	N-5A-04	6.3	5.9	<b>6.1</b>
5	MP 3288 (c)	N-5A-05	6.0	5.5	<b>5.7</b>
6	MP 1293	N-5A-06	6.3	5.8	<b>6.0</b>
7	HUW 689	N-5A-07	5.6	5.4	<b>5.5</b>
8	WH 1166	N-5A-08	6.4	5.5	<b>6.0</b>
9	UP 2886	N-5A-09	6.2	5.8	<b>6.0</b>
10	MACS 6648	N-5A-10	5.8	5.5	<b>5.6</b>
11	WH 1080 (c)	N-5A-11	6.0	5.7	<b>5.9</b>
12	K 1316	N-5A-12	6.2	5.9	<b>6.0</b>
13	CG 1012	N-5A-13	6.3	5.9	<b>6.1</b>
14	UAS 365	N-5A-14	5.9	5.7	<b>5.8</b>
15	K 1315	N-5A-15	6.2	6.0	<b>6.1</b>
16	HI 1605	N-5A-16	6.1	5.8	<b>6.0</b>
17	RAJ 4386	N-5A-17	6.1	5.5	<b>5.8</b>
18	PBW 720	N-5A-18	6.0	5.8	<b>5.9</b>
19	PBW 721	N-5A-19	5.7	5.7	<b>5.7</b>
20	WH 1167	N-5A-20	6.4	5.8	<b>6.1</b>
21	MP 3424	N-5A-21	6.0	5.5	<b>5.7</b>
22	NIAW 2325	N-5A-22	5.9	5.6	<b>5.7</b>
23	BRW 3753	N-5A-23	5.9	5.7	<b>5.8</b>
24	MP 1291	N-5A-24	6.2	5.5	<b>5.9</b>
25	HD 3173	N-5A-25	6.1	5.9	<b>6.0</b>
26	NI 5439 (c)	N-5A-26	6.0	5.8	<b>5.9</b>
27	JWS 712	N-5A-27	6.2	5.7	<b>5.9</b>
28	DBW 153	N-5A-28	6.2	6.0	<b>6.1</b>
29	K 1317	N-5A-29	5.9	5.8	<b>5.9</b>
30	MACS 6607	N-5A-30	6.1	5.6	<b>5.8</b>
31	NW 6035	N-5A-31	5.8	5.5	<b>5.7</b>
32	HD 2888 (c)	N-5A-32	6.2	5.4	<b>5.8</b>
33	DBW 152	N-5A-33	6.4	5.9	<b>6.1</b>
34	HD 3172	N-5A-34	6.4	6.0	<b>6.2</b>
35	MP 1292	N-5A-35	5.8	5.7	<b>5.8</b>
36	JAUW 621	N-5A-36	6.0	5.7	<b>5.8</b>
<b>Mean</b>			<b>6.0</b>	<b>5.7</b>	<b>5.9</b>

**Table 30: Test weight (kg/hl) of *T.aestivum* genotypes in NIVT-5A  
(Restricted Irrigation Timely Sown)**

Sr. No.	Entry	Trail Code	Indore	Kota	Mean
1	HD 3171	N-5A-01	81.8	80.8	<b>81.3</b>
2	UP 2887	N-5A-02	83.1	81.0	<b>82.0</b>
3	HD 3174	N-5A-03	80.5	79.2	<b>79.8</b>
4	MP 1290	N-5A-04	81.6	80.5	<b>81.0</b>
5	MP 3288 (c)	N-5A-05	80.6	78.5	<b>79.5</b>
6	MP 1293	N-5A-06	80.0	77.0	<b>78.5</b>
7	HUW 689	N-5A-07	80.5	79.1	<b>79.8</b>
8	WH 1166	N-5A-08	82.3	79.5	<b>80.9</b>
9	UP 2886	N-5A-09	82.1	80.8	<b>81.4</b>
10	MACS 6648	N-5A-10	79.8	76.9	<b>78.3</b>
11	WH 1080 (c)	N-5A-11	81.0	80.0	<b>80.5</b>
12	K 1316	N-5A-12	81.6	79.1	<b>80.3</b>
13	CG 1012	N-5A-13	82.7	81.6	<b>82.1</b>
14	UAS 365	N-5A-14	83.3	81.9	<b>82.6</b>
15	K 1315	N-5A-15	80.1	79.8	<b>79.9</b>
16	HI 1605	N-5A-16	81.3	80.2	<b>80.7</b>
17	RAJ 4386	N-5A-17	81.1	78.0	<b>79.5</b>
18	PBW 720	N-5A-18	82.1	80.9	<b>81.5</b>
19	PBW 721	N-5A-19	79.7	80.3	<b>80.0</b>
20	WH 1167	N-5A-20	81.8	81.4	<b>81.6</b>
21	MP 3424	N-5A-21	79.8	79.2	<b>79.5</b>
22	NIAW 2325	N-5A-22	81.6	80.7	<b>81.1</b>
23	BRW 3753	N-5A-23	78.3	78.0	<b>78.1</b>
24	MP 1291	N-5A-24	81.8	80.4	<b>81.1</b>
25	HD 3173	N-5A-25	81.3	79.5	<b>80.4</b>
26	NI 5439 (c)	N-5A-26	80.2	77.3	<b>78.7</b>
27	JWS 712	N-5A-27	81.3	80.0	<b>80.7</b>
28	DBW 153	N-5A-28	85.8	80.6	<b>83.2</b>
29	K 1317	N-5A-29	80.6	79.3	<b>79.9</b>
30	MACS 6607	N-5A-30	82.4	81.3	<b>81.8</b>
31	NW 6035	N-5A-31	80.7	77.8	<b>79.2</b>
32	HD 2888 (c)	N-5A-32	80.0	73.4	<b>76.7</b>
33	DBW 152	N-5A-33	81.9	80.8	<b>81.3</b>
34	HD 3172	N-5A-34	83.1	80.7	<b>81.9</b>
35	MP 1292	N-5A-35	81.5	81.0	<b>81.2</b>
36	JAUW 621	N-5A-36	80.3	78.4	<b>79.3</b>
<b>Mean</b>			<b>81.3</b>	<b>79.5</b>	<b>80.4</b>



**Table 31: Protein content (%) of *T.aestivum* genotypes in NIVT-5A  
(Restricted Irrigation Timely Sown)**

Sr. No.	Entry	Trail Code	Indore	Kota	Mean
1	HD 3171	N-5A-01	10.5	12.8	11.7
2	UP 2887	N-5A-02	10.8	13.1	11.9
3	HD 3174	N-5A-03	11.9	13.2	12.5
4	MP 1290	N-5A-04	11.1	12.8	11.9
5	MP 3288 (c)	N-5A-05	11.7	13.6	12.7
6	MP 1293	N-5A-06	11.4	11.9	11.7
7	HUW 689	N-5A-07	10.4	12.4	11.4
8	WH 1166	N-5A-08	11.0	10.5	10.8
9	UP 2886	N-5A-09	11.1	12.8	12.0
10	MACS 6648	N-5A-10	9.7	11.5	10.6
11	WH 1080 (c)	N-5A-11	10.3	12.3	11.3
12	K 1316	N-5A-12	10.1	11.3	10.7
13	CG 1012	N-5A-13	10.9	12.9	11.9
14	UAS 365	N-5A-14	10.7	10.7	10.7
15	K 1315	N-5A-15	10.8	11.9	11.4
16	HI 1605	N-5A-16	11.1	13.4	12.2
17	RAJ 4386	N-5A-17	11.3	13.2	12.2
18	PBW 720	N-5A-18	12.2	13.2	12.7
19	PBW 721	N-5A-19	12.3	12.9	12.6
20	WH 1167	N-5A-20	12.9	12.4	12.7
21	MP 3424	N-5A-21	12.1	12.0	12.1
22	NIAW 2325	N-5A-22	12.5	13.2	12.8
23	BRW 3753	N-5A-23	10.1	12.6	11.3
24	MP 1291	N-5A-24	12.5	12.6	12.5
25	HD 3173	N-5A-25	11.2	12.2	11.7
26	NI 5439 (c)	N-5A-26	10.6	11.1	10.9
27	JWS 712	N-5A-27	10.5	13.1	11.8
28	DBW 153	N-5A-28	10.9	13.2	12.0
29	K 1317	N-5A-29	12.3	13.5	12.9
30	MACS 6607	N-5A-30	11.3	12.2	11.7
31	NW 6035	N-5A-31	11.6	13.0	12.3
32	HD 2888 (c)	N-5A-32	10.4	13.9	12.2
33	DBW 152	N-5A-33	10.8	11.8	11.3
34	HD 3172	N-5A-34	11.4	14.6	13.0
35	MP 1292	N-5A-35	10.8	12.2	11.5
36	JAUW 621	N-5A-36	13.7	13.4	13.6
<b>Mean</b>			<b>11.2</b>	<b>12.8</b>	<b>11.9</b>

**Table 32: Sedimentation value (ml) of *T. aestivum* genotypes in NIVT-5A  
(Restricted Irrigation Timely Sown)**

Sr. No.	Entry	Trail Code	Indore	Kota	Mean
1	HD 3171	N-5A-01	52	55	<b>54</b>
2	UP 2887	N-5A-02	60	56	<b>58</b>
3	HD 3174	N-5A-03	52	54	<b>53</b>
4	MP 1290	N-5A-04	39	43	<b>41</b>
5	MP 3288 (c)	N-5A-05	53	50	<b>51</b>
6	MP 1293	N-5A-06	45	44	<b>45</b>
7	HUW 689	N-5A-07	47	52	<b>50</b>
8	WH 1166	N-5A-08	46	43	<b>45</b>
9	UP 2886	N-5A-09	41	38	<b>40</b>
10	MACS 6648	N-5A-10	51	55	<b>53</b>
11	WH 1080 (c)	N-5A-11	51	59	<b>55</b>
12	K 1316	N-5A-12	57	62	<b>60</b>
13	CG 1012	N-5A-13	44	45	<b>45</b>
14	UAS 365	N-5A-14	32	35	<b>34</b>
15	K 1315	N-5A-15	31	33	<b>32</b>
16	HI 1605	N-5A-16	49	49	<b>49</b>
17	RAJ 4386	N-5A-17	40	43	<b>42</b>
18	PBW 720	N-5A-18	44	45	<b>45</b>
19	PBW 721	N-5A-19	46	49	<b>48</b>
20	WH 1167	N-5A-20	44	42	<b>43</b>
21	MP 3424	N-5A-21	60	60	<b>60</b>
22	NIAW 2325	N-5A-22	43	38	<b>41</b>
23	BRW 3753	N-5A-23	40	47	<b>44</b>
24	MP 1291	N-5A-24	48	49	<b>49</b>
25	HD 3173	N-5A-25	52	49	<b>51</b>
26	NI 5439 (c)	N-5A-26	53	52	<b>53</b>
27	JWS 712	N-5A-27	40	45	<b>43</b>
28	DBW 153	N-5A-28	32	42	<b>37</b>
29	K 1317	N-5A-29	53	50	<b>52</b>
30	MACS 6607	N-5A-30	55	52	<b>54</b>
31	NW 6035	N-5A-31	45	50	<b>48</b>
32	HD 2888 (c)	N-5A-32	37	42	<b>40</b>
33	DBW 152	N-5A-33	50	51	<b>51</b>
34	HD 3172	N-5A-34	53	57	<b>55</b>
35	MP 1292	N-5A-35	49	48	<b>49</b>
36	JAUW 621	N-5A-36	40	38	<b>39</b>
<b>Mean</b>			<b>46</b>	<b>48</b>	<b>47</b>

## **NIVT 5B (Rainfed and Restricted Irrigation Timely Sown – *T. durum*)**

Grain samples of this durum trial belonged to rainfed as well as moisture stress conditions of central-peninsular India i.e. CZ and PZ. 25 entries were analyzed for grain appearance, test weight, grain protein and yellow pigment contents, sedimentation value and yellow berry incidence. Grain appearance score was generally good. Even though GAS varied from 5.4 to 7.6; 16 entries registered  $\geq 6.5$  and the best entry was MPO 1294 (7.6). Test weight of durum genotypes was generally high as it fell below 80kg/hl only in four genotypes; otherwise it ranged between 82 to 86 kg/hl. Differences between sites and genotypes were large for protein content. In CZ, range in GPC was 11.4 to 13.9% in CZ and 12.2 to 15.2% in PZ. Across the zones, top rankers were GW 1313 and MACS 3972 with GPC  $\approx 14\%$ . Genotypic differences in sedimentation value were quite frequent and the range was 18 to 37ml in NWPZ and 19 to 39ml in PZ. Superior genotypes across the zones were HI 8765 and MPO 1295 with sedimentation value 37-38ml. Yellow berry incidence was high (35-52%) at Indore and Kota; moderate at Dhanduka, Annigeri and Dharwad (15-22%); and lowest at Powarkheda (5.6%). Entries with yellow berry incidence below 10% were DDW 34, KD 1318, UAS 454 and GW 1317. Durum entries with incidence  $\geq 30\%$  were HI 8762, AKDW 2997-16 (C), HI 8763 and DDW 33. Yellow pigment content in durum entries varied from 3.1 to 7.9ppm. DDW 33 had 7.7 and 7.9ppm yellow pigments in CZ and PZ, respectively. Other good entries with yellow pigments  $\geq 6$ ppm were MPO 1294, DDW 34, UAS 454, HI 8627 (C) and HI 8766.

**Table 33: Grain appearance score (Max-10) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	7.5	6.5	6.5	7.0	7.5	<b>7.0</b>	7.0	6.5	7.0	<b>6.8</b>	<b>6.9</b>
2	GW 1313	N-5B-02	6.5	6.0	3.5	4.5	6.5	<b>5.4</b>	7.5	6.5	8.0	<b>7.3</b>	<b>6.1</b>
3	RKD 268	N-5B-03	7.5	6.5	5.5	7.0	7.5	<b>6.8</b>	6.5	5.0	8.5	<b>6.7</b>	<b>6.8</b>
4	HI 8764	N-5B-04	7.5	6.0	7.0	6.5	6.5	<b>6.7</b>	6.5	7.0	7.5	<b>7.0</b>	<b>6.8</b>
5	RKD 270	N-5B-05	7.5	7.0	4.5	6.0	7.5	<b>6.5</b>	6.5	7.0	7.5	<b>7.0</b>	<b>6.7</b>
6	MACS 3972	N-5B-06	7.5	5.5	5.5	6.5	7.5	<b>6.5</b>	7.5	6.5	8.0	<b>7.3</b>	<b>6.8</b>
7	HI 8762	N-5B-07	6.5	5.5	4.5	6.5	7.5	<b>6.1</b>	6.5	6.0	8.0	<b>6.8</b>	<b>6.4</b>
8	MACS 3970	N-5B-08	7.5	3.5	5.5	5.5	7.5	<b>5.9</b>	7.5	6.5	7.0	<b>7.0</b>	<b>6.3</b>
9	HI 8765	N-5B-09	7.5	4.5	7.0	6.0	8.0	<b>6.6</b>	7.5	6.5	7.5	<b>7.2</b>	<b>6.8</b>
10	MPO 1294	N-5B-10	8.0	7.0	6.5	6.0	8.0	<b>7.1</b>	8.5	8.0	8.5	<b>8.3</b>	<b>7.6</b>
11	DDW 34	N-5B-11	6.0	8.0	5.5	6.0	7.5	<b>6.6</b>	7.0	6.5	8.5	<b>7.3</b>	<b>6.9</b>
12	GW 1316	N-5B-12	7.0	6.5	5.5	4.5	7.5	<b>6.2</b>	7.0	7.0	7.5	<b>7.2</b>	<b>6.6</b>
13	NIDW 765	N-5B-13	7.5	7.5	6.0	6.5	8.0	<b>7.1</b>	7.0	7.0	8.0	<b>7.3</b>	<b>7.2</b>
14	GW 1315	N-5B-14	7.0	6.5	4.5	4.5	6.5	<b>5.8</b>	8.0	5.5	6.5	<b>6.7</b>	<b>6.1</b>
15	MACS 4020	N-5B-15	7.5	7.5	4.5	5.0	7.5	<b>6.4</b>	6.5	7.0	6.5	<b>6.7</b>	<b>6.5</b>
16	MPO 1295	N-5B-16	7.5	6.5	5.0	5.5	6.5	<b>6.2</b>	7.5	5.5	7.0	<b>6.7</b>	<b>6.4</b>
17	KD 1318	N-5B-17	7.5	7.5	5.0	6.5	5.5	<b>6.4</b>	8.0	6.5	6.5	<b>7.0</b>	<b>6.6</b>
18	AKDW 2997-16 (C)	N-5B-18	5.5	5.5	5.0	6.0	6.5	<b>5.7</b>	7.0	6.5	7.5	<b>7.0</b>	<b>6.2</b>
19	UAS 454	N-5B-19	7.0	6.5	8.5	4.5	8.5	<b>7.0</b>	6.5	7.5	7.5	<b>7.2</b>	<b>7.1</b>
20	HI 8627 (c)	N-5B-20	7.5	5.5	5.0	6.5	7.5	<b>6.4</b>	8.0	8.5	6.5	<b>7.7</b>	<b>6.9</b>
21	GW 1314	N-5B-21	7.5	5.5	4.0	5.5	7.5	<b>6.0</b>	7.0	7.5	6.5	<b>7.0</b>	<b>6.4</b>
22	HI 8766	N-5B-22	7.0	6.5	7.0	5.5	7.5	<b>6.7</b>	7.0	6.5	6.0	<b>6.5</b>	<b>6.6</b>
23	HI 8763	N-5B-23	7.5	7.0	5.5	7.0	7.5	<b>6.9</b>	7.5	7.5	8.0	<b>7.7</b>	<b>7.2</b>
24	GW 1317	N-5B-24	6.0	5.5	6.5	5.0	7.5	<b>6.1</b>	7.0	6.5	7.5	<b>7.0</b>	<b>6.4</b>
25	DDW 33	N-5B-25	5.5	4.5	5.5	3.5	7.5	<b>5.3</b>	7.0	4.0	5.5	<b>5.5</b>	<b>5.4</b>
	<b>Mean</b>		<b>7.1</b>	<b>6.2</b>	<b>5.6</b>	<b>5.7</b>	<b>7.3</b>	<b>6.4</b>	<b>7.2</b>	<b>6.6</b>	<b>7.3</b>	<b>7.0</b>	<b>6.6</b>

**Table 34: Test Weight (Kg/hl) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	86.8	87.3	82.9	84.1	82.8	<b>84.8</b>	85.3	85.6	84.9	<b>85.3</b>	<b>85.0</b>
2	GW 1313	N-5B-02	76.2	77.9	58.8	59.5	72.1	<b>68.9</b>	77.2	77.6	82.5	<b>79.1</b>	<b>72.7</b>
3	RKD 268	N-5B-03	86.1	85.2	82.5	81.8	83.3	<b>83.8</b>	84.0	85.0	84.5	<b>84.5</b>	<b>84.1</b>
4	HI 8764	N-5B-04	84.7	83.1	83.9	82.3	81.5	<b>83.1</b>	82.6	84.2	82.8	<b>83.2</b>	<b>83.1</b>
5	RKD 270	N-5B-05	75.2	84.4	80.4	80.8	81.7	<b>80.5</b>	83.2	82.7	81.8	<b>82.6</b>	<b>81.3</b>
6	MACS 3972	N-5B-06	86.3	86.1	83.9	86.7	84.9	<b>85.6</b>	85.9	86.7	85.5	<b>86.1</b>	<b>85.8</b>
7	HI 8762	N-5B-07	83.3	83.6	81.6	83.2	83.5	<b>83.0</b>	84.2	84.3	83.8	<b>84.1</b>	<b>83.4</b>
8	MACS 3970	N-5B-08	85.1	85.0	84.0	83.8	83.9	<b>84.4</b>	85.0	85.6	84.3	<b>85.0</b>	<b>84.6</b>
9	HI 8765	N-5B-09	87.1	86.0	86.2	84.9	83.6	<b>85.6</b>	85.9	86.6	83.8	<b>85.4</b>	<b>85.5</b>
10	MPO 1294	N-5B-10	84.0	86.2	81.5	80.0	83.4	<b>83.0</b>	82.5	84.2	82.6	<b>83.1</b>	<b>83.1</b>
11	DDW 34	N-5B-11	84.4	84.2	81.6	82.0	80.5	<b>82.5</b>	82.8	81.1	82.0	<b>82.0</b>	<b>82.3</b>
12	GW 1316	N-5B-12	76.5	80.9	76.1	79.2	76.9	<b>77.9</b>	78.7	77.9	79.1	<b>78.6</b>	<b>78.2</b>
13	NIDW 765	N-5B-13	82.6	83.9	78.5	81.4	81.6	<b>81.6</b>	82.4	81.6	81.7	<b>81.9</b>	<b>81.7</b>
14	GW 1315	N-5B-14	79.1	77.9	75.8	68.0	69.8	<b>74.1</b>	79.2	79.5	77.4	<b>78.7</b>	<b>75.8</b>
15	MACS 4020	N-5B-15	84.1	82.9	80.7	79.1	81.0	<b>81.6</b>	83.9	82.1	83.4	<b>83.2</b>	<b>82.2</b>
16	MPO 1295	N-5B-16	87.3	86.2	84.9	83.7	85.8	<b>85.6</b>	86.2	86.6	86.1	<b>86.3</b>	<b>85.9</b>
17	KD 1318	N-5B-17	87.3	87.1	85.8	84.7	82.4	<b>85.5</b>	83.7	85.7	84.9	<b>84.8</b>	<b>85.2</b>
18	AKDW 2997-16 (C)	N-5B-18	83.4	81.2	83.2	83.0	83.4	<b>82.9</b>	85.2	85.9	84.8	<b>85.3</b>	<b>83.8</b>
19	UAS 454	N-5B-19	83.4	85.4	82.3	81.2	82.0	<b>82.9</b>	81.2	84.4	76.7	<b>80.8</b>	<b>82.1</b>
20	HI 8627 (c)	N-5B-20	85.8	86.3	82.7	85.1	84.3	<b>84.8</b>	83.7	85.1	84.1	<b>84.3</b>	<b>84.6</b>
21	GW 1314	N-5B-21	78.9	81.7	76.5	79.9	79.2	<b>79.2</b>	79.2	79.9	80.5	<b>79.9</b>	<b>79.5</b>
22	HI 8766	N-5B-22	86.2	86.1	84.4	85.3	84.5	<b>85.3</b>	86.3	84.9	85.2	<b>85.5</b>	<b>85.4</b>
23	HI 8763	N-5B-23	86.0	86.4	84.6	85.4	84.1	<b>85.3</b>	84.4	85.8	85.0	<b>85.1</b>	<b>85.2</b>
24	GW 1317	N-5B-24	85.3	86.7	85.5	84.6	84.1	<b>85.2</b>	82.8	82.5	84.3	<b>83.2</b>	<b>84.5</b>
25	DDW 33	N-5B-25	86.0	86.2	80.8	84.7	84.7	<b>84.5</b>	84.8	84.7	85.2	<b>84.9</b>	<b>84.6</b>
	<b>Mean</b>		<b>83.7</b>	<b>84.3</b>	<b>81.2</b>	<b>81.4</b>	<b>81.8</b>	<b>82.5</b>	<b>83.2</b>	<b>83.6</b>	<b>83.1</b>	<b>83.3</b>	<b>82.8</b>

**Table 35: Protein content (%) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	12.4	10.5	10.2	14.3	14.2	<b>12.3</b>	13.9	15.1	13.7	<b>14.2</b>	<b>13.0</b>
2	GW 1313	N-5B-02	13.3	11.1	14.6	15.7	14.7	<b>13.9</b>	14.7	14.2	15.0	<b>14.6</b>	<b>14.2</b>
3	RKD 268	N-5B-03	11.3	10.2	9.2	11.9	12.5	<b>11.0</b>	12.0	11.6	13.0	<b>12.2</b>	<b>11.5</b>
4	HI 8764	N-5B-04	12.4	11.5	10.8	14.2	13.5	<b>12.5</b>	11.6	13.0	13.8	<b>12.8</b>	<b>12.6</b>
5	RKD 270	N-5B-05	12.0	12.3	10.7	15.0	14.3	<b>12.9</b>	14.1	13.0	13.5	<b>13.5</b>	<b>13.1</b>
6	MACS 3972	N-5B-06	14.6	13.4	11.1	13.0	14.4	<b>13.3</b>	15.2	14.6	14.9	<b>14.9</b>	<b>13.9</b>
7	HI 8762	N-5B-07	10.1	11.2	10.9	13.3	14.0	<b>11.9</b>	12.7	12.2	12.7	<b>12.5</b>	<b>12.1</b>
8	MACS 3970	N-5B-08	12.2	11.4	11.2	14.5	14.1	<b>12.7</b>	13.8	13.7	13.2	<b>13.6</b>	<b>13.0</b>
9	HI 8765	N-5B-09	11.6	11.0	10.9	12.9	13.8	<b>12.0</b>	11.9	13.5	13.8	<b>13.1</b>	<b>12.4</b>
10	MPO 1294	N-5B-10	11.9	11.6	11.9	14.3	14.1	<b>12.8</b>	14.0	13.3	14.1	<b>13.8</b>	<b>13.2</b>
11	DDW 34	N-5B-11	13.4	11.7	10.5	14.3	15.3	<b>13.0</b>	14.6	12.4	14.9	<b>14.0</b>	<b>13.4</b>
12	GW 1316	N-5B-12	13.0	11.1	11.2	11.2	15.3	<b>12.4</b>	12.9	12.1	15.0	<b>13.3</b>	<b>12.7</b>
13	NIDW 765	N-5B-13	12.9	12.5	11.5	15.0	14.3	<b>13.2</b>	14.2	12.5	13.8	<b>13.5</b>	<b>13.3</b>
14	GW 1315	N-5B-14	13.1	12.2	11.1	14.9	14.6	<b>13.2</b>	11.0	12.3	14.0	<b>12.4</b>	<b>12.9</b>
15	MACS 4020	N-5B-15	11.8	11.3	11.0	13.4	14.5	<b>12.4</b>	12.7	14.2	13.7	<b>13.5</b>	<b>12.8</b>
16	MPO 1295	N-5B-16	13.0	11.9	10.7	12.2	14.9	<b>12.5</b>	15.4	13.7	14.9	<b>14.7</b>	<b>13.3</b>
17	KD 1318	N-5B-17	13.2	11.9	10.2	12.3	15.0	<b>12.5</b>	13.6	14.1	14.4	<b>14.0</b>	<b>13.1</b>
18	AKDW 2997-16 (C)	N-5B-18	11.1	10.4	10.2	11.8	12.5	<b>11.2</b>	13.6	13.0	12.5	<b>13.0</b>	<b>11.9</b>
19	UAS 454	N-5B-19	12.6	10.8	10.9	15.4	15.2	<b>13.0</b>	13.8	13.3	15.1	<b>14.1</b>	<b>13.4</b>
20	HI 8627 (c)	N-5B-20	12.8	10.2	10.4	11.0	13.6	<b>11.6</b>	14.1	13.6	14.0	<b>13.9</b>	<b>12.5</b>
21	GW 1314	N-5B-21	13.6	11.7	10.3	14.6	14.1	<b>12.9</b>	14.9	14.2	14.8	<b>14.6</b>	<b>13.5</b>
22	HI 8766	N-5B-22	11.6	12.5	10.9	12.2	13.6	<b>12.2</b>	12.6	13.3	14.3	<b>13.4</b>	<b>12.6</b>
23	HI 8763	N-5B-23	13.3	12.0	10.4	11.1	14.6	<b>12.3</b>	15.8	13.2	14.3	<b>14.4</b>	<b>13.1</b>
24	GW 1317	N-5B-24	12.9	11.8	11.2	12.1	15.1	<b>12.6</b>	15.7	15.2	14.7	<b>15.2</b>	<b>13.6</b>
25	DDW 33	N-5B-25	11.7	10.4	10.3	11.5	13.3	<b>11.4</b>	12.1	14.4	13.3	<b>13.3</b>	<b>12.1</b>
	<b>Mean</b>		<b>12.5</b>	<b>11.5</b>	<b>10.9</b>	<b>13.3</b>	<b>14.2</b>	<b>12.5</b>	<b>13.6</b>	<b>13.4</b>	<b>14.1</b>	<b>13.7</b>	<b>12.9</b>

**Table 36: Sedimentation value (ml) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	32	34	35	32	32	<b>33</b>	32	34	33	<b>33</b>	<b>33</b>
2	GW 1313	N-5B-02	19	22	22	19	23	<b>21</b>	20	17	19	<b>19</b>	<b>20</b>
3	RKD 268	N-5B-03	29	31	31	32	33	<b>31</b>	31	33	34	<b>33</b>	<b>32</b>
4	HI 8764	N-5B-04	21	21	22	26	25	<b>23</b>	22	25	25	<b>24</b>	<b>23</b>
5	RKD 270	N-5B-05	36	35	36	31	36	<b>35</b>	36	38	35	<b>36</b>	<b>35</b>
6	MACS 3972	N-5B-06	30	33	34	34	35	<b>33</b>	34	36	37	<b>36</b>	<b>34</b>
7	HI 8762	N-5B-07	34	36	36	30	34	<b>34</b>	33	34	35	<b>34</b>	<b>34</b>
8	MACS 3970	N-5B-08	31	30	31	30	33	<b>31</b>	33	35	37	<b>35</b>	<b>33</b>
9	HI 8765	N-5B-09	39	37	36	37	33	<b>36</b>	37	40	41	<b>39</b>	<b>38</b>
10	MPO 1294	N-5B-10	29	24	29	31	29	<b>28</b>	29	30	33	<b>31</b>	<b>29</b>
11	DDW 34	N-5B-11	33	33	32	37	32	<b>33</b>	31	34	35	<b>33</b>	<b>33</b>
12	GW 1316	N-5B-12	22	21	23	21	25	<b>22</b>	23	26	26	<b>25</b>	<b>23</b>
13	NIDW 765	N-5B-13	16	17	17	20	21	<b>18</b>	19	20	20	<b>20</b>	<b>19</b>
14	GW 1315	N-5B-14	22	23	22	27	28	<b>24</b>	27	26	27	<b>27</b>	<b>25</b>
15	MACS 4020	N-5B-15	19	22	22	21	27	<b>22</b>	23	27	20	<b>23</b>	<b>23</b>
16	MPO 1295	N-5B-16	34	41	37	40	33	<b>37</b>	34	37	38	<b>36</b>	<b>37</b>
17	KD 1318	N-5B-17	33	31	36	36	35	<b>34</b>	35	34	38	<b>36</b>	<b>35</b>
18	AKDW 2997-16 (C)	N-5B-18	31	34	34	31	32	<b>32</b>	31	35	39	<b>35</b>	<b>33</b>
19	UAS 454	N-5B-19	30	33	32	32	32	<b>32</b>	31	35	32	<b>33</b>	<b>32</b>
20	HI 8627 (c)	N-5B-20	24	28	25	23	26	<b>25</b>	27	30	28	<b>28</b>	<b>26</b>
21	GW 1314	N-5B-21	24	24	28	24	24	<b>25</b>	26	26	28	<b>27</b>	<b>26</b>
22	HI 8766	N-5B-22	31	33	34	32	34	<b>33</b>	32	35	36	<b>34</b>	<b>33</b>
23	HI 8763	N-5B-23	32	39	35	32	33	<b>34</b>	31	34	35	<b>33</b>	<b>34</b>
24	GW 1317	N-5B-24	23	24	25	25	26	<b>25</b>	26	29	27	<b>27</b>	<b>26</b>
25	DDW 33	N-5B-25	32	35	35	33	33	<b>34</b>	32	37	39	<b>36</b>	<b>35</b>
	<b>Mean</b>		<b>28</b>	<b>30</b>	<b>30</b>	<b>29</b>	<b>30</b>	<b>29</b>	<b>29</b>	<b>31</b>	<b>32</b>	<b>31</b>	<b>30</b>

**Table 37: Yellow berry incidence (%) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	37	48	36	6	8	<b>27.0</b>	2	7	28	<b>12.3</b>	<b>21.5</b>
2	GW 1313	N-5B-02	3	82	1	1	10	<b>19.4</b>	21	28	14	<b>21.0</b>	<b>20.0</b>
3	RKD 268	N-5B-03	41	85	62	3	5	<b>39.2</b>	6	4	5	<b>5.0</b>	<b>26.4</b>
4	HI 8764	N-5B-04	11	51	20	1	9	<b>18.4</b>	51	11	15	<b>25.7</b>	<b>21.1</b>
5	RKD 270	N-5B-05	11	20	27	1	7	<b>13.2</b>	2	9	11	<b>7.3</b>	<b>11.0</b>
6	MACS 3972	N-5B-06	18	52	45	8	1	<b>24.8</b>	1	22	3	<b>8.7</b>	<b>18.8</b>
7	HI 8762	N-5B-07	43	89	77	19	6	<b>46.8</b>	27	34	7	<b>22.7</b>	<b>37.8</b>
8	MACS 3970	N-5B-08	39	77	41	1	3	<b>32.2</b>	1	6	1	<b>2.7</b>	<b>21.1</b>
9	HI 8765	N-5B-09	51	57	35	1	4	<b>29.6</b>	30	32	5	<b>22.3</b>	<b>26.9</b>
10	MPO 1294	N-5B-10	20	70	11	1	10	<b>22.4</b>	12	10	4	<b>8.7</b>	<b>17.3</b>
11	DDW 34	N-5B-11	3	2	9	1	4	<b>3.8</b>	1	4	1	<b>2.0</b>	<b>3.1</b>
12	GW 1316	N-5B-12	6	38	18	5	7	<b>14.8</b>	30	10	6	<b>15.3</b>	<b>15.0</b>
13	NIDW 765	N-5B-13	17	16	36	1	5	<b>15.0</b>	9	16	3	<b>9.3</b>	<b>12.9</b>
14	GW 1315	N-5B-14	12	78	56	5	7	<b>31.6</b>	27	46	4	<b>25.7</b>	<b>29.4</b>
15	MACS 4020	N-5B-15	43	59	16	1	5	<b>24.8</b>	18	6	8	<b>10.7</b>	<b>19.5</b>
16	MPO 1295	N-5B-16	9	52	49	1	2	<b>22.6</b>	1	14	1	<b>5.3</b>	<b>16.1</b>
17	KD 1318	N-5B-17	4	7	31	1	5	<b>9.6</b>	6	2	7	<b>5.0</b>	<b>7.9</b>
18	AKDW 2997-16 (C)	N-5B-18	66	98	57	3	11	<b>47.0</b>	25	10	10	<b>15.0</b>	<b>35.0</b>
19	UAS 454	N-5B-19	2	20	14	1	1	<b>7.6</b>	5	10	5	<b>6.7</b>	<b>7.3</b>
20	HI 8627 (c)	N-5B-20	11	70	43	8	9	<b>28.2</b>	13	9	15	<b>12.3</b>	<b>22.3</b>
21	GW 1314	N-5B-21	5	67	55	9	2	<b>27.6</b>	11	18	11	<b>13.3</b>	<b>22.3</b>
22	HI 8766	N-5B-22	16	43	18	1	2	<b>16.0</b>	23	2	4	<b>9.7</b>	<b>13.6</b>
23	HI 8763	N-5B-23	50	56	66	23	4	<b>39.8</b>	10	55	4	<b>23.0</b>	<b>33.5</b>
24	GW 1317	N-5B-24	7	20	19	2	11	<b>11.8</b>	1	3	7	<b>3.7</b>	<b>8.8</b>
25	DDW 33	N-5B-25	32	47	35	49	2	<b>33.0</b>	53	37	6	<b>32.0</b>	<b>32.6</b>
	<b>Mean</b>		<b>22.3</b>	<b>52.2</b>	<b>35.1</b>	<b>6.1</b>	<b>5.6</b>	<b>24.2</b>	<b>15.4</b>	<b>16.2</b>	<b>7.4</b>	<b>13.0</b>	<b>20.0</b>



**Table 38: Yellow Pigment (ppm) of *T. durum* genotypes in NIVT-5B**

Sr. No.	Entry	Code	CZ						PZ				Overall Mean
			Dhandhuka	Indore (Rst. Irr.)	Kota (RF)	Kota (Rst. Irr.)	Powarkheda	Mean	Dharwad	Annigeri	Niphad	Mean	
1	UAS 455	N-5B-01	4.42	4.27	4.20	4.72	5.18	<b>4.56</b>	5.19	5.16	4.37	<b>4.91</b>	<b>4.69</b>
2	GW 1313	N-5B-02	3.62	3.97	4.38	4.77	4.37	<b>4.22</b>	4.45	3.89	4.84	<b>4.39</b>	<b>4.29</b>
3	RKD 268	N-5B-03	4.90	5.25	4.96	5.64	6.33	<b>5.42</b>	7.23	5.78	6.54	<b>6.52</b>	<b>5.83</b>
4	HI 8764	N-5B-04	3.32	4.56	2.27	3.60	4.49	<b>3.65</b>	4.47	3.66	3.47	<b>3.87</b>	<b>3.73</b>
5	RKD 270	N-5B-05	3.19	3.26	2.21	2.79	3.90	<b>3.07</b>	3.87	3.16	2.60	<b>3.21</b>	<b>3.12</b>
6	MACS 3972	N-5B-06	6.27	5.28	4.40	5.28	6.81	<b>5.60</b>	6.58	5.81	6.06	<b>6.15</b>	<b>5.81</b>
7	HI 8762	N-5B-07	4.77	3.67	3.10	4.31	5.00	<b>4.17</b>	6.15	4.91	4.45	<b>5.17</b>	<b>4.55</b>
8	MACS 3970	N-5B-08	5.52	5.39	4.79	5.39	5.96	<b>5.41</b>	6.38	5.52	6.23	<b>6.04</b>	<b>5.65</b>
9	HI 8765	N-5B-09	2.81	3.10	2.35	3.71	4.17	<b>3.23</b>	4.19	3.29	3.07	<b>3.52</b>	<b>3.34</b>
10	MPO 1294	N-5B-10	6.13	5.89	5.18	7.29	6.97	<b>6.29</b>	7.02	6.15	6.28	<b>6.48</b>	<b>6.36</b>
11	DDW 34	N-5B-11	6.05	6.18	5.31	6.69	7.25	<b>6.30</b>	6.55	6.23	5.59	<b>6.12</b>	<b>6.23</b>
12	GW 1316	N-5B-12	4.33	3.97	3.65	4.93	5.40	<b>4.46</b>	4.27	3.96	3.58	<b>3.94</b>	<b>4.26</b>
13	NIDW 765	N-5B-13	4.83	3.76	3.99	4.42	5.02	<b>4.40</b>	5.55	4.85	4.90	<b>5.10</b>	<b>4.67</b>
14	GW 1315	N-5B-14	3.99	2.85	3.09	5.81	5.43	<b>4.23</b>	4.18	4.00	3.63	<b>3.94</b>	<b>4.12</b>
15	MACS 4020	N-5B-15	4.67	5.23	3.92	5.37	5.27	<b>4.89</b>	5.33	4.43	4.09	<b>4.62</b>	<b>4.79</b>
16	MPO 1295	N-5B-16	3.84	3.74	3.54	4.60	4.69	<b>4.08</b>	4.03	4.89	3.60	<b>4.17</b>	<b>4.12</b>
17	KD 1318	N-5B-17	4.78	4.04	3.62	5.22	5.30	<b>4.59</b>	5.72	4.90	4.38	<b>5.00</b>	<b>4.75</b>
18	AKDW 2997-16 (C)	N-5B-18	3.53	2.52	2.14	3.56	3.81	<b>3.11</b>	3.56	3.36	2.70	<b>3.20</b>	<b>3.15</b>
19	UAS 454	N-5B-19	6.08	6.33	6.17	7.09	7.17	<b>6.57</b>	6.57	6.66	7.15	<b>6.79</b>	<b>6.65</b>
20	HI 8627 (c)	N-5B-20	6.19	4.96	6.04	6.39	6.89	<b>6.09</b>	6.40	5.42	5.44	<b>5.75</b>	<b>5.97</b>
21	GW 1314	N-5B-21	4.16	4.83	4.19	4.71	5.06	<b>4.59</b>	4.46	4.17	4.07	<b>4.24</b>	<b>4.46</b>
22	HI 8766	N-5B-22	6.17	5.52	5.49	5.86	6.39	<b>5.89</b>	6.28	6.39	5.70	<b>6.12</b>	<b>5.98</b>
23	HI 8763	N-5B-23	3.76	3.39	2.48	3.94	3.41	<b>3.40</b>	4.70	4.16	4.03	<b>4.29</b>	<b>3.73</b>
24	GW 1317	N-5B-24	2.72	2.01	2.36	2.86	3.87	<b>2.76</b>	4.49	4.04	2.39	<b>3.64</b>	<b>3.09</b>
25	DDW 33	N-5B-25	7.31	7.38	7.74	8.14	7.94	<b>7.70</b>	8.00	7.78	7.91	<b>7.90</b>	<b>7.78</b>
	<b>Mean</b>		<b>4.69</b>	<b>4.45</b>	<b>4.06</b>	<b>5.08</b>	<b>5.44</b>	<b>4.75</b>	<b>5.42</b>	<b>4.90</b>	<b>4.68</b>	<b>5.00</b>	<b>4.84</b>

### Evaluation of *T. durum* NIVT entries for HMWGS and $\gamma$ -gliadin (Table 39)

The entries in NIVT 4 and NIVT 5B including checks were analysed for  $\gamma$ -gliadin. The percent samples carrying  $\gamma$ -gliadin '45' were 91 and 76 in NIVT 4 and NIVT 5B respectively. The remaining samples had  $\gamma$ -gliadin 42 (UPD 96, GW 1309, MPO 1301 in NIVT 4 and GW 1316, NIDW 765 in NIVT 5B) and 44 (HI 8764, GW 1315, MACS 4020, GW 1317 in NIVT 5B. The variety, HD 2967 was *T.aestivum*.

**Table 39: Distribution of  $\gamma$ -gliadin in *T. durum* NIVT-4 & NIVT-5B**

No.	Variety	Code	Type of Y-gliadin	No.	Variety	Code	Type of Y-gliadin
<b>NIVT-4</b>				<b>NIVT-5B</b>			
1	PDW 341	NIVT 4-1	45	1	UAS 455	NIVT 5B-1	45
2	WHD 955	NIVT 4-2	45	2	GW 1313	NIVT 5B-2	45
3	PDW 339	NIVT 4-3	45	3	RKD 268	NIVT 5B-3	45
4	GW 1310	NIVT 4-4	45	4	HI 8764	NIVT 5B-4	44
5	HI 8759	NIVT 4-5	45	5	RKD 270	NIVT 5B-5	45
6	PDW 340	NIVT 4-6	45	6	MACS 3972	NIVT 5B-6	45
7	HI 8761	NIVT 4-7	45	7	HI 8762	NIVT 5B-7	45
8	UAS 452	NIVT 4-8	45	8	MACS 3970	NIVT 5B-8	45
9	RKD 280	NIVT 4-9	45	9	HI 8765	NIVT 5B-9	45
10	HI 8757	NIVT 4-10	45	10	MPO 1294	NIVT 5B-10	45
11	MPO1302	NIVT 4-11	45	11	DDW 34	NIVT 5B-11	45
12	UAS 453	NIVT 4-12	45	12	GW 1316	NIVT 5B-12	42
13	HI 8758	NIVT 4-13	45	13	NIDW 765	NIVT 5B-13	42
14	RKD 279	NIVT 4-14	45	14	GW 1315	NIVT 5B-14	44
15	PBND5128	NIVT 4-15	45	15	MACS 4020	NIVT 5B-15	44
16	NIDW 841	NIVT 4-16	45	16	MPO 1295	NIVT 5B-16	45
17	NIDW 842	NIVT 4-17	45	17	KD 1318	NIVT 5B-17	45
18	HI 8760	NIVT 4-18	45	18	AKDW 2997-16 (C)	NIVT 5B-18	45
19	HD 4732	NIVT 4-19	45	19	UAS 454	NIVT 5B-19	45
20	UPD 96	NIVT 4-20	42	20	HI 8627 (c)	NIVT 5B-20	45
21	PDW 342	NIVT 4-21	45	21	GW 1314	NIVT 5B-21	45
22	HD 4731	NIVT 4-22	45	22	HI 8766	NIVT 5B-22	45
23	GW 1311	NIVT 4-23	45	23	HI 8763	NIVT 5B-23	45
24	HI 8498 (C)	NIVT 4-24	45	24	GW 1317	NIVT 5B-24	44
25	HD 2967 (C)	NIVT 4-25	<b>Bread Wheat</b>	25	DDW 33	NIVT 5B-25	45
26	MACS 4024	NIVT 4-26	45				
27	DDW 31	NIVT 4-27	45				
28	GW 1308	NIVT 4-28	45				
29	MACS 3949	NIVT 4-29	45				
30	WHD 956	NIVT 4-30	45				
31	NIDW 295 (C)	NIVT 4-31	45				
32	DDW 32	NIVT 4-32	45				
33	GW 1309	NIVT 4-33	42				
34	PDW 314 (C)	NIVT 4-34	45				
35	MPO 1301	NIVT 4-35	42				
36	MACS 4023	NIVT 4-36	45				

### **Evaluation of *T.aestivum* in Northern Hill Zone IVT entries (Table 40-44)**

These trials were conducted under ITS & RTS conditions of NHZ (Almora, Shimla & Malan). There were twenty two entries tested against two checks. The entries including checks were analyzed for grain appearance score, test weight, protein content, sedimentation value and moisture content.

Under ITS condition of NHZ, ten out of twenty two entries recorded higher grain appearance score compared to the check, VL 907 (6.4) and the zonal mean was 6.4. However, only three entries outscored the check, HS 507 (6.6) under RTS condition and the zonal mean was 6.1. For test weight, twelve entries recorded >80.0 kg/hl and were found comparable to the check, HD 507 (80.5 kg/hl) and the zonal mean was 79.7 kg/hl under ITS condition. Similar was the trend in RTS condition and the zonal mean was 79.5 kg/hl. The protein contents were lower under both ITS and RTS conditions and the zonal means were 10.29% and 9.52% respectively. The entry, VL 2012 exhibited >60 ml sedimentation value in ITS and RTS conditions and the zonal means were 49 ml and 46 ml respectively. Considering the threshold value of moisture content as 12.0%, the zonal means were 11.25% and 12.26% under ITS and RTS conditions respectively.

### **Evaluation of *T.aestivum* in Southern Hill Zone IVT entries (Table 45-49)**

In SHZ, there were 14 entries tested against 3 checks. These entries were received from wellington (ITS & ILS), Ooty & Kodaikanal and analysed for quality parameters as mentioned above in case of NHZ. The entry, HW 5801 recorded >7.0 grain appearance score and was found better than the check, COW (W) 1 (6.6) and the zonal mean was 6.4. For test weight, five out of fourteen entries exhibited higher value compared to the check, COW (W) 1 (79.0 kg/hl) and the zonal mean was 79.7 kg/hl. Six entries recorded >13.0% protein content and were found comparable to the check, HW 5216 (13.25%). The zonal mean was 12.87%. The entries, HW 3607 (63ml) and HW 3627 (51 ml) outscored the check, COW (W) 1 (46 ml) in sedimentation value and the zonal mean was 42 ml. Considering the threshold value of moisture content as 12.0%, five entries did not fulfil this requirement and the zonal mean was 11.96%.

**Table 40: Grain appearance (Max-10) of *T.aestivum* genotypes in Northern Hills Zone IVT**

Sr. No.	ENTRY	Code	ALMORA	SHIMLA	MALAN	MEAN
<b>Irrigated, Timely Sown</b>						
1.	VL 907 (C)	10	6.3	6.5	6.4	6.4
2.	HS 507 (C)	22	6.2	6.1	6.5	6.3
3.	HS 581	14	6.1	7.3	7.2	6.9
4.	HS 582	18	6.3	6.5	6.3	6.4
5.	HS 583	17	5.8	6.3	6.7	6.3
6.	HS 584	12	6.4	6.3	7.4	6.7
7.	HS 585	23	6.1	6.0	7.3	6.5
8.	HS 586	21	6.5	7.3	7.2	7.0
9.	HS 587	19	6.3	7.2	7.4	7.0
10.	HPW 403	24	6.0	5.8	5.8	5.9
11.	HPW 404	09	5.8	6.0	5.9	5.9
12.	HPW 405	07	6.0	5.9	6.0	6.0
13.	HPW 406	02	5.0	6.0	5.9	5.6
14.	HPW 407	16	5.7	6.8	6.2	6.2
15.	HPW 408	06	5.8	6.5	6.2	6.2
16.	HPW 409	03	5.3	7.6	6.0	6.3
17.	VL 2007	04	5.9	7.5	6.0	6.5
18.	VL 2008	20	6.4	7.5	7.0	7.0
19.	VL 2009	01	5.2	6.2	6.5	6.0
20.	VL 2010	13	6.5	6.7	6.7	6.6
21.	VL 2011	15	6.3	6.9	6.0	6.4
22.	VL 2012	11	6.3	7.2	7.0	6.8
23.	UP 2888	05	6.0	7.8	6.2	6.7
24.	UP 2889	08	5.7	6.4	6.5	6.2
	<b>Mean</b>		<b>6.0</b>	<b>6.7</b>	<b>6.5</b>	<b>6.4</b>
<b>Rainfed, Timely Sown</b>						
1.	VL 907 (C)	10	6.7	5.9	5.6	6.1
2.	HS 507 (C)	22	7.1	6.1	6.6	6.6
3.	HS 581	14	6.6	6.4	5.7	6.2
4.	HS 582	18	5.9	5.9	6.2	6.0
5.	HS 583	17	6.0	5.8	6.4	6.1
6.	HS 584	12	6.2	5.8	5.6	5.9
7.	HS 585	23	6.0	5.8	5.8	5.9
8.	HS 586	21	7.2	7.4	7.0	7.2
9.	HS 587	19	6.6	6.8	6.6	6.7
10.	HPW 403	24	6.3	6.8	5.9	6.3
11.	HPW 404	09	6.5	5.3	5.5	5.8
12.	HPW 405	07	5.9	5.4	5.8	5.7
13.	HPW 406	02	5.7	5.0	5.7	5.5
14.	HPW 407	16	6.2	6.0	5.6	5.9
15.	HPW 408	06	6.1	5.4	5.9	5.8
16.	HPW 409	03	6.4	5.6	5.8	5.9
17.	VL 2007	04	6.6	6.0	6.2	6.3
18.	VL 2008	20	6.9	6.6	6.8	6.8
19.	VL 2009	01	6.0	5.2	5.8	5.7
20.	VL 2010	13	6.4	6.0	5.8	6.1
21.	VL 2011	15	6.3	5.7	5.8	5.9
22.	VL 2012	11	6.4	6.0	5.9	6.1
23.	UP 2888	05	7.2	6.2	6.4	6.6
24.	UP 2889	08	6.7	5.7	5.5	6.0
	<b>Mean</b>		<b>6.4</b>	<b>6.0</b>	<b>6.0</b>	<b>6.1</b>

**Table 41: Test Weight (kg/hl) of *T.aestivum* genotypes in Northern Hills Zone IVT**

<b>Sr. No.</b>	<b>ENTRY</b>	<b>Code</b>	<b>ALMORA</b>	<b>SHIMLA</b>	<b>MALAN</b>	<b>MEAN</b>
<b>Irrigated, Timely Sown</b>						
1.	VL 907 (C)	10	78.5	80.0	79.5	<b>79.3</b>
2.	HS 507 (C)	22	78.5	82.0	81.0	<b>80.5</b>
3.	HS 581	14	78.0	82.0	79.3	<b>79.8</b>
4.	HS 582	18	79.2	81.3	80.0	<b>80.2</b>
5.	HS 583	17	80.0	81.0	81.4	<b>80.8</b>
6.	HS 584	12	79.0	80.6	81.0	<b>80.2</b>
7.	HS 585	23	80.0	81.5	81.0	<b>80.8</b>
8.	HS 586	21	80.0	82.4	82.0	<b>81.5</b>
9.	HS 587	19	81.5	83.0	83.0	<b>82.5</b>
10.	HPW 403	24	77.0	79.2	79.5	<b>78.6</b>
11.	HPW 404	09	75.4	77.5	77.3	<b>76.7</b>
12.	HPW 405	07	76.0	78.2	79.0	<b>77.7</b>
13.	HPW 406	02	72.0	79.0	68.0	<b>73.0</b>
14.	HPW 407	16	76.3	81.7	79.0	<b>79.0</b>
15.	HPW 408	06	76.5	79.5	79.0	<b>78.3</b>
16.	HPW 409	03	78.0	81.6	81.0	<b>80.2</b>
17.	VL 2007	04	80.4	83.4	83.0	<b>82.3</b>
18.	VL 2008	20	78.4	82.0	79.5	<b>80.0</b>
19.	VL 2009	01	75.6	78.2	80.0	<b>77.9</b>
20.	VL 2010	13	80.4	81.5	79.5	<b>80.5</b>
21.	VL 2011	15	78.0	81.3	80.0	<b>79.8</b>
22.	VL 2012	11	79.2	83.1	82.0	<b>81.4</b>
23.	UP 2888	05	80.3	83.0	82.2	<b>81.8</b>
24.	UP 2889	08	79.0	81.0	82.0	<b>80.7</b>
	<b>Mean</b>		<b>78.2</b>	<b>81.0</b>	<b>80.0</b>	<b>79.7</b>
<b>Rainfed, Timely Sown</b>						
1.	VL 907 (C)	10	79.0	80.3	75.6	<b>78.3</b>
2.	HS 507 (C)	22	81.0	81.3	79.4	<b>80.6</b>
3.	HS 581	14	79.4	81.6	78.6	<b>79.9</b>
4.	HS 582	18	80.3	81.0	80.2	<b>80.5</b>
5.	HS 583	17	81.0	80.5	79.0	<b>80.2</b>
6.	HS 584	12	79.0	80.0	76.7	<b>78.6</b>
7.	HS 585	23	80.6	80.6	79.0	<b>80.1</b>
8.	HS 586	21	82.0	83.0	80.6	<b>81.9</b>
9.	HS 587	19	82.3	83.0	80.4	<b>81.9</b>
10.	HPW 403	24	78.0	81.0	77.0	<b>78.7</b>
11.	HPW 404	09	77.5	78.0	73.6	<b>76.4</b>
12.	HPW 405	07	76.5	77.5	74.0	<b>76.0</b>
13.	HPW 406	02	73.0	79.2	76.5	<b>76.2</b>
14.	HPW 407	16	79.0	81.0	76.4	<b>78.8</b>
15.	HPW 408	06	78.0	78.6	76.5	<b>77.7</b>
16.	HPW 409	03	81.5	80.0	78.0	<b>79.8</b>
17.	VL 2007	04	82.0	83.0	81.4	<b>82.1</b>
18.	VL 2008	20	80.6	82.5	79.6	<b>80.9</b>
19.	VL 2009	01	78.0	76.7	76.2	<b>77.0</b>
20.	VL 2010	13	80.5	82.3	77.0	<b>79.9</b>
21.	VL 2011	15	79.0	80.7	79.4	<b>79.7</b>
22.	VL 2012	11	81.0	80.0	80.0	<b>80.3</b>
23.	UP 2888	05	82.5	83.0	81.0	<b>82.2</b>
24.	UP 2889	08	80.0	80.6	77.6	<b>79.4</b>
	<b>Mean</b>		<b>79.7</b>	<b>80.6</b>	<b>78.1</b>	<b>79.5</b>

**Table 42: Protein Content (%) of *T.aestivum* genotypes in Northern Hills Zone IVT**

<b>Sr. No.</b>	<b>ENTRY</b>	<b>Code</b>	<b>ALMORA</b>	<b>SHIMLA</b>	<b>MALAN</b>	<b>MEAN</b>
<b>Irrigated, Timely Sown</b>						
1.	VL 907 (C)	10	10.40	9.21	12.14	<b>10.58</b>
2.	HS 507 (C)	22	9.21	9.55	11.70	<b>10.15</b>
3.	HS 581	14	10.06	8.98	10.28	<b>9.77</b>
4.	HS 582	18	10.13	9.57	11.20	<b>10.30</b>
5.	HS 583	17	9.29	8.91	10.53	<b>9.58</b>
6.	HS 584	12	9.87	8.68	12.27	<b>10.27</b>
7.	HS 585	23	9.38	9.02	11.66	<b>10.02</b>
8.	HS 586	21	10.61	9.88	11.06	<b>10.52</b>
9.	HS 587	19	10.88	9.74	12.58	<b>11.07</b>
10.	HPW 403	24	9.94	9.04	11.20	<b>10.06</b>
11.	HPW 404	09	9.74	8.98	10.09	<b>9.60</b>
12.	HPW 405	07	9.44	8.80	11.89	<b>10.04</b>
13.	HPW 406	02	9.24	8.46	13.02	<b>10.24</b>
14.	HPW 407	16	9.84	9.14	12.32	<b>10.43</b>
15.	HPW 408	06	9.66	8.97	10.75	<b>9.79</b>
16.	HPW 409	03	9.17	9.44	11.64	<b>10.08</b>
17.	VL 2007	04	10.96	8.71	12.65	<b>10.77</b>
18.	VL 2008	20	11.04	9.33	13.64	<b>11.34</b>
19.	VL 2009	01	9.36	8.61	11.39	<b>9.79</b>
20.	VL 2010	13	10.45	9.67	12.11	<b>10.74</b>
21.	VL 2011	15	10.18	8.44	11.01	<b>9.88</b>
22.	VL 2012	11	10.87	10.03	11.76	<b>10.89</b>
23.	UP 2888	05	10.22	10.60	10.92	<b>10.58</b>
24.	UP 2889	08	10.15	8.64	12.74	<b>10.51</b>
	<b>Mean</b>		<b>10.00</b>	<b>9.18</b>	<b>11.69</b>	<b>10.29</b>
<b>Rainfed, Timely Sown</b>						
1.	VL 907 (C)	10	9.83	8.45	8.49	<b>8.92</b>
2.	HS 507 (C)	22	9.67	8.18	9.83	<b>9.23</b>
3.	HS 581	14	9.38	9.09	8.00	<b>8.82</b>
4.	HS 582	18	9.50	9.49	9.85	<b>9.61</b>
5.	HS 583	17	8.82	8.15	9.35	<b>8.77</b>
6.	HS 584	12	9.18	9.03	8.07	<b>8.76</b>
7.	HS 585	23	8.97	8.79	8.73	<b>8.83</b>
8.	HS 586	21	9.77	10.05	10.14	<b>9.99</b>
9.	HS 587	19	10.58	10.35	9.92	<b>10.28</b>
10.	HPW 403	24	10.94	12.50	9.89	<b>11.11</b>
11.	HPW 404	09	9.89	10.37	8.32	<b>9.53</b>
12.	HPW 405	07	9.39	8.76	9.99	<b>9.38</b>
13.	HPW 406	02	9.01	8.94	8.16	<b>8.70</b>
14.	HPW 407	16	10.18	9.20	9.86	<b>9.75</b>
15.	HPW 408	06	9.58	8.89	8.93	<b>9.13</b>
16.	HPW 409	03	9.47	8.90	10.22	<b>9.53</b>
17.	VL 2007	04	10.02	8.37	9.56	<b>9.32</b>
18.	VL 2008	20	10.69	10.74	8.55	<b>9.99</b>
19.	VL 2009	01	9.58	9.45	9.95	<b>9.66</b>
20.	VL 2010	13	9.86	9.89	9.29	<b>9.68</b>
21.	VL 2011	15	10.17	9.95	10.16	<b>10.09</b>
22.	VL 2012	11	10.08	9.37	9.93	<b>9.79</b>
23.	UP 2888	05	9.99	9.96	9.67	<b>9.87</b>
24.	UP 2889	08	10.45	8.52	10.21	<b>9.73</b>
	<b>Mean</b>		<b>9.79</b>	<b>9.39</b>	<b>9.38</b>	<b>9.52</b>

**Table 43: Sedimentation Value (ml) of *T.aestivum* genotypes in Northern Hills Zone IVT**

Sr. No.	ENTRY	Code	ALMORA	SHIMLA	MALAN	MEAN
<b>Irrigated, Timely Sown</b>						
1.	VL 907 (C)	10	41	36	43	<b>40</b>
2.	HS 507 (C)	22	43	46	46	<b>45</b>
3.	HS 581	14	51	58	50	<b>53</b>
4.	HS 582	18	55	55	46	<b>52</b>
5.	HS 583	17	51	50	60	<b>54</b>
6.	HS 584	12	49	52	54	<b>52</b>
7.	HS 585	23	57	45	58	<b>53</b>
8.	HS 586	21	55	57	56	<b>56</b>
9.	HS 587	19	54	56	50	<b>53</b>
10.	HPW 403	24	47	35	42	<b>41</b>
11.	HPW 404	09	46	38	41	<b>42</b>
12.	HPW 405	07	41	35	40	<b>39</b>
13.	HPW 406	02	42	37	50	<b>43</b>
14.	HPW 407	16	44	34	48	<b>42</b>
15.	HPW 408	06	48	36	51	<b>45</b>
16.	HPW 409	03	45	42	48	<b>45</b>
17.	VL 2007	04	44	37	52	<b>44</b>
18.	VL 2008	20	48	50	54	<b>51</b>
19.	VL 2009	01	40	35	47	<b>41</b>
20.	VL 2010	13	57	50	52	<b>53</b>
21.	VL 2011	15	49	42	57	<b>49</b>
22.	VL 2012	11	60	60	62	<b>61</b>
23.	UP 2888	05	55	49	58	<b>54</b>
24.	UP 2889	08	50	42	45	<b>46</b>
	<b>Mean</b>		<b>50</b>	<b>45</b>	<b>50</b>	<b>49</b>
<b>Rainfed, Timely Sown</b>						
1.	VL 907 (C)	10	38	37	38	<b>38</b>
2.	HS 507 (C)	22	45	38	41	<b>41</b>
3.	HS 581	14	60	54	55	<b>56</b>
4.	HS 582	18	46	53	60	<b>53</b>
5.	HS 583	17	54	41	56	<b>50</b>
6.	HS 584	12	50	47	44	<b>47</b>
7.	HS 585	23	55	38	48	<b>47</b>
8.	HS 586	21	54	59	50	<b>54</b>
9.	HS 587	19	50	52	46	<b>49</b>
10.	HPW 403	24	45	39	39	<b>41</b>
11.	HPW 404	09	46	32	38	<b>39</b>
12.	HPW 405	07	37	37	32	<b>35</b>
13.	HPW 406	02	37	37	36	<b>37</b>
14.	HPW 407	16	45	34	39	<b>39</b>
15.	HPW 408	06	40	36	45	<b>40</b>
16.	HPW 409	03	39	46	34	<b>40</b>
17.	VL 2007	04	43	37	42	<b>41</b>
18.	VL 2008	20	41	48	58	<b>49</b>
19.	VL 2009	01	36	40	46	<b>41</b>
20.	VL 2010	13	53	53	51	<b>52</b>
21.	VL 2011	15	49	45	40	<b>45</b>
22.	VL 2012	11	61	61	67	<b>63</b>
23.	UP 2888	05	51	55	51	<b>52</b>
24.	UP 2889	08	45	37	45	<b>42</b>
	<b>Mean</b>		<b>47</b>	<b>44</b>	<b>46</b>	<b>46</b>

**Table 44: Moisture Content (%) of *T.aestivum* genotypes in Northern Hills Zone IVT**

Sr. No.	ENTRY	Code	ALMORA	SHIMLA	MALAN	MEAN
<b>Irrigated, Timely Sown</b>						
1.	VL 907 (C)	10	11.21	12.76	9.94	<b>11.30</b>
2.	HS 507 (C)	22	11.17	12.98	10.13	<b>11.43</b>
3.	HS 581	14	11.40	12.62	9.91	<b>11.31</b>
4.	HS 582	18	11.28	12.68	9.57	<b>11.18</b>
5.	HS 583	17	11.64	12.13	10.33	<b>11.37</b>
6.	HS 584	12	11.15	12.83	10.20	<b>11.39</b>
7.	HS 585	23	11.35	12.59	10.26	<b>11.40</b>
8.	HS 586	21	11.40	12.89	10.33	<b>11.54</b>
9.	HS 587	19	11.15	11.97	10.55	<b>11.22</b>
10.	HPW 403	24	11.33	12.60	10.09	<b>11.34</b>
11.	HPW 404	09	11.21	12.69	10.22	<b>11.37</b>
12.	HPW 405	07	11.22	12.26	10.03	<b>11.17</b>
13.	HPW 406	02	10.53	11.99	9.76	<b>10.76</b>
14.	HPW 407	16	11.39	12.93	9.99	<b>11.44</b>
15.	HPW 408	06	11.41	12.54	9.96	<b>11.30</b>
16.	HPW 409	03	10.75	12.62	10.21	<b>11.19</b>
17.	VL 2007	04	11.87	12.67	9.57	<b>11.37</b>
18.	VL 2008	20	11.14	12.50	10.12	<b>11.25</b>
19.	VL 2009	01	10.93	12.51	9.74	<b>11.06</b>
20.	VL 2010	13	11.33	12.40	9.53	<b>11.09</b>
21.	VL 2011	15	10.90	12.55	9.71	<b>11.05</b>
22.	VL 2012	11	11.14	12.46	10.28	<b>11.29</b>
23.	UP 2888	05	11.46	12.38	9.83	<b>11.22</b>
24.	UP 2889	08	11.21	12.72	9.96	<b>11.30</b>
	<b>Mean</b>		<b>11.23</b>	<b>12.55</b>	<b>9.96</b>	<b>11.25</b>
<b>Rainfed, Timely Sown</b>						
1.	VL 907 (C)	10	12.84	12.22	11.91	<b>12.32</b>
2.	HS 507 (C)	22	12.69	11.93	12.42	<b>12.35</b>
3.	HS 581	14	12.42	12.23	12.39	<b>12.35</b>
4.	HS 582	18	12.67	11.92	11.94	<b>12.18</b>
5.	HS 583	17	12.84	11.93	12.48	<b>12.42</b>
6.	HS 584	12	12.74	11.95	12.39	<b>12.36</b>
7.	HS 585	23	12.63	12.45	12.05	<b>12.38</b>
8.	HS 586	21	12.52	12.27	11.83	<b>12.21</b>
9.	HS 587	19	12.60	11.71	11.62	<b>11.98</b>
10.	HPW 403	24	12.30	11.96	12.28	<b>12.18</b>
11.	HPW 404	09	12.73	12.49	12.10	<b>12.44</b>
12.	HPW 405	07	12.82	12.22	12.21	<b>12.42</b>
13.	HPW 406	02	12.90	12.12	11.87	<b>12.30</b>
14.	HPW 407	16	12.49	12.07	11.68	<b>12.08</b>
15.	HPW 408	06	12.81	12.66	12.24	<b>12.57</b>
16.	HPW 409	03	12.85	11.93	11.80	<b>12.19</b>
17.	VL 2007	04	12.66	12.23	11.75	<b>12.21</b>
18.	VL 2008	20	12.33	12.36	12.01	<b>12.23</b>
19.	VL 2009	01	12.68	12.23	11.57	<b>12.16</b>
20.	VL 2010	13	12.49	12.20	11.74	<b>12.14</b>
21.	VL 2011	15	12.73	11.60	11.86	<b>12.06</b>
22.	VL 2012	11	12.60	12.32	12.01	<b>12.31</b>
23.	UP 2888	05	12.85	11.44	11.94	<b>12.08</b>
24.	UP 2889	08	12.64	12.10	12.24	<b>12.33</b>
	<b>Mean</b>		<b>12.66</b>	<b>12.11</b>	<b>12.01</b>	<b>12.26</b>



**Table 45: Grain appearance (Max-10) of *T.aestivum* genotypes in Southern Hill Zone IVT**

Sr. No.	ENTRY	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikarnal	Mean
<b>Restricted, Timely Sown</b>							
1.	HOW 2044 (C)	8	6.0	5.7	6.2	6.4	<b>6.1</b>
2.	CoW (W) 1 (C)	17	6.6	5.8	6.6	7.2	<b>6.6</b>
3.	HW 5216 (C)	12	6.2	5.4	7.0	7.0	<b>6.4</b>
4.	HW 3607	10	7.4	6.2	6.8	6.8	<b>6.8</b>
5.	HW 3608	6	6.2	5.3	5.9	6.2	<b>5.9</b>
6.	HW 3620	1	6.5	5.6	5.7	6.6	<b>6.1</b>
7.	HW 3627	7	6.2	6.4	7.5	6.0	<b>6.5</b>
8.	HW 3906	11	5.8	5.6	6.9	6.9	<b>6.3</b>
9.	HW 4215-1	14	6.6	5.9	6.8	7.4	<b>6.7</b>
10.	HW 5047	15	6.7	5.4	5.8	7.5	<b>6.4</b>
11.	HW 5048	16	6.8	5.2	7.5	7.4	<b>6.7</b>
12.	HW 5049	4	5.8	5.6	5.7	5.8	<b>5.7</b>
13.	HW 5801	2	6.6	6.4	8.5	6.7	<b>7.1</b>
14.	HW 5802	9	6.6	5.8	6.6	6.6	<b>6.4</b>
15.	HS589	3	6.0	6.0	7.2	6.0	<b>6.3</b>
16.	UAS 367	13	6.4	5.7	6.8	6.6	<b>6.4</b>
17.	UAS 368	5	5.9	5.7	6.4	6.4	<b>6.1</b>
	<b>Mean</b>		<b>6.4</b>	<b>5.7</b>	<b>6.7</b>	<b>6.7</b>	<b>6.4</b>

**Table 46: Test Weight (kg/hl) of *T.aestivum* genotypes in Southern Hill Zone IVT**

Sr. No.	ENTRY	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikarnal	Mean
<b>Restricted, Timely Sown</b>							
1.	HOW 2044 (C)	8	78.6	75.6	80.0	80.0	<b>78.6</b>
2.	CoW (W) 1 (C)	17	79.3	75.0	80.6	81.0	<b>79.0</b>
3.	HW 5216 (C)	12	81.2	74.5	80.3	78.0	<b>78.5</b>
4.	HW 3607	10	79.5	78.3	79.0	82.0	<b>79.7</b>
5.	HW 3608	6	81.0	77.0	78.4	78.6	<b>78.8</b>
6.	HW 3620	1	78.0	77.5	80.0	80.0	<b>78.9</b>
7.	HW 3627	7	79.0	77.0	79.5	79.6	<b>78.8</b>
8.	HW 3906	11	79.0	77.0	81.0	82.4	<b>79.9</b>
9.	HW 4215-1	14	81.0	75.6	82.0	81.0	<b>79.9</b>
10.	HW 5047	15	79.5	75.5	79.0	80.0	<b>78.5</b>
11.	HW 5048	16	79.4	76.4	81.0	79.0	<b>79.0</b>
12.	HW 5049	4	74.3	72.5	77.0	76.2	<b>75.0</b>
13.	HW 5801	2	75.0	76.3	82.4	80.6	<b>78.6</b>
14.	HW 5802	9	81.0	78.0	80.0	79.0	<b>79.5</b>
15.	HS589	3	79.0	80.3	79.0	80.3	<b>79.7</b>
16.	UAS 367	13	80.0	74.0	81.0	80.0	<b>78.8</b>
17.	UAS 368	5	74.0	76.5	81.2	79.5	<b>77.8</b>
	<b>Mean</b>		<b>78.8</b>	<b>76.3</b>	<b>80.1</b>	<b>79.8</b>	<b>78.7</b>

**Table 47: Protein Content (%) of *T.aestivum* genotypes in Southern Hill Zone IVT**

Sr. No.	ENTRY	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikarnal	Mean
<b>Restricted, Timely Sown</b>							
1.	HOW 2044 (C)	8	12.14	12.58	12.24	12.10	<b>12.27</b>
2.	CoW (W) 1 (C)	17	11.85	13.41	12.86	12.21	<b>12.58</b>
3.	HW 5216 (C)	12	12.61	13.52	13.52	13.36	<b>13.25</b>
4.	HW 3607	10	11.76	13.41	11.49	13.51	<b>12.54</b>
5.	HW 3608	6	12.70	14.94	13.67	14.93	<b>14.06</b>
6.	HW 3620	1	12.84	13.51	12.84	13.74	<b>13.23</b>
7.	HW 3627	7	11.85	12.68	14.40	13.55	<b>13.12</b>
8.	HW 3906	11	11.38	12.88	14.05	12.08	<b>12.60</b>
9.	HW 4215-1	14	11.40	12.35	11.48	12.81	<b>12.01</b>
10.	HW 5047	15	13.18	13.55	13.09	12.86	<b>13.17</b>
11.	HW 5048	16	11.05	14.01	12.68	11.96	<b>12.43</b>
12.	HW 5049	4	11.98	12.91	13.96	11.42	<b>12.57</b>
13.	HW 5801	2	12.69	13.96	12.31	12.89	<b>12.96</b>
14.	HW 5802	9	12.52	13.09	12.73	13.49	<b>12.96</b>
15.	HS589	3	13.07	14.84	12.63	13.62	<b>13.54</b>
16.	UAS 367	13	11.35	12.71	12.96	12.58	<b>12.40</b>
17.	UAS 368	5	12.97	13.66	11.96	14.07	<b>13.17</b>
	<b>Mean</b>		<b>12.20</b>	<b>13.41</b>	<b>12.87</b>	<b>13.01</b>	<b>12.87</b>

**Table 48: Sedimentation Value (ml) of *T.aestivum* genotypes in Southern Hill Zone IVT**

Sr. No.	ENTRY	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikarnal	Mean
<b>Restricted, Timely Sown</b>							
1.	HOW 2044 (C)	8	36	50	43	46	<b>44</b>
2.	CoW (W) 1 (C)	17	43	47	45	48	<b>46</b>
3.	HW 5216 (C)	12	38	48	41	45	<b>43</b>
4.	HW 3607	10	60	66	66	61	<b>63</b>
5.	HW 3608	6	41	42	36	46	<b>41</b>
6.	HW 3620	1	30	38	38	31	<b>34</b>
7.	HW 3627	7	49	54	50	51	<b>51</b>
8.	HW 3906	11	39	49	37	50	<b>44</b>
9.	HW 4215-1	14	30	38	32	36	<b>34</b>
10.	HW 5047	15	36	38	33	36	<b>36</b>
11.	HW 5048	16	44	52	38	52	<b>47</b>
12.	HW 5049	4	36	37	29	35	<b>34</b>
13.	HW 5801	2	30	38	34	36	<b>35</b>
14.	HW 5802	9	31	40	38	38	<b>37</b>
15.	HS589	3	38	46	34	48	<b>42</b>
16.	UAS 367	13	37	49	42	42	<b>43</b>
17.	UAS 368	5	32	39	41	42	<b>39</b>
	<b>Mean</b>		<b>38</b>	<b>45</b>	<b>40</b>	<b>44</b>	<b>42</b>

**Table 49: Moisture Content (%) of *T.aestivum* genotypes in Southern Hill Zone IVT**

<b>Sr. No.</b>	<b>ENTRY</b>	<b>Code</b>	<b>Wellington (TS)</b>	<b>Wellington (LS)</b>	<b>Ooty</b>	<b>Kodaikarnal</b>	<b>Mean</b>
<b>Restricted, Timely Sown</b>							
1.	HOW 2044 (C)	8	11.13	12.04	11.53	12.14	<b>11.71</b>
2.	CoW (W) 1 (C)	17	11.14	12.31	11.96	12.00	<b>11.85</b>
3.	HW 5216 (C)	12	11.68	12.18	12.10	12.10	<b>12.02</b>
4.	HW 3607	10	11.66	12.06	12.34	12.10	<b>12.04</b>
5.	HW 3608	6	10.90	12.05	11.78	12.27	<b>11.75</b>
6.	HW 3620	1	12.24	12.35	12.42	12.50	<b>12.38</b>
7.	HW 3627	7	11.62	12.33	12.18	12.06	<b>12.05</b>
8.	HW 3906	11	11.26	12.05	12.00	12.15	<b>11.87</b>
9.	HW 4215-1	14	11.13	12.21	11.87	12.54	<b>11.94</b>
10.	HW 5047	15	11.99	12.26	11.45	12.25	<b>11.99</b>
11.	HW 5048	16	11.91	13.09	12.17	12.29	<b>12.37</b>
12.	HW 5049	4	11.52	12.17	12.01	12.13	<b>11.96</b>
13.	HW 5801	2	11.80	12.08	12.10	12.33	<b>12.08</b>
14.	HW 5802	9	11.80	12.00	11.85	12.25	<b>11.98</b>
15.	HS589	3	10.87	11.88	11.89	12.20	<b>11.71</b>
16.	UAS 367	13	11.02	12.34	12.12	12.27	<b>11.94</b>
17.	UAS 368	5	11.38	11.86	11.69	12.00	<b>11.73</b>
	<b>Mean</b>		<b>11.47</b>	<b>12.19</b>	<b>11.97</b>	<b>12.21</b>	<b>11.96</b>

# **SECTION C**

## **SPECIAL TRIALS**

- i. T. dicoccum*
- ii. Salinity/Alkalinity**
- iii. Triticale**
- iv. MABB/NIL**
- v. Wheat Biofortification**

## SPECIAL TRIALS

### (I) Dicoccum Trials (Table 1-4)

Grain samples were received from six sites and grain quality analysis included 1000-grain weight, sedimentation value, grain protein and yellow pigment contents. Site mean for 1000 grain weight varied between 40 to 46g and the best locations were Mudhol and Pune. Except Ugar, mean protein content at test sites was  $\geq 14\%$  and the best location was Kalloli (15%). Average sedimentation value at six locations ranged between 21 to 24ml. Differences among test sites were not high in yellow pigments and except Pune, the mean levels were restricted to 3.12 to 3.36ppm.

All test entries except MACS 5022 had 1000 grain weight in 44 to 46g range. Nearly 14% grain protein was observed in MACS 5040, MACSS 2971 © and HW 1098 (I). Sedimentation value was low (18ml) in 2<sup>nd</sup> year entry MACS 5022 and check MACS 2971. Highest sedimentation value was recorded in HW 1098 (I) and HW 1099. Range of yellow pigments among test entries was 2.78 to 3.43 ppm which was much lower in comparison to bread wheat check MACS 2496. Highest levels of yellow pigments were observed in DDK 1044 and DDK 1029 (3.4ppm).

### (II) Salinity/ Alkalinity Trial (Table 5-8)

The material of these entries was received from four locations namely Faizabad, Karnal, Kanpur and Hisar. This trial comprised of 7 entries including 3 checks. Among the entries, WH 1301 recorded the highest mean test weight (76.9 kg/hl) and mean grain appearance score of 5.7. DBW 154 had maximum mean protein content of 11.79 %.

### (III) Triticale Trial (Table 9-13)

Five entries and three checks received from NWPZ (Ludhiana & Delhi) were analysed for grain appearance, test weight, protein content, sedimentation value and moisture content. Four entries (except TL 2997) were found comparable to the best check and the zonal mean was 6.2. For test weight, none of the entry could record more than the best check HD 2967 (75.6 kg/hl) and the zonal mean was 74.0 kg/hl. The entry, TL 3000 (14.2%) recorded higher protein content compared to the best check, HD 2967 (13.5%) and the zonal mean was 13.1%. The highest sedimentation value was exhibited by *T.aestivum* check, HD 2967 (56 ml). However, three entries had an edge over the best *triticale* check, TL 2942 (32 ml) and the zonal mean was 34 ml. considering the threshold value of moisture content as 12.0%, all the entries including checks from both the centres fulfilled this requirement and the zonal mean was 10.3%

**Table 1: Thousand Grain Weight (gm) of Dicoccum genotypes**

Sr. No.	Variety	Code	PZ						
			Dharwad	Arabhavi	Kalloli	Ugar	Mudhol	Pune	Mean
1	MACS 5040	SPL-DIC-01	48.05	46.90	45.50	41.35	43.25	46.35	<b>45.23</b>
2	MACS 5031	SPL-DIC-02	45.55	46.20	45.10	40.75	48.75	45.95	<b>45.38</b>
3	MACS 5022*	SPL-DIC-03	39.75	42.25	41.00	35.90	40.70	41.65	<b>40.21</b>
4	DDK 1046	SPL-DIC-04	44.90	45.30	43.85	40.05	45.10	47.95	<b>44.53</b>
5	MACS 2971 (C)	SPL-DIC-05	46.70	45.25	46.80	42.70	45.05	46.20	<b>45.45</b>
6	DDK 1044	SPL-DIC-06	44.50	41.45	43.50	39.50	46.90	48.75	<b>44.10</b>
7	DDK 1042*	SPL-DIC-07	46.05	44.15	45.45	41.90	46.75	46.60	<b>45.15</b>
8	DDK 1029 (C)	SPL-DIC-08	48.35	48.45	43.60	41.55	48.20	48.00	<b>46.36</b>
9	HW 1098 (I) (C)	SPL-DIC-09	45.65	41.80	45.65	40.75	47.55	47.20	<b>44.77</b>
10	HW 1099	SPL-DIC-10	44.70	47.45	46.55	42.50	48.70	47.95	<b>46.31</b>
11	MACS 2496 (aest.) (C)	SPL-DIC-11	38.65	33.58	35.51	35.60	41.80	42.75	<b>37.98</b>
	<b>Mean</b>		<b>44.80</b>	<b>43.89</b>	<b>43.86</b>	<b>40.23</b>	<b>45.70</b>	<b>46.30</b>	<b>44.13</b>

**Table 2: Protein Content (%) of Dicoccum genotypes**

Sr. No.	Variety	Code	PZ						
			Dharwad	Arabhavi	Kalloli	Ugar	Mudhol	Pune	Mean
1	MACS 5040	SPL-DIC-01	14.8	15.0	15.8	13.4	15.8	14.8	<b>14.9</b>
2	MACS 5031	SPL-DIC-02	14.5	15.5	16.1	12.4	14.5	14.7	<b>14.6</b>
3	MACS 5022*	SPL-DIC-03	14.0	13.3	15.4	13.0	15.5	14.5	<b>14.3</b>
4	DDK 1046	SPL-DIC-04	14.9	14.6	14.7	12.5	13.0	13.2	<b>13.8</b>
5	MACS 2971 (C)	SPL-DIC-05	15.8	15.9	16.2	13.2	16.2	14.9	<b>15.4</b>
6	DDK 1044	SPL-DIC-06	14.6	13.8	14.1	12.2	14.6	13.6	<b>13.8</b>
7	DDK 1042*	SPL-DIC-07	15.4	14.3	15.7	12.9	14.6	15.1	<b>14.7</b>
8	DDK 1029 (C)	SPL-DIC-08	13.6	12.9	13.9	11.9	13.4	13.3	<b>13.2</b>
9	HW 1098 (I) (C)	SPL-DIC-09	15.9	14.9	15.7	12.6	15.9	14.5	<b>14.9</b>
10	HW 1099	SPL-DIC-10	15.2	15.2	15.4	13.5	14.6	14.9	<b>14.8</b>
11	MACS 2496 (aest.) (C)	SPL-DIC-11	12.8	13.2	12.4	12.6	13.1	13.0	<b>12.9</b>
	<b>Mean</b>		<b>14.7</b>	<b>14.4</b>	<b>15.0</b>	<b>12.7</b>	<b>14.7</b>	<b>14.2</b>	<b>14.3</b>

**Table 3: Sedimentation Value (ml) of Dicocccum genotypes**

Sr. No.	Variety	Code	PZ						Mean
			Dharwad	Arabhavi	Kalloli	Ugar	Mudhol	Pune	
1	MACS 5040	SPL-DIC-01	20	20	24	19	23	19	<b>21</b>
2	MACS 5031	SPL-DIC-02	21	19	21	18	20	18	<b>20</b>
3	MACS 5022*	SPL-DIC-03	18	16	22	18	18	16	<b>18</b>
4	DDK 1046	SPL-DIC-04	24	23	23	20	22	19	<b>22</b>
5	MACS 2971 (C)	SPL-DIC-05	23	17	19	16	20	15	<b>18</b>
6	DDK 1044	SPL-DIC-06	18	23	24	20	22	19	<b>21</b>
7	DDK 1042*	SPL-DIC-07	24	23	21	20	24	20	<b>22</b>
8	DDK 1029 (C)	SPL-DIC-08	22	22	22	19	22	19	<b>21</b>
9	HW 1098 (I) (C)	SPL-DIC-09	24	23	24	20	24	21	<b>23</b>
10	HW 1099	SPL-DIC-10	26	23	24	20	24	21	<b>23</b>
11	MACS 2496 (aest.) (C)	SPL-DIC-11	45	48	42	42	44	44	<b>44</b>
	<b>Mean</b>		<b>24</b>	<b>23</b>	<b>24</b>	<b>21</b>	<b>24</b>	<b>21</b>	<b>23</b>

**Table 4: Yellow Pigment (ppm) of Dicocccum Genotypes**

Sr. No.	Variety	Code	PZ						Mean
			Dharwad	Arabhavi	Kalloli	Ugar	Mudhol	Pune	
1	MACS 5040	SPL-DIC-01	2.73	2.98	2.85	2.72	3.14	2.26	<b>2.78</b>
2	MACS 5031	SPL-DIC-02	3.00	3.01	2.70	3.08	2.72	2.37	<b>2.81</b>
3	MACS 5022*	SPL-DIC-03	2.93	3.05	3.05	3.60	3.31	2.45	<b>3.07</b>
4	DDK 1046	SPL-DIC-04	2.77	3.51	3.12	3.22	3.03	2.53	<b>3.03</b>
5	MACS 2971 (C)	SPL-DIC-05	3.13	2.96	3.30	3.45	2.95	2.44	<b>3.04</b>
6	DDK 1044	SPL-DIC-06	3.16	3.63	3.24	3.51	3.23	3.78	<b>3.43</b>
7	DDK 1042*	SPL-DIC-07	3.18	3.26	3.44	3.17	3.03	3.40	<b>3.25</b>
8	DDK 1029 (C)	SPL-DIC-08	3.72	3.47	3.19	3.51	3.03	3.41	<b>3.39</b>
9	HW 1098 (I) (C)	SPL-DIC-09	3.20	3.44	3.21	3.39	3.14	2.77	<b>3.19</b>
10	HW 1099	SPL-DIC-10	3.03	3.23	3.03	3.18	2.68	2.76	<b>2.99</b>
11	MACS 2496 (aest.) (C)	SPL-DIC-11	3.92	3.93	4.53	4.17	4.04	3.64	<b>4.04</b>
	<b>Mean</b>		<b>3.16</b>	<b>3.32</b>	<b>3.24</b>	<b>3.36</b>	<b>3.12</b>	<b>2.89</b>	<b>3.18</b>

**Table 5: Grain Appearance Score (Max.10) of *T.aestivum* entries of Salinity/alkalinity trial**

<b>Sr. No.</b>	<b>Entry</b>	<b>Code</b>	<b>Hisar</b>	<b>Faizabad</b>	<b>Kanpur</b>	<b>Karnal</b>	<b>Mean</b>
1.	KRL 349	SPL-AST-01	5.9	5.4	5.4	5.9	<b>5.7</b>
2.	DBW 155	SPL-AST-04	5.4	5.2	4.9	5.6	<b>5.3</b>
3.	Kharchia 65( C)	SPL-AST-02	4.9	4.8	4.8	4.9	<b>4.9</b>
4.	DBW 154	SPL-AST-05	5.8	5.7	5.3	5.5	<b>5.6</b>
5.	WH 1301	SPL-AST-07	5.7	5.8	5.6	5.7	<b>5.7</b>
6.	KRL 210 ( C)	SPL-AST-03	4.9	5.9	5.4	5.5	<b>5.4</b>
7.	KRL 19 ( C)	SPL-AST-06	5.7	5.8	5.8	5.8	<b>5.8</b>
	<b>Mean</b>		<b>5.5</b>	<b>5.5</b>	<b>5.3</b>	<b>5.6</b>	<b>5.5</b>

**Table 6: Test Weight (kg/hl) of *T.aestivum* entries of Salinity/alkalinity trial**

<b>Sr. No.</b>	<b>Entry</b>	<b>Code</b>	<b>Hisar</b>	<b>Faizabad</b>	<b>Kanpur</b>	<b>Karnal</b>	<b>Mean</b>
1.	KRL 349	SPL-AST-01	73.1	76.3	75.2	81.4	<b>76.5</b>
2.	DBW 155	SPL-AST-04	71.7	72.3	69.1	79.0	<b>73.0</b>
3.	Kharchia 65( C)	SPL-AST-02	71.4	79.7	76.2	80.8	<b>77.0</b>
4.	DBW 154	SPL-AST-05	74.9	78.6	74.2	76.6	<b>76.1</b>
5.	WH 1301	SPL-AST-07	70.1	78.8	77.3	81.3	<b>76.9</b>
6.	KRL 210 ( C)	SPL-AST-03	74.8	80.9	75.4	77.6	<b>77.2</b>
7.	KRL 19 ( C)	SPL-AST-06	73.8	78.8	77.7	80.0	<b>77.6</b>
	<b>Mean</b>		<b>72.8</b>	<b>77.9</b>	<b>75.0</b>	<b>79.5</b>	<b>76.3</b>



**Table 7: Protein Content (%) of *T.aestivum* entries of Salinity/alkalinity trial**

<b>Sr. No.</b>	<b>Entry</b>	<b>Code</b>	<b>Hisar</b>	<b>Faizabad</b>	<b>Kanpur</b>	<b>Karnal</b>	<b>Mean</b>
1.	KRL 349	SPL-AST-01	10.37	14.09	10.80	8.30	<b>10.89</b>
2.	DBW 155	SPL-AST-04	12.18	12.98	12.33	8.07	<b>11.39</b>
3.	Kharchia 65( C)	SPL-AST-02	10.94	12.95	11.41	8.06	<b>10.84</b>
4.	DBW 154	SPL-AST-05	11.08	15.06	11.78	9.23	<b>11.79</b>
5.	WH 1301	SPL-AST-07	11.12	14.35	11.71	8.71	<b>11.47</b>
6.	KRL 210 ( C)	SPL-AST-03	10.37	12.89	11.30	8.67	<b>10.81</b>
7.	KRL 19 ( C)	SPL-AST-06	11.51	12.06	11.10	8.02	<b>10.67</b>
	<b>Mean</b>		11.08	13.48	11.49	8.44	11.12

**Table 8: Sedimentation value (ml) of *T.aestivum* entries of Salinity/alkalinity trial**

<b>Sr. No.</b>	<b>Entry</b>	<b>Code</b>	<b>Hisar</b>	<b>Faizabad</b>	<b>Kanpur</b>	<b>Karnal</b>	<b>Mean</b>
1.	KRL 349	SPL-AST-01	29	34	30	29	<b>31</b>
2.	DBW 155	SPL-AST-04	35	38	35	40	<b>37</b>
3.	Kharchia 65( C)	SPL-AST-02	37	38	38	40	<b>38</b>
4.	DBW 154	SPL-AST-05	30	40	34	37	<b>35</b>
5.	WH 1301	SPL-AST-07	34	33	36	40	<b>36</b>
6.	KRL 210 ( C)	SPL-AST-03	31	37	36	38	<b>36</b>
7.	KRL 19 ( C)	SPL-AST-06	33	38	37	40	<b>37</b>
	<b>Mean</b>		33	37	35	38	36

**Table 9: Grain Appearance Score (Max-10) of *Triticale* genotypes in NWPZ**

Sr. No.	Variety	Trial Code	Triticale Special Trial		
			Ludhiana	Delhi	Mean
1.	TL 2996	02	6.3	6.6	<b>6.5</b>
2.	TL 2997	08	5.7	5.4	<b>5.6</b>
3.	TL 2998	07	6.3	6.0	<b>6.2</b>
4.	TL 2999	03	6.5	6.2	<b>6.4</b>
5.	TL 3000	06	6.2	6.3	<b>6.3</b>
6.	TL 2942 (C)	01	5.9	6.5	<b>6.2</b>
7.	TL 2969 (C)	05	6.1	6.3	<b>6.2</b>
8.	HD 2967 (C)	04	5.9	6.4	<b>6.2</b>
	<b>Mean</b>		<b>6.1</b>	<b>6.2</b>	<b>6.2</b>

**Table 10: Test Weight (kg/hl) of *Triticale* genotypes in NWPZ**

Sr. No.	Variety	Trial Code	Triticale Special Trial		
			Ludhiana	Delhi	Mean
1.	TL 2996	02	71.2	75.0	<b>73.1</b>
2.	TL 2997	08	73.0	73.0	<b>73.0</b>
3.	TL 2998	07	73.0	73.0	<b>73.0</b>
4.	TL 2999	03	75.0	75.2	<b>75.1</b>
5.	TL 3000	06	72.0	74.0	<b>73.0</b>
6.	TL 2942 (C)	01	73.2	76.3	<b>74.8</b>
7.	TL 2969 (C)	05	73.5	75.6	<b>74.6</b>
8.	HD 2967 (C)	04	72.2	79.0	<b>75.6</b>
	<b>Mean</b>		<b>72.9</b>	<b>75.1</b>	<b>74.0</b>

**Table 11: Protein Content (%) of *Triticale* genotypes in NWPZ**

Sr. No.	Variety	Trial Code	Triticale Special Trial		
			Ludhiana	Delhi	Mean
1.	TL 2996	02	13.1	12.4	<b>12.8</b>
2.	TL 2997	08	14.0	13.6	<b>13.8</b>
3.	TL 2998	07	13.4	12.5	<b>13.0</b>
4.	TL 2999	03	13.2	12.9	<b>13.1</b>
5.	TL 3000	06	13.6	14.7	<b>14.2</b>
6.	TL 2942 (C)	01	12.5	12.3	<b>12.4</b>
7.	TL 2969 (C)	05	12.4	12.3	<b>12.4</b>
8.	HD 2967 (C)	04	13.1	13.9	<b>13.5</b>
	<b>Mean</b>		<b>13.2</b>	<b>13.1</b>	<b>13.1</b>

**Table 12: Sedimentation Value (ml) of *Triticale* genotypes in NWPZ**

Sr. No.	Variety	Trial Code	Triticale Special Trial		
			Ludhiana	Delhi	Mean
1.	TL 2996	02	32	35	<b>34</b>
2.	TL 2997	08	25	32	<b>29</b>
3.	TL 2998	07	25	28	<b>27</b>
4.	TL 2999	03	32	33	<b>33</b>
5.	TL 3000	06	34	35	<b>35</b>
6.	TL 2942 (C)	01	26	38	<b>32</b>
7.	TL 2969 (C)	05	28	31	<b>30</b>
8.	HD 2967 (C)	04	57	55	<b>56</b>
	<b>Mean</b>		<b>32</b>	<b>36</b>	<b>34</b>

**Table 13: Moisture Content (%) of *Triticale* genotypes in NWPZ**

Sr. No.	Variety	Trial Code	Triticale Special Trial		
			Ludhiana	Delhi	Mean
1.	TL 2996	02	9.4	11.5	<b>10.5</b>
2.	TL 2997	08	9.3	11.2	<b>10.3</b>
3.	TL 2998	07	9.9	11.6	<b>10.8</b>
4.	TL 2999	03	9.5	11.4	<b>10.5</b>
5.	TL 3000	06	9.0	11.1	<b>10.1</b>
6.	TL 2942 (C)	01	9.6	11.0	<b>10.3</b>
7.	TL 2969 (C)	05	9.1	10.8	<b>10.0</b>
8.	HD 2967 (C)	04	9.0	11.1	<b>10.1</b>
	<b>Mean</b>		<b>9.4</b>	<b>11.2</b>	<b>10.3</b>

#### **(IV) MABB/NIL Trial (Table 14-31)**

Three entries and four checks were received from three centres (Ludhiana, Delhi, Karnal) of NWPZ, Likewise, one entry and four checks were received from three centres (Kanpur, Pusa, Varanasi) of NEPZ. In CZ (Indore, Powarkheda, Vijapur) and PZ (Pune, Dharwad), two entries and four checks were received. These were analysed for grain appearance score, test weight, protein content, grain hardness index, sedimentation value and moisture content.

#### **North Western Plain Zone (NWPZ)**

Two entries, PBW 722 (PBW 343 + (Lr57/Yr40 + Lr37/Yr17) and PBW 723 (PBW 343 + (Lr57/Yr40+ Yr15) were found comparable to the best check, DPW 621-50 (5.9) in grain appearance score and the zonal mean was 5.6. No entry could surpass the best check, DPW 621-50 (78.5 kg/hl) in test weight and the zonal mean was 76.5 kg/hl. The entry, PBW 723 (13.0%) had an edge over the best check, DPW 621-50 (12.4%) and zonal mean of protein content was 12.2%. Though no entry could surpass the best check, WH 1105 (58 ml) but the entry, KB 2012-03 (PBW 343 \*6/KBRL 22) exhibited 53 ml sedimentation value and the zonal mean was 49 ml. In grain hardness index, the entry PBW 723 recorded higher value compared to the check, DPW 621-50 (67) and the zonal mean was 65. All the entries including checks fulfilled the criteria of <12.0% moisture content.

#### **North Eastern Plains Zone (NEPZ)**

The lone entry could not beat the best checks in any of the quality parameters and the zonal means for grain appearance score, test weight, protein content, sedimentation value, grain hardness index and moisture content were 5.6, 75.4 kg/hl, 12.6%, 46 ml, 69 and 10.7% respectively.

#### **Central Zone (CZ) and Peninsular Zone (PZ)**

Both the entries could not surpass the respective best checks in all the quality parameters except protein content in which the entry, HD 2932 + Lr19/Sr26 (13.1%) had an edge over the best check, HD 2932 (12.9%). The overall means (CZ and PZ combined) were 6.9, 81.6 kg/hl, 12.6%, 51 ml, 64 and 9.3% for grain appearance score, test weight, protein content, sedimentation value, grain hardness index and moisture content respectively.

**Table 14: Grain Appearance (Max-10) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	5.6	5.9	6.1	<b>5.9</b>
2.	PBW 723	05	4.4	6.7	6.7	<b>5.9</b>
3.	KB 2012-03	04	4.5	6.3	5.4	<b>5.4</b>
4.	PBW 343 (C)	03	4.8	5.8	4.6	<b>5.1</b>
5.	HD 2967 (C)	06	4.2	6.2	6.2	<b>5.5</b>
6.	DPW 621-50 (C)	01	6.0	5.7	6.0	<b>5.9</b>
7.	WH 1105 (C)	07	4.2	6.2	6.5	<b>5.6</b>
	<b>Mean</b>		<b>4.8</b>	<b>6.1</b>	<b>5.9</b>	<b>5.6</b>

**Table 15: Test Weight (kg/hl) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	75.6	79.0	78.2	77.6
2.	PBW 723	05	72.5	80.5	81.3	78.1
3.	KB 2012-03	04	71.0	79.0	74.6	74.9
4.	PBW 343 (C)	03	73.0	75.5	70.3	72.9
5.	HD 2967 (C)	06	72.0	78.6	78.4	76.3
6.	DPW 621-50 (C)	01	80.3	76.7	78.5	78.5
7.	WH 1105 (C)	07	72.5	79.0	79.4	77.0
	<b>Mean</b>		<b>73.8</b>	<b>78.3</b>	<b>77.2</b>	<b>76.5</b>

**Table 16: Protein Content (%) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	12.5	12.0	10.8	<b>11.7</b>
2.	PBW 723	05	13.1	14.2	11.7	<b>13.0</b>
3.	KB 2012-03	04	13.8	11.9	10.9	<b>12.2</b>
4.	PBW 343 (C)	03	12.6	12.3	11.2	<b>12.0</b>
5.	HD 2967 (C)	06	12.9	13.0	10.0	<b>12.0</b>
6.	DPW 621-50 (C)	01	13.1	12.9	11.1	<b>12.4</b>
7.	WH 1105 (C)	07	13.4	12.6	10.8	<b>12.3</b>
	<b>Mean</b>		<b>13.1</b>	<b>12.7</b>	<b>10.9</b>	<b>12.2</b>

**Table 17: Sedimentation Value (ml) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	41	48	58	<b>49</b>
2.	PBW 723	05	53	34	34	<b>40</b>
3.	KB 2012-03	04	54	53	52	<b>53</b>
4.	PBW 343 (C)	03	47	37	35	<b>40</b>
5.	HD 2967 (C)	06	57	50	58	<b>55</b>
6.	DPW 621-50 (C)	01	35	53	66	<b>51</b>
7.	WH 1105 (C)	07	51	60	62	<b>58</b>
	<b>Mean</b>		<b>48</b>	<b>48</b>	<b>52</b>	<b>49</b>

**Table 18: Grain Hardness Index of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	59	64	76	<b>66</b>
2.	PBW 723	05	73	65	80	<b>73</b>
3.	KB 2012-03	04	61	61	60	<b>61</b>
4.	PBW 343 (C)	03	65	63	66	<b>65</b>
5.	HD 2967 (C)	06	68	58	58	<b>61</b>
6.	DPW 621-50 (C)	01	63	72	67	<b>67</b>
7.	WH 1105 (C)	07	66	61	55	<b>61</b>
	<b>Mean</b>		<b>65</b>	<b>63</b>	<b>66</b>	<b>65</b>

**Table 19: Moisture Content (%) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Western Plain Zone**

Sr. No.	Variety	Code	Ludhiana	Delhi	Karnal	Mean
<b>Irrigated Timely Sown</b>						
1.	PBW 722	02	10.5	8.9	10.5	<b>10.0</b>
2.	PBW 723	05	9.0	9.2	10.6	<b>9.6</b>
3.	KB 2012-03	04	8.7	8.9	10.3	<b>9.3</b>
4.	PBW 343 (C)	03	8.3	8.9	10.4	<b>9.2</b>
5.	HD 2967 (C)	06	9.0	8.7	10.3	<b>9.3</b>
6.	DPW 621-50 (C)	01	9.2	9.1	10.5	<b>9.6</b>
7.	WH 1105 (C)	07	8.9	8.9	10.5	<b>9.4</b>
	<b>Mean</b>		<b>9.1</b>	<b>9.0</b>	<b>10.4</b>	<b>9.5</b>

**Table 20: Grain Appearance (Max-10) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+Lr 35+Lr 37)	01	6.8	5.3	5.2	<b>5.8</b>
2.	HUW 234 (C)	02	6.4	4.9	4.7	<b>5.3</b>
3.	HI 1563 (C)	04	6.9	5.2	5.3	<b>5.8</b>
4.	HD 2985 (C)	05	6.5	4.7	5.4	<b>5.5</b>
5.	DBW 14 (C)	03	6.5	5.0	5.4	<b>5.6</b>
	<b>Mean</b>		<b>6.6</b>	<b>5.0</b>	<b>5.2</b>	<b>5.6</b>

**Table 21: Test Weight (kg/hl) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+Lr 35+Lr 37)	01	81.8	77.0	73.5	<b>77.4</b>
2.	HUW 234 (C)	02	71.1	73.0	69.5	<b>71.2</b>
3.	HI 1563 (C)	04	81.3	79.0	73.7	<b>78.0</b>
4.	HD 2985 (C)	05	78.2	71.5	72.6	<b>74.1</b>
5.	DBW 14 (C)	03	77.6	76.0	74.5	<b>76.0</b>
	<b>Mean</b>		<b>78.0</b>	<b>75.3</b>	<b>72.8</b>	<b>75.4</b>

**Table 22: Protein Content (%) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+ Lr 35+Lr 37)	01	11.0	13.6	12.9	<b>12.5</b>
2.	HUW 234 (C)	02	11.6	14.1	13.9	<b>13.2</b>
3.	HI 1563 (C)	04	11.1	13.3	12.9	<b>12.5</b>
4.	HD 2985 (C)	05	10.3	14.4	12.4	<b>12.4</b>
5.	DBW 14 (C)	03	10.7	14.5	11.6	<b>12.3</b>
	<b>Mean</b>		<b>10.9</b>	<b>14.0</b>	<b>12.7</b>	<b>12.6</b>



**Table 23: Sedimentation Value (ml) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+Lr 35+Lr 37)	01	47	40	42	<b>43</b>
2.	HUW 234 (C)	02	43	52	44	<b>46</b>
3.	HI 1563 (C)	04	46	49	48	<b>48</b>
4.	HD 2985 (C)	05	44	44	47	<b>45</b>
5.	DBW 14 (C)	03	45	47	45	<b>46</b>
	<b>Mean</b>		<b>45</b>	<b>46</b>	<b>45</b>	<b>46</b>

**Table 24: Grain Hardness Index of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+Lr 35+Lr 37)	01	54	60	76	<b>63</b>
2.	HUW 234 (C)	02	48	70	91	<b>70</b>
3.	HI 1563 (C)	04	58	84	95	<b>79</b>
4.	HD 2985 (C)	05	54	76	68	<b>66</b>
5.	DBW 14 (C)	03	60	74	63	<b>66</b>
	<b>Mean</b>		<b>55</b>	<b>73</b>	<b>79</b>	<b>69</b>

**Table 25: Moisture Content (%) of *T.aestivum* in Special Trial (MABB/NIL Trial) in North Eastern Plain Zone**

Sr. No.	Variety	Code	Kanpur	Pusa	Varanasi	Mean
<b>Irrigated Timely Sown</b>						
1.	MMBL-283 (HUW 234+Lr 35+Lr 37)	01	9.4	10.8	11.7	<b>10.7</b>
2.	HUW 234 (C)	02	9.5	10.4	12.0	<b>10.6</b>
3.	HI 1563 (C)	04	10.0	10.6	12.1	<b>10.9</b>
4.	HD 2985 (C)	05	9.6	10.2	11.9	<b>10.6</b>
5.	DBW 14 (C)	03	9.6	10.3	11.9	<b>10.6</b>
	<b>Mean</b>		<b>9.6</b>	<b>10.5</b>	<b>11.9</b>	<b>10.7</b>

**Table 26: Grain Appearance (Max-10) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	7.5	6.3	7.4	<b>7.1</b>	6.4	6.2	<b>6.3</b>	<b>6.8</b>
2.	HD 2932 + Sr26	03	7.6	6.3	6.9	<b>6.9</b>	6.8	6.5	<b>6.7</b>	<b>6.8</b>
3.	HD 2932 (C)	06	7.3	6.2	7.5	<b>7.0</b>	6.6	6.3	<b>6.5</b>	<b>6.8</b>
4.	Raj 4083 (C)	01	7.4	6.8	7.5	<b>7.2</b>	6.9	6.2	<b>6.6</b>	<b>7.0</b>
5.	HD 2864 (C)	02	7.2	6.6	7.3	<b>7.0</b>	6.7	6.4	<b>6.6</b>	<b>6.8</b>
6.	HD 2987 (C)	04	7.8	6.4	7.6	<b>7.3</b>	6.8	6.8	<b>6.8</b>	<b>7.1</b>
	<b>Mean</b>		<b>7.5</b>	<b>6.4</b>	<b>7.4</b>	<b>7.1</b>	<b>6.7</b>	<b>6.4</b>	<b>6.6</b>	<b>6.9</b>

**Table 27: Test Weight (kg/hl) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	82.3	80.6	82.0	<b>81.6</b>	81.0	78.0	<b>79.5</b>	<b>80.8</b>
2.	HD 2932 + Sr26	03	83.3	81.3	82.4	<b>82.3</b>	81.5	77.6	<b>79.6</b>	<b>81.2</b>
3.	HD 2932 (C)	06	82.5	81.5	81.4	<b>81.8</b>	80.7	79.5	<b>80.1</b>	<b>81.1</b>
4.	Raj 4083 (C)	01	83.0	80.5	81.8	<b>81.8</b>	81.0	78.6	<b>79.8</b>	<b>81.0</b>
5.	HD 2864 (C)	02	84.3	81.5	84.2	<b>83.3</b>	82.5	82.5	<b>82.5</b>	<b>83.0</b>
6.	HD 2987 (C)	04	84.5	82.4	83.2	<b>83.4</b>	82.0	80.7	<b>81.4</b>	<b>82.6</b>
	<b>Mean</b>		<b>83.3</b>	<b>81.3</b>	<b>82.5</b>	<b>82.4</b>	<b>81.5</b>	<b>79.5</b>	<b>80.5</b>	<b>81.6</b>

**Table 28: Protein Content (%) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	12.5	12.3	12.9	<b>12.6</b>	13.2	14.6	<b>13.9</b>	<b>13.1</b>
2.	HD 2932 + Sr26	03	11.7	13.0	11.6	<b>12.1</b>	12.3	14.1	<b>13.2</b>	<b>12.6</b>
3.	HD 2932 (C)	06	11.5	12.5	12.7	<b>12.2</b>	12.6	15.0	<b>13.8</b>	<b>12.9</b>
4.	Raj 4083 (C)	01	11.7	9.1	11.7	<b>10.8</b>	12.5	14.3	<b>13.4</b>	<b>11.8</b>
5.	HD 2864 (C)	02	11.3	12.7	12.3	<b>12.1</b>	12.2	14.4	<b>13.3</b>	<b>12.6</b>
6.	HD 2987 (C)	04	11.4	12.4	12.1	<b>12.0</b>	11.7	14.6	<b>13.1</b>	<b>12.5</b>
	<b>Mean</b>		<b>11.7</b>	<b>12.0</b>	<b>12.2</b>	<b>12.0</b>	<b>12.4</b>	<b>14.5</b>	<b>13.5</b>	<b>12.6</b>

**Table 29: Sedimentation Value (ml) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	50	44	44	46	44	54	49	47
2.	HD 2932 + Sr26	03	45	45	37	42	52	58	55	47
3.	HD 2932 (C)	06	49	45	45	46	56	59	58	51
4.	Raj 4083 (C)	01	45	50	50	48	55	63	59	53
5.	HD 2864 (C)	02	50	50	43	48	53	57	55	51
6.	HD 2987 (C)	04	63	50	48	54	64	63	64	58
	<b>Mean</b>		<b>50</b>	<b>47</b>	<b>45</b>	<b>47</b>	<b>54</b>	<b>59</b>	<b>57</b>	<b>51</b>

**Table 30: Grain Hardness (ml) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	67	48	65	60	58	64	61	60
2.	HD 2932 + Sr26	03	59	45	78	61	74	71	73	65
3.	HD 2932 (C)	06	53	57	69	60	60	69	65	62
4.	Raj 4083 (C)	01	67	51	72	63	64	81	73	67
5.	HD 2864 (C)	02	56	50	68	58	67	68	68	62
6.	HD 2987 (C)	04	68	57	73	66	69	75	72	68
	<b>Mean</b>		<b>62</b>	<b>51</b>	<b>71</b>	<b>61</b>	<b>65</b>	<b>71</b>	<b>68</b>	<b>64</b>

**Table 31: Moisture Content (ml) of *T.aestivum* in Special Trial (MABB/NIL Trial) in Central Zone and Peninsular Zone**

Sr. No.	Variety	Code	CZ				PZ			Overall Mean
			Indore	Powarkheda	Vijapur	Mean	Pune	Dharwad	Mean	
<b>Irrigated Timely Sown</b>										
1.	HD 2932 + Lr19/Sr25	05	7.9	8.2	9.0	8.4	9.8	11.0	10.4	9.2
2.	HD 2932 + Sr26	03	8.0	7.9	9.2	8.4	9.9	11.3	10.6	9.2
3.	HD 2932 (C)	06	7.9	8.4	9.0	8.4	9.9	11.1	10.5	9.3
4.	Raj 4083 (C)	01	8.6	8.5	9.4	8.8	10.1	11.1	10.6	9.5
5.	HD 2864 (C)	02	7.6	8.3	9.0	8.3	9.7	11.2	10.4	9.2
6.	HD 2987 (C)	04	8.5	8.1	9.1	8.6	9.8	11.1	10.4	9.3
	<b>Mean</b>		<b>8.1</b>	<b>8.2</b>	<b>9.1</b>	<b>8.5</b>	<b>9.9</b>	<b>11.1</b>	<b>10.5</b>	<b>9.3</b>

#### **(V) Wheat Bio-fortification Trial (Table 32-39)**

Nineteen entries and three checks were received from five centres (Ludhiana, Durgapura, Delhi, Karnal, Hisar) of NWPZ, two centres (Kanpur, Varanasi) of NEPZ and one centre (Niphad) of PZ. These were analysed for processing quality parameters like grain appearance score, test weight, protein content, sedimentation value, grain hardness index and moisture content. These were also analysed for nutritional quality parameters like iron content and zinc content.

All the entries score  $\geq 6.0$  and were found comparable to the check (6.4). The overall mean was 6.2 with zonal means of 6.2 (NWPZ), 5.8 (NEPZ) and 7.6 (PZ). Two entries namely, HPBW 04 and WB1 (HYPT 414) had an edge over the best check, K 0307 (78.4 kg/hl) in test weight. The zonal means were 76.9 kg/hl, 75.3 kg/hl and 82.0 kg/hl in NWPZ, NEPZ and PZ respectively with a overall mean of 77.1 kg/hl. Four entries, HD 3176, HD 3179, HPBW 03 and HPBW 04 recorded higher protein content compared to the best check, MACS 6222 (12.8%). The overall means was 12.4%. The highest grain hardness DPW 621-50 (77) and no entry could compete with it. However, one entry, HD 3175 (22) had very low grain hardness index, hence can be an excellent material for biscuit quality. The overall mean was 64. Eleven entries gave  $>50$ . ml sedimentation value and were found comparable to the best check, DPW 621-50 (52 ml). There was not much variation in the zonal means and the overall mean was 49 ml. Many entries exhibited  $>12.0\%$  moisture content (accepted threshold value) in Delhi, Karnal, Hisar, Varanasi and Niphad. However, the overall mean was 11.7%.

Two entries, HPBW 04 and WB1 (HPYT 414) had an edge over the best check, K 0307 (42.4 ppm) in iron content. The overall mean was 41.4 ppm. For zinc content, only one entry, HPBW 04 (49.4 ppm) outscored the best check, K 0307 (42.4 ppm). The zonal means were highest in NWPZ (44.2 ppm) followed by NEPZ (34.5 ppm) & PZ (32.3 ppm) and the overall mean was 40.3 ppm.

**Table 32: Grain Appearance (Max-10) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	5.9	6.4	6.4	6.8	6.0	<b>6.3</b>	5.8	5.2	<b>5.5</b>	7.8	<b>6.3</b>
2.	HD 3176	02	4.2	6.4	6.3	6.2	5.5	<b>5.7</b>	6.1	5.9	<b>6.0</b>	8.0	<b>6.1</b>
3.	HD 3177	19	4.2	6.3	6.5	6.8	5.4	<b>5.8</b>	6.4	4.5	<b>5.5</b>	7.7	<b>6.0</b>
4.	HD 3178	21	4.2	6.5	6.5	7.2	6.0	<b>6.1</b>	6.5	5.2	<b>5.9</b>	7.8	<b>6.2</b>
5.	HD 3179	16	5.8	6.3	6.9	6.8	5.6	<b>6.3</b>	6.0	5.4	<b>5.7</b>	7.8	<b>6.3</b>
6.	HPBW 01	13	6.0	6.7	6.5	6.0	5.7	<b>6.2</b>	6.3	5.3	<b>5.8</b>	7.4	<b>6.2</b>
7.	HPBW 02	14	6.2	6.8	6.1	6.2	5.5	<b>6.2</b>	6.6	4.6	<b>5.6</b>	7.8	<b>6.2</b>
8.	HPBW 03	12	6.3	5.3	6.3	6.2	5.4	<b>5.9</b>	6.5	4.9	<b>5.7</b>	7.6	<b>6.1</b>
9.	HPBW 04	17	6.6	6.2	7.2	5.9	5.9	<b>6.4</b>	6.5	4.1	<b>5.3</b>	6.3	<b>6.1</b>
10.	HPBW 05	18	5.9	6.4	6.3	6.3	5.8	<b>6.1</b>	6.7	6.2	<b>6.5</b>	7.5	<b>6.4</b>
11.	HPBW 06	07	5.8	6.1	6.6	6.4	5.6	<b>6.1</b>	6.3	5.7	<b>6.0</b>	7.3	<b>6.2</b>
12.	HUW 694	11	5.8	5.8	6.7	7.3	6.2	<b>6.4</b>	6.4	5.3	<b>5.9</b>	7.8	<b>6.4</b>
13.	HUW 695	22	6.3	6.4	6.6	7.3	5.9	<b>6.5</b>	6.2	4.9	<b>5.6</b>	7.6	<b>6.4</b>
14.	HUW 696	04	5.6	6.4	5.6	6.0	5.3	<b>5.8</b>	5.7	5.2	<b>5.5</b>	7.6	<b>5.9</b>
15.	WBI 1 (HPYT 414)	01	6.3	6.2	7.2	6.3	6.4	<b>6.5</b>	6.5	6.2	<b>6.4</b>	7.5	<b>6.6</b>
16.	WBI 2 (HPYT 415)	06	6.6	6.5	6.3	5.9	6.0	<b>6.3</b>	5.6	6.4	<b>6.0</b>	7.4	<b>6.3</b>
17.	WBI 3 (HPYT 422)	05	5.9	6.2	6.3	6.9	6.1	<b>6.3</b>	5.9	5.4	<b>5.7</b>	7.5	<b>6.3</b>
18.	WBI 4 (HPYT 423)	03	6.0	6.2	6.7	6.3	5.7	<b>6.2</b>	6.3	5.0	<b>5.7</b>	7.4	<b>6.2</b>
19.	WBI 5 (HPYT 429)	15	5.3	6.4	6.8	6.1	5.2	<b>6.0</b>	6.3	4.9	<b>5.6</b>	7.7	<b>6.1</b>
20.	DPW 621-50 (C)	09	5.6	6.0	6.7	7.2	5.4	<b>6.2</b>	6.6	5.6	<b>6.1</b>	7.7	<b>6.4</b>
21.	K 0307 (C)	20	4.4	6.6	7.4	6.6	6.2	<b>6.2</b>	6.2	5.7	<b>6.0</b>	7.8	<b>6.4</b>
22.	MACS 6222 (C)	10	6.4	6.6	6.7	7.5	5.7	<b>6.6</b>	6.2	4.8	<b>5.5</b>	7.6	<b>6.4</b>
	<b>Mean</b>		<b>5.7</b>	<b>6.3</b>	<b>6.6</b>	<b>6.6</b>	<b>5.8</b>	<b>6.2</b>	<b>6.3</b>	<b>5.3</b>	<b>5.8</b>	<b>7.6</b>	<b>6.2</b>

**Table 33: Test Weight (kg/hl) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	75.6	78.0	77.8	81.0	76.1	<b>77.7</b>	78.5	77.4	<b>78.0</b>	82.3	<b>78.3</b>
2.	HD 3176	02	66.7	77.5	78.8	79.4	76.3	<b>75.7</b>	78.4	72.3	<b>75.4</b>	82.1	<b>76.4</b>
3.	HD 3177	19	69.9	78.3	77.6	79.6	75.1	<b>76.1</b>	78.9	70.4	<b>74.7</b>	81.6	<b>76.4</b>
4.	HD 3178	21	69.3	77.1	78.2	79.5	75.7	<b>76.0</b>	78.2	73.2	<b>75.7</b>	81.4	<b>76.6</b>
5.	HD 3179	16	69.9	78.2	77.6	78.0	74.9	<b>75.7</b>	78.0	65.6	<b>71.8</b>	82.1	<b>75.5</b>
6.	HPBW 01	13	75.4	78.3	78.6	79.7	75.7	<b>77.5</b>	76.9	72.4	<b>74.7</b>	82.5	<b>77.4</b>
7.	HPBW 02	14	77.9	77.6	75.5	79.7	75.6	<b>77.3</b>	78.4	74.3	<b>76.4</b>	82.0	<b>77.6</b>
8.	HPBW 03	12	75.5	76.5	77.0	77.4	75.0	<b>76.3</b>	75.9	73.5	<b>74.7</b>	80.6	<b>76.4</b>
9.	HPBW 04	17	80.7	78.0	81.6	78.8	79.1	<b>79.6</b>	79.5	77.4	<b>78.5</b>	81.5	<b>79.6</b>
10.	HPBW 05	18	76.3	78.0	77.7	79.8	75.4	<b>77.4</b>	75.9	70.2	<b>73.1</b>	81.6	<b>76.9</b>
11.	HPBW 06	07	74.9	78.5	76.1	79.2	73.0	<b>76.3</b>	78.7	69.6	<b>74.2</b>	83.2	<b>76.7</b>
12.	HUW 694	11	78.4	75.1	79.4	77.3	77.4	<b>77.5</b>	79.6	73.3	<b>76.5</b>	82.4	<b>77.9</b>
13.	HUW 695	22	75.4	79.3	77.7	81.3	76.8	<b>78.1</b>	78.0	72.1	<b>75.1</b>	82.1	<b>77.8</b>
14.	HUW 696	04	71.1	75.6	73.3	74.4	71.5	<b>73.2</b>	73.3	72.0	<b>72.7</b>	80.5	<b>74.0</b>
15.	WBI 1 (HPYT 414)	01	78.5	78.4	80.1	80.2	77.4	<b>78.9</b>	79.1	74.9	<b>77.0</b>	82.6	<b>78.9</b>
16.	WBI 2 (HPYT 415)	06	78.9	77.0	77.2	77.7	75.1	<b>77.2</b>	77.8	71.9	<b>74.9</b>	82.4	<b>77.3</b>
17.	WBI 3 (HPYT 422)	05	75.7	78.6	78.3	80.3	74.6	<b>77.5</b>	77.7	73.8	<b>75.8</b>	81.4	<b>77.6</b>
18.	WBI 4 (HPYT 423)	03	76.7	77.8	77.5	79.5	74.5	<b>77.2</b>	78.2	73.7	<b>76.0</b>	81.5	<b>77.4</b>
19.	WBI 5 (HPYT 429)	15	71.4	75.6	76.1	79.1	71.8	<b>74.8</b>	75.2	69.9	<b>72.6</b>	81.3	<b>75.1</b>
20.	DPW 621-50 (C)	09	73.3	78.1	77.1	80.9	74.0	<b>76.7</b>	80.3	74.0	<b>77.2</b>	82.8	<b>77.6</b>
21.	K 0307 (C)	20	71.8	78.8	79.3	78.8	75.7	<b>76.9</b>	80.5	78.7	<b>79.6</b>	83.2	<b>78.4</b>
22.	MACS 6222 (C)	10	78.0	79.4	76.4	79.3	76.0	<b>77.8</b>	74.7	71.6	<b>73.2</b>	82.2	<b>77.2</b>
	<b>Mean</b>		<b>74.6</b>	<b>77.7</b>	<b>77.7</b>	<b>79.1</b>	<b>75.3</b>	<b>76.9</b>	<b>77.8</b>	<b>72.8</b>	<b>75.3</b>	<b>82.0</b>	<b>77.1</b>

**Table 34: Protein Content (%) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	11.5	13.7	13.9	9.9	10.8	<b>12.0</b>	9.6	13.1	<b>11.4</b>	13.9	<b>12.1</b>
2.	HD 3176	02	13.9	13.3	13.6	11.2	12.4	<b>12.9</b>	11.2	14.6	<b>12.9</b>	13.2	<b>12.9</b>
3.	HD 3177	19	13.7	12.6	13.6	10.0	12.0	<b>12.4</b>	10.8	14.9	<b>12.9</b>	13.4	<b>12.6</b>
4.	HD 3178	21	13.8	12.8	13.8	11.2	12.1	<b>12.7</b>	10.9	14.1	<b>12.5</b>	14.1	<b>12.8</b>
5.	HD 3179	16	12.4	13.5	13.2	13.1	12.6	<b>13.0</b>	10.8	14.7	<b>12.8</b>	13.4	<b>13.0</b>
6.	HPBW 01	13	11.5	12.7	13.8	9.5	11.1	<b>11.7</b>	9.7	12.9	<b>11.3</b>	11.1	<b>11.5</b>
7.	HPBW 02	14	11.4	12.7	13.2	10.8	12.6	<b>12.1</b>	10.4	13.1	<b>11.8</b>	14.5	<b>12.3</b>
8.	HPBW 03	12	12.3	14.5	14.3	10.2	13.3	<b>12.9</b>	11.8	13.9	<b>12.8</b>	14.2	<b>13.0</b>
9.	HPBW 04	17	12.3	16.3	15.8	10.3	15.9	<b>14.1</b>	11.4	16.2	<b>13.8</b>	13.4	<b>14.0</b>
10.	HPBW 05	18	10.8	13.1	13.6	11.5	11.7	<b>12.1</b>	9.3	13.3	<b>11.3</b>	14.6	<b>12.2</b>
11.	HPBW 06	07	10.4	12.3	12.4	10.5	11.4	<b>11.4</b>	9.6	13.5	<b>11.5</b>	13.8	<b>11.7</b>
12.	HUW 694	11	11.4	13.5	14.0	12.3	11.6	<b>12.6</b>	10.9	14.0	<b>12.5</b>	14.6	<b>12.8</b>
13.	HUW 695	22	11.6	12.5	14.1	9.7	12.2	<b>12.0</b>	10.4	13.6	<b>12.0</b>	12.4	<b>12.1</b>
14.	HUW 696	04	12.5	12.4	13.6	11.2	13.0	<b>12.5</b>	12.0	13.6	<b>12.8</b>	13.6	<b>12.7</b>
15.	WBI 1 (HPYT 414)	01	12.0	12.6	13.6	10.1	12.3	<b>12.1</b>	9.8	13.1	<b>11.4</b>	13.0	<b>12.0</b>
16.	WBI 2 (HPYT 415)	06	11.3	12.9	14.0	11.6	12.7	<b>12.5</b>	11.4	14.4	<b>12.9</b>	13.6	<b>12.7</b>
17.	WBI 3 (HPYT 422)	05	12.2	11.1	14.9	10.4	12.1	<b>12.1</b>	10.2	13.0	<b>11.6</b>	14.3	<b>12.3</b>
18.	WBI 4 (HPYT 423)	03	10.4	12.9	13.6	10.9	11.9	<b>11.9</b>	10.2	13.2	<b>11.7</b>	13.8	<b>12.1</b>
19.	WBI 5 (HPYT 429)	15	12.6	11.9	13.2	9.7	13.2	<b>12.1</b>	9.9	12.9	<b>11.4</b>	13.1	<b>12.0</b>
20.	DPW 621-50 (C)	09	12.4	13.3	13.5	10.5	12.4	<b>12.4</b>	10.5	13.4	<b>11.9</b>	13.1	<b>12.4</b>
21.	K 0307 (C)	20	11.2	12.6	13.1	10.3	11.4	<b>11.7</b>	9.3	12.5	<b>10.9</b>	13.0	<b>11.7</b>
22.	MACS 6222 (C)	10	10.8	13.3	13.1	14.4	11.4	<b>12.6</b>	12.0	13.7	<b>12.9</b>	13.8	<b>12.8</b>
	<b>Mean</b>		<b>11.9</b>	<b>13.0</b>	<b>13.7</b>	<b>10.9</b>	<b>12.3</b>	<b>12.4</b>	<b>10.5</b>	<b>13.7</b>	<b>12.1</b>	<b>13.5</b>	<b>12.4</b>

**Table 35: Sedimentation Value (ml) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	48	40	44	57	49	<b>48</b>	50	58	<b>54</b>	42	<b>49</b>
2.	HD 3176	02	43	35	43	38	44	<b>41</b>	43	40	<b>42</b>	52	<b>42</b>
3.	HD 3177	19	37	40	55	40	44	<b>43</b>	45	45	<b>45</b>	58	<b>46</b>
4.	HD 3178	21	36	40	40	38	42	<b>39</b>	47	47	<b>47</b>	53	<b>43</b>
5.	HD 3179	16	40	50	50	52	57	<b>50</b>	52	56	<b>54</b>	41	<b>50</b>
6.	HPBW 01	13	50	55	45	49	61	<b>52</b>	59	56	<b>58</b>	55	<b>54</b>
7.	HPBW 02	14	52	53	50	48	43	<b>49</b>	50	57	<b>54</b>	57	<b>51</b>
8.	HPBW 03	12	48	43	50	42	45	<b>46</b>	44	42	<b>43</b>	54	<b>46</b>
9.	HPBW 04	17	38	30	43	32	34	<b>35</b>	45	37	<b>41</b>	40	<b>37</b>
10.	HPBW 05	18	49	53	52	56	59	<b>54</b>	58	53	<b>56</b>	55	<b>54</b>
11.	HPBW 06	07	54	50	52	53	54	<b>53</b>	58	58	<b>58</b>	47	<b>53</b>
12.	HUW 694	11	52	51	60	55	59	<b>55</b>	62	55	<b>59</b>	59	<b>57</b>
13.	HUW 695	22	50	49	54	55	61	<b>54</b>	55	59	<b>57</b>	57	<b>55</b>
14.	HUW 696	04	50	43	50	43	46	<b>46</b>	50	50	<b>50</b>	58	<b>49</b>
15.	WBI 1 (HPYT 414)	01	50	54	45	48	60	<b>51</b>	50	56	<b>53</b>	42	<b>51</b>
16.	WBI 2 (HPYT 415)	06	55	52	48	48	52	<b>51</b>	52	57	<b>55</b>	49	<b>52</b>
17.	WBI 3 (HPYT 422)	05	52	53	58	52	60	<b>55</b>	56	56	<b>56</b>	55	<b>55</b>
18.	WBI 4 (HPYT 423)	03	48	50	50	49	62	<b>52</b>	54	67	<b>61</b>	63	<b>55</b>
19.	WBI 5 (HPYT 429)	15	42	40	55	43	48	<b>46</b>	50	44	<b>47</b>	45	<b>46</b>
20.	DPW 621-50 (C)	09	50	52	44	57	59	<b>52</b>	50	58	<b>54</b>	42	<b>52</b>
21.	K 0307 (C)	20	32	38	45	32	36	<b>37</b>	44	38	<b>41</b>	40	<b>38</b>
22.	MACS 6222 (C)	10	39	38	45	40	47	<b>42</b>	41	42	<b>42</b>	38	<b>41</b>
	<b>Mean</b>		<b>46</b>	<b>46</b>	<b>49</b>	<b>47</b>	<b>51</b>	<b>48</b>	<b>51</b>	<b>51</b>	<b>51</b>	<b>50</b>	<b>49</b>



**Table 36: Grain Hardness Index of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	21	16	28	32	19	<b>23</b>	15	22	<b>19</b>	21	<b>22</b>
2.	HD 3176	02	81	63	67	69	62	<b>68</b>	73	78	<b>76</b>	58	<b>69</b>
3.	HD 3177	19	83	76	68	67	58	<b>70</b>	69	87	<b>78</b>	58	<b>71</b>
4.	HD 3178	21	79	62	72	74	50	<b>67</b>	70	86	<b>78</b>	57	<b>69</b>
5.	HD 3179	16	69	72	71	75	53	<b>68</b>	77	77	<b>77</b>	70	<b>71</b>
6.	HPBW 01	13	49	49	69	53	49	<b>54</b>	58	68	<b>63</b>	68	<b>58</b>
7.	HPBW 02	14	53	44	62	74	59	<b>58</b>	62	66	<b>64</b>	66	<b>61</b>
8.	HPBW 03	12	61	56	58	68	62	<b>61</b>	87	72	<b>80</b>	57	<b>65</b>
9.	HPBW 04	17	48	52	39	56	47	<b>48</b>	66	65	<b>66</b>	62	<b>54</b>
10.	HPBW 05	18	59	56	64	65	43	<b>57</b>	65	79	<b>72</b>	65	<b>62</b>
11.	HPBW 06	07	57	50	75	72	48	<b>60</b>	49	90	<b>70</b>	84	<b>66</b>
12.	HUW 694	11	59	46	69	61	47	<b>56</b>	69	77	<b>73</b>	76	<b>63</b>
13.	HUW 695	22	57	63	64	63	51	<b>60</b>	67	78	<b>73</b>	72	<b>64</b>
14.	HUW 696	04	72	68	71	73	64	<b>70</b>	87	82	<b>85</b>	77	<b>74</b>
15.	WBI 1 (HPYT 414)	01	61	57	76	60	52	<b>61</b>	56	77	<b>67</b>	78	<b>65</b>
16.	WBI 2 (HPYT 415)	06	63	66	69	61	57	<b>63</b>	67	76	<b>72</b>	92	<b>69</b>
17.	WBI 3 (HPYT 422)	05	57	45	62	63	52	<b>56</b>	60	71	<b>66</b>	64	<b>59</b>
18.	WBI 4 (HPYT 423)	03	61	47	87	67	52	<b>63</b>	62	85	<b>74</b>	64	<b>66</b>
19.	WBI 5 (HPYT 429)	15	71	65	64	77	62	<b>68</b>	72	88	<b>80</b>	64	<b>70</b>
20.	DPW 621-50 (C)	09	82	61	89	73	64	<b>74</b>	73	90	<b>82</b>	83	<b>77</b>
21.	K 0307 (C)	20	73	53	81	73	47	<b>65</b>	75	68	<b>72</b>	63	<b>67</b>
22.	MACS 6222 (C)	10	67	51	67	80	48	<b>63</b>	85	90	<b>88</b>	68	<b>70</b>
	<b>Mean</b>		<b>63</b>	<b>55</b>	<b>67</b>	<b>66</b>	<b>52</b>	<b>61</b>	<b>67</b>	<b>76</b>	<b>71</b>	<b>67</b>	<b>64</b>

**Table 37: Moisture Content (%) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	11.0	10.7	12.2	12.4	12.1	<b>11.7</b>	10.0	12.0	<b>11.0</b>	12.3	<b>11.6</b>
2.	HD 3176	02	11.3	10.6	12.0	12.4	11.8	<b>11.6</b>	10.5	12.2	<b>11.4</b>	12.4	<b>11.7</b>
3.	HD 3177	19	11.1	10.8	11.8	12.3	12.4	<b>11.7</b>	10.5	12.2	<b>11.4</b>	12.2	<b>11.7</b>
4.	HD 3178	21	11.1	11.0	11.8	12.3	12.1	<b>11.7</b>	10.5	12.2	<b>11.4</b>	12.5	<b>11.7</b>
5.	HD 3179	16	11.3	10.9	12.0	12.4	12.3	<b>11.8</b>	10.5	12.1	<b>11.3</b>	12.4	<b>11.7</b>
6.	HPBW 01	13	11.4	10.7	11.6	12.2	11.9	<b>11.6</b>	10.7	12.5	<b>11.6</b>	12.5	<b>11.7</b>
7.	HPBW 02	14	11.3	10.7	11.6	12.3	11.8	<b>11.5</b>	10.5	12.5	<b>11.5</b>	12.3	<b>11.6</b>
8.	HPBW 03	12	11.1	10.6	11.3	12.3	11.7	<b>11.4</b>	10.4	12.4	<b>11.4</b>	12.4	<b>11.5</b>
9.	HPBW 04	17	11.3	10.5	11.8	12.2	11.5	<b>11.5</b>	10.6	12.2	<b>11.4</b>	12.2	<b>11.5</b>
10.	HPBW 05	18	11.3	10.9	11.7	12.4	12.1	<b>11.7</b>	10.7	12.3	<b>11.5</b>	12.3	<b>11.7</b>
11.	HPBW 06	07	11.1	10.7	11.9	12.8	11.9	<b>11.7</b>	10.2	12.3	<b>11.3</b>	12.5	<b>11.7</b>
12.	HUW 694	11	11.3	11.1	11.9	12.2	12.1	<b>11.7</b>	10.6	12.4	<b>11.5</b>	12.6	<b>11.8</b>
13.	HUW 695	22	11.2	11.0	11.6	12.7	12.0	<b>11.7</b>	10.6	12.1	<b>11.4</b>	12.7	<b>11.7</b>
14.	HUW 696	04	10.9	10.9	12.0	12.5	12.0	<b>11.7</b>	10.6	12.0	<b>11.3</b>	12.5	<b>11.7</b>
15.	WBI 1 (HPYT 414)	01	11.5	10.8	11.9	12.6	12.2	<b>11.8</b>	10.8	12.1	<b>11.5</b>	12.2	<b>11.8</b>
16.	WBI 2 (HPYT 415)	06	11.4	11.0	12.1	12.5	11.8	<b>11.7</b>	10.5	12.1	<b>11.3</b>	12.7	<b>11.7</b>
17.	WBI 3 (HPYT 422)	05	11.3	11.0	11.9	12.5	12.1	<b>11.8</b>	10.7	12.0	<b>11.3</b>	12.3	<b>11.7</b>
18.	WBI 4 (HPYT 423)	03	11.3	11.1	11.7	12.7	12.1	<b>11.8</b>	10.7	12.3	<b>11.5</b>	12.3	<b>11.8</b>
19.	WBI 5 (HPYT 429)	15	11.1	11.0	11.7	12.3	11.8	<b>11.6</b>	10.7	12.4	<b>11.6</b>	12.3	<b>11.6</b>
20.	DPW 621-50 (C)	09	11.2	10.9	12.0	12.0	12.1	<b>11.6</b>	10.6	12.1	<b>11.4</b>	12.4	<b>11.7</b>
21.	K 0307 (C)	20	11.2	10.7	12.2	11.9	12.1	<b>11.6</b>	10.7	12.5	<b>11.6</b>	12.3	<b>11.7</b>
22.	MACS 6222 (C)	10	11.0	10.7	12.0	11.9	12.1	<b>11.5</b>	10.5	12.3	<b>11.4</b>	12.4	<b>11.6</b>
	<b>Mean</b>		<b>11.2</b>	<b>10.8</b>	<b>11.8</b>	<b>12.4</b>	<b>12.0</b>	<b>11.6</b>	<b>10.6</b>	<b>12.2</b>	<b>11.4</b>	<b>12.4</b>	<b>11.7</b>

**Table 38: Iron Content (ppm) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	36.2	42.3	45.1	42.3	49.8	<b>43.1</b>	45.0	37.7	<b>41.4</b>	47.1	<b>43.2</b>
2.	HD 3176	02	33.5	38.4	40.9	40.9	47.2	<b>40.2</b>	40.2	37.8	<b>39.0</b>	42.0	<b>40.1</b>
3.	HD 3177	19	35.4	41.3	43.9	38.0	51.3	<b>42.0</b>	41.8	36.7	<b>39.3</b>	42.6	<b>41.4</b>
4.	HD 3178	21	33.7	41.4	41.6	42.2	46.0	<b>41.0</b>	42.4	40.2	<b>41.3</b>	44.9	<b>41.6</b>
5.	HD 3179	16	34.1	41.5	37.4	35.2	42.6	<b>38.2</b>	37.6	40.3	<b>39.0</b>	43.5	<b>39.0</b>
6.	HPBW 01	13	37.4	43.8	40.8	40.3	49.1	<b>42.3</b>	39.2	42.0	<b>40.6</b>	39.5	<b>41.5</b>
7.	HPBW 02	14	37.5	42.7	38.5	40.3	44.9	<b>40.8</b>	41.4	38.3	<b>39.9</b>	49.0	<b>41.6</b>
8.	HPBW 03	12	37.2	42.1	42.0	39.6	49.4	<b>42.1</b>	38.4	38.0	<b>38.2</b>	44.9	<b>41.5</b>
9.	HPBW 04	17	40.2	46.3	46.6	45.9	57.2	<b>47.2</b>	41.9	37.9	<b>39.9</b>	46.0	<b>45.3</b>
10.	HPBW 05	18	35.1	46.0	39.8	37.5	45.6	<b>40.8</b>	37.9	47.5	<b>42.7</b>	45.1	<b>41.8</b>
11.	HPBW 06	07	33.5	39.2	36.0	35.4	43.9	<b>37.6</b>	36.1	38.8	<b>37.5</b>	42.5	<b>38.2</b>
12.	HUW 694	11	38.2	43.9	43.6	40.3	46.2	<b>42.4</b>	39.7	40.5	<b>40.1</b>	44.5	<b>42.1</b>
13.	HUW 695	22	39.0	41.6	40.6	38.9	46.7	<b>41.4</b>	41.0	41.0	<b>41.0</b>	42.5	<b>41.4</b>
14.	HUW 696	04	32.6	39.0	39.9	38.0	42.8	<b>38.5</b>	36.4	38.9	<b>37.7</b>	47.6	<b>39.4</b>
15.	WBI 1 (HPYT 414)	01	39.4	40.9	46.4	39.7	45.0	<b>42.3</b>	39.7	44.0	<b>41.9</b>	44.9	<b>42.5</b>
16.	WBI 2 (HPYT 415)	06	42.9	41.5	42.9	37.8	44.4	<b>41.9</b>	42.4	41.3	<b>41.9</b>	45.2	<b>42.3</b>
17.	WBI 3 (HPYT 422)	05	38.8	39.9	43.2	40.8	47.4	<b>42.0</b>	39.0	40.5	<b>39.8</b>	47.2	<b>42.1</b>
18.	WBI 4 (HPYT 423)	03	37.4	45.5	41.9	38.7	43.0	<b>41.3</b>	38.1	42.3	<b>40.2</b>	44.4	<b>41.4</b>
19.	WBI 5 (HPYT 429)	15	34.4	39.3	39.4	38.6	45.7	<b>39.5</b>	34.9	40.5	<b>37.7</b>	46.8	<b>40.0</b>
20.	DPW 621-50 (C)	09	36.5	41.2	41.3	36.2	47.8	<b>40.6</b>	39.4	40.1	<b>39.8</b>	44.2	<b>40.8</b>
21.	K 0307 (C)	20	38.8	45.0	46.7	40.1	46.8	<b>43.5</b>	41.2	40.4	<b>40.8</b>	40.0	<b>42.4</b>
22.	MACS 6222 (C)	10	36.7	43.2	41.1	38.8	49.0	<b>41.8</b>	41.1	39.7	<b>40.4</b>	46.0	<b>41.9</b>
	<b>Mean</b>		<b>36.8</b>	<b>42.1</b>	<b>41.8</b>	<b>39.3</b>	<b>46.9</b>	<b>41.4</b>	<b>39.8</b>	<b>40.2</b>	<b>40.0</b>	<b>44.6</b>	<b>41.4</b>

**Table 39: Zinc Content (ppm) of *T.aestivum* in Special Trial (Wheat Bio-fortification Trial)**

Sr. No.	Variety	Code	NWPZ						NEPZ			PZ	Overall Mean
			Ludhiana	Durgapura	Delhi	Karnal	Hisar	Mean	Kanpur	Varanasi	Mean	Niphad	
1.	HD 3175	08	54.0	47.3	45.3	36.7	49.3	<b>46.5</b>	35.7	34.3	<b>35.0</b>	31.3	<b>41.7</b>
2.	HD 3176	02	54.6	41.3	47.7	37.9	50.7	<b>46.4</b>	39.5	29.2	<b>34.4</b>	35.1	<b>42.0</b>
3.	HD 3177	19	58.9	38.3	51.5	40.2	48.1	<b>47.4</b>	38.1	32.9	<b>35.5</b>	31.0	<b>42.4</b>
4.	HD 3178	21	59.8	42.3	41.3	38.8	47.7	<b>46.0</b>	37.2	36.7	<b>37.0</b>	31.3	<b>41.9</b>
5.	HD 3179	16	54.9	42.9	42.0	34.5	49.5	<b>44.8</b>	34.3	31.9	<b>33.1</b>	32.3	<b>40.3</b>
6.	HPBW 01	13	50.2	39.4	41.6	37.5	51.0	<b>43.9</b>	33.2	36.3	<b>34.8</b>	29.9	<b>39.9</b>
7.	HPBW 02	14	55.9	38.2	43.0	37.1	47.5	<b>44.3</b>	35.5	29.7	<b>32.6</b>	34.8	<b>40.2</b>
8.	HPBW 03	12	55.1	37.3	45.5	37.7	44.4	<b>44.0</b>	37.3	33.9	<b>35.6</b>	28.8	<b>40.0</b>
9.	HPBW 04	17	64.5	59.1	50.3	48.3	61.9	<b>56.8</b>	46.1	33.2	<b>39.7</b>	31.8	<b>49.4</b>
10.	HPBW 05	18	43.2	39.3	38.2	33.5	46.1	<b>40.1</b>	30.4	42.6	<b>36.5</b>	33.5	<b>38.3</b>
11.	HPBW 06	07	45.7	36.2	33.9	30.9	36.9	<b>36.7</b>	31.4	32.0	<b>31.7</b>	30.7	<b>34.7</b>
12.	HUW 694	11	51.5	40.1	42.2	36.5	47.4	<b>43.5</b>	34.1	33.3	<b>33.7</b>	30.0	<b>39.4</b>
13.	HUW 695	22	53.2	40.5	49.7	30.8	47.0	<b>44.2</b>	37.8	30.7	<b>34.3</b>	33.0	<b>40.3</b>
14.	HUW 696	04	44.5	34.5	44.2	37.4	44.2	<b>41.0</b>	38.1	35.5	<b>36.8</b>	31.0	<b>38.7</b>
15.	WBI 1 (HPYT 414)	01	55.6	41.8	47.1	34.2	47.8	<b>45.3</b>	36.1	36.7	<b>36.4</b>	35.9	<b>41.9</b>
16.	WBI 2 (HPYT 415)	06	65.1	41.5	42.6	35.1	51.3	<b>47.1</b>	36.2	33.4	<b>34.8</b>	32.6	<b>42.2</b>
17.	WBI 3 (HPYT 422)	05	55.4	37.0	42.6	39.0	46.9	<b>44.2</b>	35.2	32.1	<b>33.7</b>	34.5	<b>40.3</b>
18.	WBI 4 (HPYT 423)	03	52.2	40.3	39.4	34.4	46.6	<b>42.6</b>	32.3	32.5	<b>32.4</b>	31.1	<b>38.6</b>
19.	WBI 5 (HPYT 429)	15	48.1	36.0	44.3	38.4	45.8	<b>42.5</b>	35.8	29.9	<b>32.9</b>	33.8	<b>39.0</b>
20.	DPW 621-50 (C)	09	43.4	34.0	37.4	30.1	40.1	<b>37.0</b>	33.8	30.3	<b>32.1</b>	31.7	<b>35.1</b>
21.	K 0307 (C)	20	59.5	46.4	49.7	34.7	48.8	<b>47.8</b>	35.6	29.8	<b>32.7</b>	34.3	<b>42.4</b>
22.	MACS 6222 (C)	10	49.3	39.7	41.2	33.2	42.5	<b>41.2</b>	31.4	35.7	<b>33.6</b>	31.9	<b>38.1</b>
	<b>Mean</b>		<b>53.4</b>	<b>40.6</b>	<b>43.7</b>	<b>36.2</b>	<b>47.3</b>	<b>44.2</b>	<b>35.7</b>	<b>33.3</b>	<b>34.5</b>	<b>32.3</b>	<b>40.3</b>

# **SECTION D**

## **NURSERIES**

- i. Quality Component Screening Nursery (QCSN)**
- ii. National Wheat Nurseries**

**NGSN**

**EIGN - I**

**EIGN - II**

## Quality Component Screening Nursery

In QCSN, 52 genotypes were evaluated along with three checks at 12 locations across the country. It was well conducted and barring Kanpur and Dharwad, field expression was good at every location (Table 1). Since samples were not received from Pantnagar, pooled analysis was based upon 11 sites only. In the field, observations were recorded on plant height, days to heading, grain yield, 1000-grain weight and rust reactions. Grain analysis of all the samples was done by Indian Agricultural Research Institute, New Delhi and the parameters included grain protein content (at 14% grain moisture level), test weight (hectolitre weight), sedimentation value, grain appearance score, grain hardness index and yellow berry incidence in durum.

**Table 1: Overall field performance at test sites**

Location	Plot size (m <sup>2</sup> )	Sowing date	Grain yield (g/m <sup>2</sup> )	Height (cm)	Heading (days)	1000 grain weight (gm)
Almora	2.25	Nov.09	420	92	131	48.0
New Delhi	3.75	Nov.21	337	91	94	42.7
Karnal	3.00	Nov.12	554	102	96	44.9
Ludhiana	3.75	Nov.16	352	92	105	41.7
Durgapura	3.00	Nov.15	354	88	88	48.7
Kanpur	3.75	-	162	86	82	43.1
Pusa	3.125	Nov.20	317	87	73	42.2
Indore	2.00	Nov.15	476	94	69	45.4
Junagarh	2.00	Nov 30	433	71	59	46.6
Pune	3.75	Nov.15	296	89	71	47.3
Dharwad	3.00	Nov.17	179	74	65	40.5

**Location specificity:** Test weight was high (81kg/hl) at Durgapura, Indore and Junagarh centres and low (76kg/hl) at Ludhiana and Pusa (Table 2). Protein levels were high ( $\approx$ 13.5%) at Dharwad and Junagarh but dropped to 10% at Almora and Ludhiana. Site differences were not so conspicuous in sedimentation value but Pusa, Almora and Delhi (38-8ml) were quite distinct from Ludhiana, Indore and Pune (34ml). Karnal and Junagarh topped in grain hardness index (66-67) whereas Durgapura slipped to the bottom at 47. Grain appearance score was high (6.3) at Indore, Junagarh and low (5.6) at Pusa, Pune and Dharwad.

**Table 2: Overall quality characteristics at test sites**

Locations	Test wt. (kg/hl)	Protein (%)	Protein yield (g/m <sup>2</sup> )	Sedimentation value (ml)	Hardness Index	Grain look (score)
Almora	78.6	10.1	42.2	38	55	6.2
Delhi	79.2	13.3	44.8	38	64	5.8
Karnal	80.1	12.5	68.4	37	67	6.2
Ludhiana	75.7	10.3	36.3	34	58	5.9
Durgapura	81.0	13.1	46.5	35	47	6.0
Kanpur	80.1	10.9	17.6	37	59	5.9
Pusa	76.2	12.1	38.2	39	60	5.6
Indore	81.0	11.5	54.6	34	57	6.3
Junagarh	81.0	13.8	59.2	35	66	6.3
Pune	80.4	12.4	36.5	34	57	5.6
Dharwad	78.6	14.6	20.5	37	64	5.6

**Genetic superiority:** Statistical analysis revealed highly significant genotypic differences ( $P < 0.001$ ) in all traits. To identify promising genotypes, comparison was made against recently identified genetic resources and checks. Several new entries registered superiority in grain quality parameters (Table 3). Detailed information of all test entries is given Table 4.

**Test weight:** It varied between 75.5 to 81.5 kg/hl in QCSN entries. 17 genotypes had test weight in the range 80.0 to 81.5 kg/hl and 11 among them were durum. Top ranking genotypes were GW-09-246, GW 2012-450, GW 2012-454, GW 2012-444, GW 2012-452, GW 2012-464, NIDW 802, DBPQ 2 among durum (81kg/hl) and QLD 66, QLD 51, QLD 61, QLD 58 among bread wheats (81kg/hl). Test weight in best check PDW 233 (d) was 79.9kg/hl.

**Grain protein content:** Range in GPC was 11.1 to 14.0% but eleven entries had  $\geq 13\%$  grain protein including the check UP 2762 (13.3%). This elite lot included QLD 11, QLD 58, KLM 1008, QLD 54 and QLD 46 among bread wheat and KLM 1005, WSM 24, GW 2011-384, GW 2010-305 and GW 07-112 among durum. GPC in durum check PDW 233 was 11.4%.

**Protein yield:** Genotypes registered large differences in protein yield (32–52g/m<sup>2</sup>) with the best check HI 977 at 44g/m<sup>2</sup>. 17 entries had protein yield in 45-52g/m<sup>2</sup> range out of which only two were durum (GW 2011-389, GW 2012-.454). Bread wheat genotypes with protein yield 47 to 52g/m<sup>2</sup> were QLD 65, QBP 12-10, QBP 12-11, GW 2011-389, QLD 68, QLD 66, QLD 51, QLD 67 and QBP 12-9.

**Table 3: Promising genotypes for individual quality trait**

Component	Range	Genotypes
Protein content (%)	13.3-14.0	QLD 11, KLM 1005 (d), WSM 24 (d), QLD 58, GW 2011-384 (d), KLM 1008, GW 2010-305 (d), QLD 54 and UP 2762 (C)
Protein yield (g/m <sup>2</sup> )	47-52	QLD 65, QBP 12-10, QBP 12-11, GW 2011-389 (d), QLD 68, QLD 66, QLD 67, GW 2012-454 (d)
Sedimentation value(ml)	51-54	QLD 31, BW 5872, QBP 13-8 and HI 977 (C)
High grain hardness index	80-81	GW-2012 457(d), PDW 233 (d), GW 2012-463 (d), DBPQ 02 (d), GW 2012-450 (d), GW 2012- 454 (d)
Low grain hardness index	05-15	QLD 49, QLD 67, QBP 12-11, QBP 12-8, QLD 54
Test weight (kg/ml)	80-81	GW-09-246 (d), GW 2012-450 (d), GW 2012-454 (d), GW 2012-444 (d), QLD 66, GW 2012-452 (d), NIDW 802 (d), GW 2012-464 (d), DBPQ 2 (d), QLD 51 and QLD 61
1000 grain weight (g)	50-56	WSM 24 (d), GW 20123-442 (d), GW 07-112 (d), KLM 1005 (d), KLM 1008, WSM 171(A), QBP 12-8
Grain appearance score out of 10	6.4-6.6	QLD 46, GW 2012-442 (d), QLD 61, GW-2012-444 (d), KLM 1005 (d) and GW 2012-450 (d)
Grain diameter (mm)	3.20-3.31	GW 2012-442 (d), WSM 24 (d), GW-07-112 (d), KLM 1005 (d) and KLM 1008

**Grain hardness index:** The nursery helped to identify genotypes of hard and soft grain textures. Six entries including check PDW233 registered high grain index (80-81) and all of them were durum. Ten new entries exhibited soft grain texture with hardness index below 20. Genotypes with very soft grain texture (grain hardness index: 5-15) were QLD 49, QLD 67, QBP 12-11, QBP 12-8 and QLD 54.

**Sedimentation value:** Range in sedimentation value was large (15 to 54ml) but only few entries good gluten strength. In comparison to best check HI 977 (51ml), three entries i.e. QLD 31, BW 5872 and QBP 13-8 could be rated at par (51-54ml).

**Kernel weight:** 1000 grain weight among genotypes varied from 36 to 56g. 13 entries had TGW  $\geq$ 48g and 8 of them were durum. Best entries in grain size were WSM 24, GW 20123-442, GW 07-112, KLM 1005 among durum (TGW: 52-56g) and KLM 1008, WSM 171 (A), QBP 12-8 among bread wheats (50-52g). Amongst checks, highest TGW was recorded in UP 2762 (47.3g).



**Grain appearance score:** It ranged from 5.0 to 6.6 but majority of the lines had GAS  $\geq 6.0$ . The elite group with GAS  $\geq 6.4$  involved four durum i.e. GW 2012-442, GW-2012-444, KLM 1005, GW 2012-450 and two bread wheats i.e. QLD 46 and QLD 61. GAS in durum and bread wheat checks was 6.1 and 5.8, respectively.

**Grain yield:** Many genotypes expressed good yield levels in QCSN. In comparison to best check HI 977 (381g/m<sup>2</sup>), nine entries had yield in the range 400-431g/m<sup>2</sup>. High yielders in bread wheat were QLD 65, QBP 12-10, QBP 12-11, QBP 12-09, QLD 51 and QLD 64 and no durum belonged to this elite group.

**Grain diameter:** Nursery had grains of different diameters (2.78-3.331mm) which remained  $\geq 3.20$ mm in nine genotypes. Besides five durum i.e. GW 2012-442, WSM 24, GW-07-112, GW 2012-444, KLM 1005; this lot also included four bread wheat genotypes i.e. KLM 1008, UP 2672 (c), WSM 171 (A) and QLD 46.

**Disease incidence:** Rust reactions were reported from eight centres. Virulence in yellow rust was recorded at Almora, Pantnagar, Ludhaina and Karnal and the entries found susceptible (highest score  $\geq 40S$ ) were GW 2011-305 (d), GW 2011-384 (d), GW 2011-393 (d), WSM 171 QLD 49, QLD 62, UP 2672 (c), HI 977 (c), K 1005, K 1008 and WSM 24 (d). Data on brown rust incidence was received from Pantnagar, Karnal, Pusa, Indore and Pune. Three entries namely GW 2010-305 (d), QLD 51 and QLD 69 expressed were found susceptible with highest reactions  $\geq 30S$ . Black rust was reported from Indore only and three entries i.e. BW 5872, QLD 31 and GW 2010-305 (d).

**Yellow berry incidence:** Occurrence was high (21%) at Almora, Ludhiana and moderate at Durgapura, Pune and Kanpur (Mean: 8.4 to 14.0%). Yellow berry free locations were Junagarh, Delhi and Dharwad. Entries with  $\geq 10\%$  incidence were GW 2012-450 (18.1%), GW 2012-461 (14.2%), GW 2012-452 (12.51%), GW 2012-454 (10.1%) and GW 2012-463 (10.0%). Entries with yellow berry incidence  $< 5\%$  were GW 07-122, KLM 1005, GW 2012-442, GW 09-246, GW 2011-393 and GW 2012-464.

**Utilization:** The material tested in QCSN was utilized at seven centres namely Almora, Pantnagar, Ludhiana, Karnal, Indore, Junagarh and Pune. 33 entries of this nursery were either retained as genetic resource or recycled in the breeding programme by one or more centres. Most preferred genotypes in the nursery were QLD 61, 63 & 65. BW 5872, QBP 13-9 and GW 2011-389.

**Table 4: Overall performance of the test entries**

Sr. No.	Entries	GPC (%)	Prot yld (g/m <sup>2</sup> )	TGW (g)	Test Wt. (kg/hl)	Sedim V. (ml)	Hard. index	GAS (score)	Yield (g/m <sup>2</sup> )	Height (cm)	Head. (days)
<b>Bread wheat</b>											
1	GW-2011-389	11.7	40.6	41.9	78.1	49	60	5.9	421	96	83
2	GW-2012-468	11.6	41.6	40.1	79.2	43	64	5.6	326	101	79
3	QBP 12-10	12.1	50.0	38.6	78.7	33	18	5.4	421	93	86
4	QBP 12-11	12.4	49.0	44.4	77.5	42	11	5.4	411	91	82
5	QBP 12-8	11.5	45.9	49.8	79.2	43	15	5.9	414	104	85
6	QBP 12-9	11.7	46.5	39.5	79.0	33	19	5.6	407	89	88
7	QBP-13-10	11.7	43.8	39.7	79.1	32	20	5.7	381	93	86
8	QBP-13-11	11.6	45.4	42.9	77.8	33	16	5.7	403	95	86
9	QBP-13-8	11.2	41.8	46.9	77.6	51	47	6.1	381	96	84
10	QBP-13-9	12.0	42.9	40.1	78.4	33	19	5.8	368	92	86
11	QLD 46	13.1	40.3	48.2	79.9	44	47	6.6	312	117	87
12	QLD 49	12.2	37.9	39.4	78.8	45	5	5.9	314	89	81
13	QLD 51	11.6	46.8	43.4	80.7	39	56	6.1	402	90	85
14	QLD 52	12.0	40.4	43.1	80.3	48	47	6.1	329	83	78
15	QLD 54	13.3	41.4	42.7	77.3	33	15	5.7	336	84	78
16	QLD 58	13.3	45.9	40.7	80.5	42	70	5.8	353	78	82
17	QLD 60	12.1	34.5	39.3	75.7	33	66	5.0	306	98	93
18	QLD 61	12.1	44.2	44.3	80.5	46	62	6.5	365	89	88
19	QLD 62	11.4	42.1	39.0	79.3	39	62	5.9	367	89	79
20	QLD 63	11.8	43.8	42.4	79.7	37	62	6.3	381	90	87
21	QLD 64	11.1	44.0	36.5	79.7	46	76	5.6	395	91	87
22	QLD 65	12.1	51.8	38.8	80.4	43	74	5.7	430	89	87
23	QLD 66	12.8	47.9	40.3	80.9	43	69	5.9	378	81	82
24	QLD 67	12.2	46.7	48.1	78.4	38	11	6.0	383	88	80
25	QLD 68	12.5	48.7	41.7	79.8	45	51	6.0	387	84	79
26	QLD 69	11.3	43.5	46.5	79.1	40	63	6.2	376	86	80
27	WSM 171 (A)	12.1	32.4	50.3	75.8	46	72	5.6	257	107	87
28	BW 5872 (I)	12.0	43.5	38.0	77.3	54	73	5.4	371	90	86
29	KLM 1008 (I)	13.3	41.7	51.9	78.7	36	54	6.0	313	92	83
30	QLD 11 (I)	14.0	45.6	40.7	79.9	34	66	5.6	346	92	90
31	QLD 28 (I)	11.9	46.5	45.2	77.8	35	21	5.8	410	91	89
32	QLD 31 (I)	11.9	46.3	41.2	79.2	54	60	5.9	380	97	83
33	HI 977 (C)	11.7	44.3	42.6	79.2	51	65	5.8	381	91	84
34	UP 2762 (C)	13.3	39.9	47.3	79.6	43	61	5.8	303	87	84

**Cont.....**

Sr. No.	Entries	GPC (%)	Prot (g/m <sup>2</sup> )	Yld (g)	TGW (kg/hl)	Test Wt. V. (ml)	Sedim Hard. index	GAS (score)	Yield (g/m <sup>2</sup> )	Height (cm)	Lead. (days)
<b>Durum wheat</b>											
35	DBPQ-02	12.3	39.2	44.2	80.5	31	80	5.9	323	83	89
36	GW-09-246	12.2	43.9	43.5	81.5	31	76	6.1	357	87	86
37	GW-2010-305	13.3	41.6	48.9	75.5	33	78	5.7	254	82	87
38	GW-2011-384	13.4	41.7	47.9	77.7	28	74	6.0	295	85	83
39	GW-2011-393	12.6	46.6	46.1	80.4	34	77	6.3	329	87	83
40	GW-2012-442	12.7	39.9	55.5	79.7	24	71	6.6	320	86	84
41	GW-2012-443	11.9	45.1	47.3	80.0	25	74	6.3	383	82	88
42	GW-2012-444	11.7	40.4	48.1	81.0	20	79	6.4	372	82	85
43	GW-2012-450	11.6	34.6	43.7	81.4	20	80	6.4	371	80	86
44	GW-2012-452	11.4	40.1	47.3	80.8	29	74	6.1	356	79	82
45	GW-2012-454	12.6	37.9	45.2	81.0	25	80	6.1	371	76	87
46	GW-2012-456	12.4	36.8	47.4	79.7	15	78	6.2	320	77	82
47	GW-2012-457	12.4	43.5	44.1	79.7	27	81	5.8	364	73	82
48	GW-2012-461	11.8	34.0	46.6	79.7	30	77	6.0	353	77	83
49	GW 2012-463	12.0	38.2	45.1	79.7	27	80	5.4	296	73	86
50	GW-2012-464	12.3	48.9	47.0	80.7	27	79	6.2	333	78	87
51	NIDW 802	12.1	41.6	48.5	80.7	25	76	6.1	348	91	86
52	WSM 24 (I)	13.6	37.4	55.9	77.3	24	67	6.0	281	74	84
53	GW-07-112 (I)	13.2	40.5	52.5	80.2	28	78	6.3	285	82	87
54	KLM 1005 (I)	13.7	39.9	54.2	78.4	28	76	6.4	291	88	87
55	PDW 233 (C)	11.4	36.5	42.4	79.9	31	81	6.1	327	85	89
	CD (5%)	0.6	6.6	2.8	1.5	3	5	0.3	54	5	3

**New genetic stocks:** Three genotypes completed three years testing in QCSN and their average performance was compared with the checks and recently identified genetic resources (Table 5). QLD 46 had all characteristics of rainfed variety C 306 as it was tall and illustrated delayed flowering, had good grain appearance (GAS: 6.5), sedimentation value (44ml), grain protein (13.2%) and bold grains (TGW: 46.4g). It shall be examined for chapati quality for any further decision. Durum entry GW 09-246 excelled in test weight (81.7 kg/hl) but remained at par with check PDW 233 and recently identified genetic resources like K 1005 and GW 07-112 for all other parameters. QLD 49, a bread wheat genotype developed by DWR had very soft grain texture with grain hardness index only 13. Rest of the grain quality parameters i.e. protein (12.3%), test weight (78.2 kg/hl), sedimentation value (44ml), GAS (5.5) and yield (351 g/m<sup>2</sup>) were comparable with HI 977 and other soft grain genotype QLD 28. Therefore, QLD 49 derived from cross 37<sup>th</sup> IBWSN 72 / 5th IAT was identified as genetic resource for grain softness.

**Table 5: Grain quality trait of final year entries (period: 2012-14)**

Genotype	Protein (%)	TGW (g)	Prot. yld (g/m <sup>2</sup> )	Test wt. (kg/hl)	SV (ml)	GHI	GAS (score)	Yield (g/m <sup>2</sup> )	HT (cm)	HD (days)
<b>Bread wheat</b>										
QLD 46	13.2	46.4	42.2	79.8	44	53	6.5	321	115	91
QLD 49	12.3	36.6	43.0	78.2	49	13	5.5	351	90	81
HI 977 ©	12.1	40.1	44.6	77.8	52	71	5.5	373	91	84
UP2672 ©	13.5	46.7	41.2	79.2	46	68	5.8	320	87	84
QLD 11 (I)	13.8	39.5	36.7	79.3	37	67	5.6	339	92	90
QLD 28 (I)	12.1	43.2	51.9	77.4	37	26	5.8	437	90	89
QLD 31 (I)	12.3	37.6	48.8	78.1	51	75	5.4	399	98	83
K 1008 (I)	13.4	51.2	44.2	79.0	37	60	6.3	333	91	84
BW 5872 (I)	12.3	37.6	46.3	76.9	51	75	5.4	384	91	86
<b>Durum wheat</b>										
GW 09-246	12.3	42.8	45.6	81.7	33	85	6.0	360	87	87
K 1005 (I)	13.8	51.7	40.5	77.9	31	79	6.4	296	88	88
GW 07-112 (I)	13.4	50.4	42.8	79.7	31	83	6.2	312	83	86
PDW 233 ©	11.9	41.6	41.9	79.6	35	86	5.9	360	85	90

**Preliminary evaluation:** 63 new entries were raised at Karnal to find new entrants for QCSN. Grain analysis done at IARI revealed that couple of them were good in various grain quality components list of which is given below:

Parameter	Range	Genotypes
Protein content	13.5-13.9	GW 2013-499, BWL 1660, BWL 1663
Grain hardness	89	GW 2013-500, GW 2013-503
Sedimentation value	58-61	PHS 717, GW 2103-502, PHS 70-5, PHS 708
Test weight	84-86	BWL 1662, GW 213-513, BWL 1664
1000 grain weight	55-60g	NGSN-3/ PBW 233, GW 2013-498, GW 2013-502, GW 2013-503
Grain appearance	6.8	GW 2013-408, GW 2013-502, BWL 1660

## Evaluation of Processing and Nutritional Quality of National Wheat Nurseries

During the year (2013-14), 103, 92 and 70 lines including checks belonging to NGSN, EIGN-I and EIGN-II were grown at DWR Research Farm, Karnal. All the lines of these three nurseries were analysed for processing quality parameters viz. test weight, protein content, grain hardness index, moisture content & sedimentation value and also for nutritional quality parameters like iron & zinc. Different processing and nutritional quality parameters showed wide variability (Table 6).

**Table 6: Variability in Processing and Nutritional Quality Parameters**

Parameter	NGSN	EIGN-I	EIGN-II
Test Weight (Kg/hl)	78.2 (69.0-83.0)	79.0 (74.3-82.4)	80.0 (74.0-83.2)
Protein Content (%)	13.2 (11.6-14.6)	13.2 (11.1-14.9)	13.0 (10.7-14.7)
Sedimentation Value(ml)	44 (21-63)	51 (36-61)	36 (23-41)
Grain Hardness Index	76 (28-102)	66 (26-86)	88 (67-101)
Iron (ppm)	41.2 (30.2-53.5)	43.2 (35.8-53.1)	40.4 (33.4-47.8)
Zinc (ppm)	34.5 (26.1-46.9)	33.8 (28.0-42.5)	34.8 (26.0-44.0)

Attempts were made to identify promising genotypes for various processing and nutritional quality parameters from all the 3 nurseries viz. NGSN (Table 7), EIGN-I (Table 8) and EIGN-II (Table 9).

**Table 7: Promising Genotypes for Processing and Nutritional Quality Parameters (NGSN)**

Parameters	Value	Genotypes
Test Weight (kg/hl)	>82.0	MACS 3828, AKAW 4210-6, HI 8713 (D) HI 1569, HI 8498 (D) (C), Raj 4390, HS 533, MACS 3744
Protein Content (%)	>14.0	RSP 561, PHS 1101, PHS 1102, PHS 1103, PHS 1108, PHS 1109, NWL 09-11, J 07-40, HPW 355, NWL 09-07, VW 321, GW 09-201, Local Check (C), LOK 54
Sedimentation Value (ml)	>55	DBW 58, NWL 09-11, LBPY 2010-11, LOK 65, LOK BOLD, WSM 41, LBPY 2010-24, NWL 09-8, Raj 4387, WH 1080, MP 3288
Grain Hardness Index	>90	HI 8703 (D), TL 2969 (T), MACS 3742 (D), MP 3304, DDK 1041 (dic), HI 8715 (D), HI 8498 (D) (C), NWL 09-07, NIAW 577, DBPY 08-4, HI 8713 (D)
	<45.0	HPW 355
Iron (ppm)	>45.0	Sonalika (C), RAJ 4238, Local Check, DDK 1041 , (dic), DBW 17 (C), KB 2013-06, PHS 1101, PHS 1103, PHS 1107, PHS 1108, DL 1063, GW 09-201, LOK 54, WSM 41, Raj 4390, PBW 640, DBW 71
Zinc (ppm)	>40.0	UP 2798, DDK 1041 (dic), PHS 1107, HI 8498 (D) (C), DL 1063, LOK BOLD

**Table 8: Promising Genotypes for Processing and Nutritional Quality Parameters (EIGN-I)**

Parameters	Value	Genotypes
Test Weight (kg/hl)	>81.0	33 <sup>rd</sup> ESWYT 122, 130, DBW 17 (C), 14 <sup>th</sup> FHBSN 6403, 22 <sup>nd</sup> ISEPTON 6218, 6233, 6234, 20 <sup>th</sup> SAWYT 315, 339, 30 <sup>th</sup> SAWSN 3013, DBW 17 (C)
Protein Content (%)	>14.0	33 <sup>rd</sup> ESWYT 150, 45 <sup>th</sup> IBWSN 1045, 1134, 1195, 1287, 23 <sup>rd</sup> HRWSN 2007
Sedimentation value (ml)	>55	33 <sup>rd</sup> ESWYT 103, 109, 119, 122, 136, 141, 145, 150, 20 <sup>th</sup> HRWYT 235, 45 <sup>th</sup> IBWSN 1018, 1021, 1225, 1282, 1301, 7 <sup>th</sup> STEMRRSN 6067, 23 <sup>rd</sup> HRWSN 2108, 2118, 20 <sup>th</sup> SAWYT 306, 308, 338, 340, 30 <sup>th</sup> SAWSN 3011, 3012, 3047, 3065, 3085, DBW 621-50, 7 <sup>th</sup> EBWYT 527
Grain Hardness Index	>85	20 <sup>th</sup> HRWYT 235, 22 <sup>nd</sup> ISEPTON 6218
	<45	45 <sup>th</sup> IBWSN 1122, 23 <sup>rd</sup> HRWSN 2002, 22 <sup>nd</sup> ISEPTON 6219, 20 <sup>th</sup> SAWYT 315, 337, 30 <sup>th</sup> SAWSN 3005, 3029
Iron (ppm)	>45.0	33 <sup>rd</sup> ESWYT 145, 150, 20 <sup>th</sup> HRWYT 214, 236, 45 <sup>th</sup> IBWSN 1045, 1134, 1294, 1301, 1314, GW 322 (C), 7 <sup>th</sup> STEMRRSN 6007, 6111, 14 <sup>th</sup> FHBSN 6403, 23 <sup>rd</sup> HRWSN 2118, DBW 17 (C), 20 <sup>th</sup> SAWYT 337, 338, 339, 343, 30 <sup>th</sup> SAWSN 3008, 3029, 3048, 3055, GW 322 (C)
Zinc (ppm)	>40.0	45 <sup>th</sup> IBWSN 1134, 7 <sup>th</sup> STEMRRSN 6144

**Table 9: Promising Genotypes for Processing and Nutritional Quality Parameters (EIGN-II)**

Parameters	Value	Genotypes
Test Weight (kg/hl)	>82.0	IDYN-17, 20, 25, 36, 21, 33, IDSN-36, 43, 49, 81
Protein Content (%)	>14.0	57, 117, 43, HI 8498 (C)
Sedimentation value (ml)	>40	IDYN-21, IDSN-43, 59, 121
Grain Hardness Index	>95	IDYN-13, 4, 20, 32, 36, 38, 41, 49, 50, IDSN-49, 97, PDW 291 (C)
Iron (ppm)	>45.0	IDYN-30, 33, 36, 43, HI 8498 (C), PDW 291 (C), IDSN-117, PDW 291 (C), HI 8498 (C)
Zinc (ppm)	>40.0	IDYN-30, IDSN-22, 78, 117, 143, PDW 291 (C), HI 8498 (C)

Detailed results have been present in Table 10 (NGSN), Table 11 (EIGN-I) and Table 12 (EIGN-II).

**Table 10: Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nursery (NGSN)**

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kg/hl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
1	UP 2763	80.0	12.7	10.2	45	81	42.5	31.7
2	HI 8703 (D)	82.0	12.1	10.2	40	93	42.4	32.1
3	UAS 320	77.0	12.2	10.1	45	77	37.8	34.0
4	PBW 658	81.0	12.5	10.1	53	64	41.2	33.8
5	TL 2968 (T)	75.0	13.9	10.7	26	85	37.7	34.7
6	DBW 58	78.3	12.9	10.4	56	81	37.0	27.8
7	HS 534	76.3	12.1	10.0	36	78	40.6	34.2
8	TL 2969 (T)	74.2	12.8	10.4	30	100	30.2	33.4
9	HI 8722 (D)	78.0	12.9	10.3	25	81	42.3	36.8
10	HPW 360	-	-	-	-	-	-	-
10A	Sonalika (C)	81.2	13.2	11.0	45	89	46.2	38.4
11	HUW 640	78.2	13.2	10.0	53	79	44.8	31.8
12	VL 941	75.6	13.0	9.8	44	82	39.6	27.3
13	HS 545	79.5	13.5	10.0	43	74	41.1	33.8
14	PBW 648	80.2	12.8	10.4	43	71	41.9	32.9
15	RSP 561	79.2	14.4	10.4	45	87	38.6	32.1
16	MACS 3742 (D)	81.0	12.1	10.6	44	95	33.7	34.3
17	MACS 3828	82.4	13.0	10.8	37	76	39.4	33.6
<b>B.</b>	<b>Resistant to stem &amp; Leaf rust</b>							
18	MP 3288	78.7	13.0	10.5	47	67	39.8	29.3
19	HD 3066	76.0	13.3	10.7	53	70	42.8	36.5
20	LOK 62	72.3	13.2	10.6	38	55	39.8	35.7
20A	DBW 17 (C)	81.0	13.0	10.0	40	73	43.3	35.4
21	JWS 134	75.7	12.6	10.0	50	85	39.6	31.9
22	MP 3304	75.6	13.7	10.2	45	93	39.9	26.1
23	HI 1572	76.3	12.4	10.6	53	79	40.9	33.5
24	WH 1095	81.3	12.3	10.2	35	79	38.2	35.4
25	NW 5013	80.0	12.6	10.9	34	71	38.2	35.4

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kg/hl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
26	RAJ 4238	74.0	12.2	11.5	48	78	48.1	33.8
27	UP 2798	76.0	13.1	10.1	42	69	42.7	41.4
28	AKAW 4210-6	83.0	13.3	10.6	51	81	42.5	33.2
29	HD 3040	78.4	12.5	10.1	54	76	38.9	38.6
30	MACS 2997 (dic)	75.1	12.6	10.3	24	80	40.2	35.3
30A	HI 8498 (D) (C)	81.0	12.2	10.7	33	89	40.5	36.4
30B	Infector row	76.6	11.9	9.7	48	76	37.3	32.3
30C	Local Check	78.7	12.2	10.5	55	68	46.2	33.1
31	MACS 5012 (dic)	74.2	12.7	10.3	28	81	42.1	36.5
32	DDK 1041 (dic)	73.0	13.1	10.4	25	97	46.6	41.6
33	KRL 304	77.0	13.7	10.4	51	75	39.9	28.6
34	HD 3058	79.5	12.9	9.9	47	70	37.0	34.7
35	UP 2797	78.2	12.7	10.4	54	76	41.1	36.5
<b>C.</b>	<b>Resistant of Leaf &amp; Stripe rusts</b>							
36	HI 8713 (D)	82.4	11.6	10.8	35	83	35.4	35.3
37	WHD 948 (D)	82.0	13.0	10.6	37	89	42.5	35.5
38	HI 8715 (D)	80.0	13.3	10.6	21	91	34.6	31.8
39	WHD 946 (D)	82.0	13.1	10.8	38	88	38.4	32.1
<b>D.</b>	<b>Resistant of Karnal Bunt (contributors: Dr. Indu Sharma &amp; Satish Kumar)</b>							
40	KB 2013-03	73.6	13.5	10.3	35	66	37.4	32.5
40A	DBW 17 (C)	80.0	14.0	9.9	38	74	46.2	39.5
41	KB 2013-06	78.2	12.8	10.4	35	77	50.2	38.2
42	PHS 1101	76.7	14.3	11.0	42	70	53.5	33.4
43	PHS 1102	77.0	14.1	10.3	47	77	44.0	36.4
44	PHS 1103	77.0	14.5	10.5	42	65	48.8	36.4
45	PHS 1104	79.7	13.7	10.7	40	75	41.9	33.4
46	PHS 1105	77.0	13.5	11.0	48	64	42.6	33.4
47	PHS 1106	76.0	13.5	10.9	52	77	41.5	36.8
48	PHS 1107	74.0	13.1	10.4	40	70	46.5	40.3
49	PHS 1108	77.0	14.4	10.4	46	56	47.8	36.7
50	PHS 1109	77.0	14.3	10.3	43	72	40.2	31.4
50A	HI 8498 (D) (C)	81.3	13.8	10.8	40	102	42.1	42.5



Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kg/hl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
51	NWL 09-11	78.2	14.2	10.2	57	76	37.9	34.5
52	VW 916	74.0	12.9	10.2	44	90	35.3	31.0
53	VW 931	77.8	12.9	10.3	41	65	37.0	30.9
54	J 07-40	77.2	14.1	10.0	55	77	39.3	32.7
55	HPW 355	73.0	14.6	9.8	41	28	35.4	30.7
56	NWL 09-07	69.0	14.4	10.4	32	95	42.4	34.6
57	VW 321	73.2	14.2	10.9	54	83	41.0	32.5
58	DL 1012	73.0	14.0	10.8	41	58	42.3	39.3
59	DL 1063	75.7	13.7	10.5	35	63	45.2	46.9
60	GW 09-201	78.2	14.5	10.7	44	77	51.2	38.4
60A	Sonalika (C)	81.4	13.3	10.3	45	75	39.6	32.0
60B	Infector row (C)	78.7	12.7	10.1	52	81	44.6	34.8
60C	HD 3086	80.0	14.3	10.7	52	73	44.8	30.0
61	LBPY 2010-11	81.0	13.6	10.2	59	56	42.2	30.3
62	LBPY 2010-25	80.0	13.8	10.4	38	71	42.4	35.7
63	LOK 54	72.3	14.5	10.3	46	58	47.2	35.8
64	LOK 65	71.0	13.8	10.5	63	63	39.4	35.5
65	LOK BOLD	77.2	13.4	10.4	61	60	42.6	43.5
66	WSM 41	77.8	14.0	10.3	56	77	47.3	37.8
67	HI 1569	83.0	12.9	10.6	32	76	39.0	32.9
68	LBPY 2010-24	81.6	12.7	10.8	62	71	41.2	33.9
69	NWL 09-8	77.7	12.8	10.2	59	67	37.4	31.0
<b>A.</b>	<b>Contributor: Dr. S.N. Sharma, Durgapura</b>							
70	Raj 4387	76.0	12.7	10.6	58	71	38.6	27.6
70A	HI 8498 (D) (C)	82.6	12.8	10.6	37	90	39.6	32.5
71	Raj 4388	78.7	12.4	10.7	41	55	44.9	32.0
72	Raj 4389	77.5	13.6	10.0	52	69	43.1	35.4
73	Raj 4390	82.2	12.9	10.3	36	70	45.7	34.8
74	Raj 4391	80.0	13.4	10.0	41	61	39.4	30.6

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
<b>B.</b>	<b>Contributor: Dr.S.K. Sinjgh</b>							
75	PBW 640	80.2	13.6	10.1	52	83	46.5	38.0
76	RSP 566	81.3	12.9	10.6	44	65	38.2	32.2
77	HS 533	82.5	13.8	10.8	38	73	39.6	32.1
78	MACS 3744	82.7	12.3	10.6	45	80	33.6	32.0
79	NIAW 577	81.2	12.2	10.8	43	97	35.7	34.7
80	DBPY 08-4	79.5	13.2	10.6	50	92	34.8	34.1
80A	Sonalika (C)	81.0	13.9	10.2	40	75	43.3	35.5
81	DBW 71	82.0	13.2	9.8	51	61	47.1	35.1
82	DBW 93	81.0	13.3	10.0	38	64	43.5	36.0
<b>III.</b>	<b>Quality Component Lines (Contributor: Dr. R.K. Gupta)</b>							
83	HD 2864	77.6	13.3	10.0	40	73	40.6	35.0
84	Raj 4238	77.5	13.4	10.5	50	68	36.6	31.0
85	MP 3336	81.0	13.5	10.4	52	62	43.8	37.3
86	NIAW 34	79.0	13.9	10.1	43	67	41.5	38.0
87	HI 8713 (D)	76.0	13.3	9.9	32	92	34.8	37.8
88	WH 1080	78.7	13.3	10.4	57	80	40.0	36.7
89	MP 3288	79.0	12.8	10.0	56	81	43.7	37.6
90	A-9-30-1 (D)	78.8	12.6	9.8	48	82	38.6	33.4
90A	DBW 17 (C)	79.6	13.0	9.6	43	82	40.3	34.3
90B	Infector row (C)	77.0	12.5	10.2	50	79	35.7	33.4
90C	HD 3086	-	-	-	-	-	-	-
<b>Overall Mean</b>		<b>78.2</b>	<b>13.2</b>	<b>10.4</b>	<b>44</b>	<b>76</b>	<b>41.2</b>	<b>34.5</b>
<b>Overall Minimum</b>		<b>69.0</b>	<b>11.6</b>	<b>9.6</b>	<b>21</b>	<b>28</b>	<b>30.2</b>	<b>26.1</b>
<b>Overall Maximum</b>		<b>83.0</b>	<b>14.6</b>	<b>11.5</b>	<b>63</b>	<b>102</b>	<b>53.5</b>	<b>46.9</b>

**Table 11 : Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nursery (EIGN-I)**

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
1	33 <sup>rd</sup> ESWYT 103	78.0	13.0	10.8	59	70	35.9	28.5
2	33 <sup>rd</sup> ESWYT 105	80.2	13.4	10.5	53	68	38.9	35.5
3	33 <sup>rd</sup> ESWYT 109	79.5	14.0	10.9	60	76	41.4	29.2
4	33 <sup>rd</sup> ESWYT 119	80.0	12.6	10.2	58	62	43.2	35.4
5	33 <sup>rd</sup> ESWYT 122	81.5	12.4	10.7	56	59	40.8	33.5
6	33 <sup>rd</sup> ESWYT 124	78.6	11.6	10.7	53	63	39.7	32.1
7	33 <sup>rd</sup> ESWYT 130	82.3	11.8	10.6	54	68	37.7	32.0
8	33 <sup>rd</sup> ESWYT 136	79.0	12.8	11.7	60	73	39.4	28.0
9	33 <sup>rd</sup> ESWYT 141	76.4	13.4	10.1	61	74	43.1	32.2
10	33 <sup>rd</sup> ESWYT 145	78.0	13.9	10.4	60	62	47.0	32.4
11	33 <sup>rd</sup> ESWYT 150	77.5	14.8	10.3	59	65	48.4	36.8
12	20 <sup>th</sup> HRWYT 213	79.0	13.0	10.7	46	73	44.0	34.6
13	20 <sup>th</sup> HRWYT 214	76.0	13.8	9.7	41	82	49.6	35.4
14	20 <sup>th</sup> HRWYT 219	78.2	14.0	10.2	47	46	42.2	33.2
15	20 <sup>th</sup> HRWYT 228	77.6	13.1	10.0	41	81	40.4	36.0
16	20 <sup>th</sup> HRWYT 235	76.0	12.9	9.7	59	86	41.3	31.9
17	20 <sup>th</sup> HRWYT 236	77.7	13.4	10.1	54	66	48.1	31.2
18	45 <sup>th</sup> IBWSN 1018	79.2	13.4	9.8	57	69	44.8	32.3
19	45 <sup>th</sup> IBWSN 1021	76.3	13.5	10.1	60	71	40.1	34.0
20	45 <sup>th</sup> IBWSN 1045	80.0	14.2	9.3	55	55	49.3	39.3
21	45 <sup>th</sup> IBWSN 1121	78.7	13.9	10.6	43	76	42.5	38.3
22	45 <sup>th</sup> IBWSN 1122	76.7	14.0	9.6	47	26	44.0	33.6
23	45 <sup>th</sup> IBWSN 1134	80.0	14.9	9.6	48	63	47.5	42.5
24	45 <sup>th</sup> IBWSN 1195	79.0	14.4	10.6	53	66	42.8	35.9
25	45 <sup>th</sup> IBWSN 1225	74.3	13.2	11.2	58	74	44.3	36.4

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
26	45 <sup>th</sup> IBWSN 1243	77.5	13.2	10.7	55	64	41.3	32.0
27	45 <sup>th</sup> IBWSN 1282	78.2	13.2	9.9	56	68	40.3	32.6
28	45 <sup>th</sup> IBWSN 1287	79.0	14.2	10.0	37	50	43.8	38.0
29	45 <sup>th</sup> IBWSN 1288	80.1	14.0	10.0	43	53	43.9	38.5
30	45 <sup>th</sup> IBWSN 1294	80.0	13.9	10.3	41	56	51.4	35.1
30A.	DBW 17 (C)	81.3	13.2	10.9	36	73	44.3	31.9
30B.	DBW 39 (C)	77.3	12.4	9.6	41	61	41.9	35.7
30C.	GW 322 (C)	77.7	13.2	10.7	43	76	47.4	38.2
31	45 <sup>th</sup> IBWSN 1301	80.7	13.9	10.8	58	53	47.9	35.9
32	45 <sup>th</sup> IBWSN 1314	78.4	13.5	10.6	53	59	47.9	36.1
33	7 <sup>th</sup> STEMRRSN 6007	76.8	13.5	10.9	45	61	50.5	36.6
34	7 <sup>th</sup> STEMRRSN 6036	80.3	13.5	10.6	40	62	44.0	34.4
35	7 <sup>th</sup> STEMRRSN 6067	81.0	12.8	10.9	60	57	42.2	30.0
36	7 <sup>th</sup> STEMRRSN 6111	77.3	13.6	10.5	44	62	45.3	38.7
37	7 <sup>th</sup> STEMRRSN 6144	80.2	13.5	9.9	47	67	44.7	40.4
38	14 <sup>th</sup> FHBSN 6403	81.2	13.4	10.7	44	73	45.8	32.0
39	14 <sup>th</sup> FHBSN 6416	79.6	12.5	11.1	45	79	37.1	28.5
40	14 <sup>th</sup> FHBSN 6418	78.6	12.8	11.0	50	71	40.4	30.5
41	23 <sup>rd</sup> HRWSN 2002	81.0	13.6	9.9	50	41	41.8	34.3
42	23 <sup>rd</sup> HRWSN 2007	77.0	14.2	10.3	42	85	41.6	32.1
43	23 <sup>rd</sup> HRWSN 2015	77.0	13.6	10.1	49	65	41.5	34.3
44	23 <sup>rd</sup> HRWSN 2052	80.0	13.2	10.9	55	70	44.7	32.7
45	23 <sup>rd</sup> HRWSN 2108	79.7	12.3	10.2	58	66	40.8	29.9
46	23 <sup>rd</sup> HRWSN 2118	80.0	13.0	10.3	58	74	46.5	33.1
47	22 <sup>nd</sup> ISEPTON 6218	82.3	13.1	11.0	50	86	39.4	31.6
48	22 <sup>nd</sup> ISEPTON 6219	78.6	13.6	10.0	50	27	42.8	32.4
49	22 <sup>nd</sup> ISEPTON 6233	82.0	14.0	10.6	47	73	43.0	36.3
50	22 <sup>nd</sup> ISEPTON6234	82.4	14.0	10.9	50	69	38.9	35.6

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kgh)	Protein Content (%)	Moisture Content (%)	Sedimentation Vaue (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
51	22 <sup>nd</sup> ISEPTON 6237	77.0	14.0	11.0	55	78	38.4	29.7
52	22 <sup>nd</sup> ISEPTON 6246	77.0	13.9	10.1	51	66	41.2	32.5
53	22 <sup>nd</sup> ISEPTON 6249	79.7	13.9	9.8	54	67	42.3	32.5
54	20 <sup>th</sup> SAWYT 304	77.6	12.9	10.1	41	66	44.5	35.4
55	20 <sup>th</sup> SAWYT 305	80.0	13.7	10.6	42	72	44.0	34.8
56	20 <sup>th</sup> SAWYT 306	79.8	13.0	9.8	56	70	44.3	36.2
57	20 <sup>th</sup> SAWYT 308	80.0	13.1	10.3	57	78	43.7	30.5
58	20 <sup>th</sup> SAWYT 309	79.5	13.6	9.8	53	74	40.2	30.1
59	20 <sup>th</sup> SAWYT 315	82.0	12.1	9.8	52	39	41.0	31.3
60	20 <sup>th</sup> SAWYT 331	77.4	13.3	10.6	51	70	41.9	36.3
60A.	DBW 17 (C)	80.8	13.4	9.5	38	68	46.0	37.5
60B.	DBW 39 (C)	76.8	13.6	10.7	44	68	41.8	36.8
60C.	GW 322 (C)	78.6	13.6	10.4	41	71	42.0	35.7
61	20 <sup>th</sup> SAWYT 337	78.6	13.8	9.6	55	40	53.1	28.9
62	20 <sup>th</sup> SAWYT 338	79.3	12.4	10.8	60	64	46.7	29.3
63	20 <sup>th</sup> SAWYT 339	82.3	11.1	11.2	47	74	45.1	29.1
64	20 <sup>th</sup> SAWYT 340	76.0	12.4	10.7	60	74	43.9	29.9
65	20 <sup>th</sup> SAWYT 343	80.2	12.6	10.0	47	67	45.1	34.4
66	20 <sup>th</sup> SAWYT 350	78.5	12.8	10.3	40	57	44.4	35.1
67	30 <sup>th</sup> SAWSN 3005	80.3	12.2	10.3	53	42	42.2	33.9
68	30 <sup>th</sup> SAWSN 3008	80.3	12.5	10.3	45	63	46.3	38.0
69	30 <sup>th</sup> SAWSN 3011	79.0	12.3	10.4	58	71	40.1	31.1
70	30 <sup>th</sup> SAWSN 3012	79.0	12.7	9.7	56	79	40.7	34.9
71	30 <sup>th</sup> SAWSN 3013	82.0	11.7	10.1	55	67	40.1	36.0
72	30 <sup>th</sup> SAWSN 3029	81.0	12.0	10.0	52	26	46.9	30.9
73	30 <sup>th</sup> SAWSN 3046	80.6	12.1	10.0	55	75	35.8	31.3
74	30 <sup>th</sup> SAWSN 3047	78.6	12.3	10.3	56	76	41.0	33.3
75	30 <sup>th</sup> SAWSN 3048	80.6	12.8	13.3	48	66	46.4	34.3

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Vaue (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
76	30 <sup>th</sup> SAWSN 3055	77.0	14.0	10.3	42	60	45.2	35.0
77	30 <sup>th</sup> SAWSN 3065	75.0	12.3	10.6	60	72	44.0	31.8
78	30 <sup>th</sup> SAWSN 3071	77.1	13.5	9.9	50	47	44.5	30.0
79	DBW 621-50	79.0	12.8	10.6	60	81	42.2	34.2
80	30 <sup>th</sup> SAWSN 3085	77.6	12.9	10.6	57	79	40.0	35.8
81	30 <sup>th</sup> SAWSN 3098	81.0	13.5	10.5	52	66	41.2	33.5
82	7 <sup>th</sup> EBWYT 516	76.8	13.4	10.3	54	64	39.7	31.9
83	7 <sup>th</sup> EBWYT 527	80.3	12.7	10.5	60	78	39.7	32.3
A.	DBW 17 (C)	81.3	12.7	9.9	37	72	41.9	37.9
B.	DBW 39 (C)	79.0	12.2	10.1	44	81	43.2	35.9
C.	GW 322 (C)	80.0	12.3	10.2	42	67	45.7	37.2
<b>Overall Mean</b>		<b>79.0</b>	<b>13.2</b>	<b>10.4</b>	<b>51</b>	<b>66</b>	<b>43.2</b>	<b>33.8</b>
<b>Overall Minimum</b>		<b>74.3</b>	<b>11.1</b>	<b>9.3</b>	<b>36</b>	<b>26</b>	<b>35.8</b>	<b>28.0</b>
<b>Overall Muximum</b>		<b>82.4</b>	<b>14.9</b>	<b>13.3</b>	<b>61</b>	<b>86</b>	<b>53.1</b>	<b>42.5</b>

**Table 12: Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nursery (EIGN-II)**

Sr. No	Cat.	Entry	Processing Quality					Nutritional Quality	
			Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
1	1	IDYN-1	81.5	12.1	11.5	23	91	39.1	37.3
2	2	IDYN-2	81.0	12.3	11.1	24	89	39.5	38.6
3	3	IDYN-5	81.0	12.5	10.7	33	82	34.9	31.7
4	4	IDYN-7	81.6	11.1	10.2	26	77	33.6	30.6
5	5	IDYN-10	79.5	12.1	11.0	38	89	33.4	30.9
6	6	IDYN-11	80.4	11.3	10.3	37	81	39.7	36.9
7	7	IDYN-13	81.6	13.9	11.2	38	99	39.5	33.8
8	8	IDYN-14	78.7	13.5	10.8	35	101	40.7	36.2
9	9	IDYN-16	80.7	13.4	11.0	40	94	38.7	35.6
10	10	IDYN-17	82.2	13.7	10.8	40	93	41.6	31.5
11	11	IDYN-18	76.0	14.0	10.4	38	87	38.8	31.0
12	12	IDYN-19	78.5	14.0	10.2	34	89	39.8	37.7
13	13	IDYN-20	82.4	13.5	10.4	36	100	39.8	34.1
14	14	IDYN-21	75.7	14.3	11.2	41	92	39.2	39.2
15	15	IDYN-25	82.6	12.2	10.3	40	88	39.5	33.6
16	16	IDYN-26	80.7	12.2	10.9	36	82	39.4	34.0
17	17	IDYN-29	80.6	13.1	10.6	38	83	39.8	39.2
18	18	IDYN-30	80.3	13.8	10.2	35	76	46.5	40.2
19	19	IDYN-31	80.0	12.2	10.5	40	78	40.4	31.8
20	20	IDYN-32	81.4	12.8	11.1	40	101	37.4	32.4
21	20A	PDW 291 (C)	78.4	13.0	12.0	27	82	43.3	38.1
22	20B	HI 8498 (C)	82.0	13.6	10.1	33	91	45.9	37.0
23	21	IDYN-33	80.0	14.1	10.5	37	88	46.2	31.7
24	22	IDYN-36	82.4	13.5	10.9	40	96	45.4	39.7
25	23	IDYN-38	74.0	13.6	10.2	37	99	38.9	28.9

Sr. No	Cat.	Entry	Processing Quality					Nutritional Quality	
			Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
26	24	IDYN-41	74.2	13.5	10.4	40	101	41.3	32.4
27	25	IDYN-42	76.3	13.3	10.5	40	95	44.2	35.0
28	26	IDYN-43	74.2	12.1	10.6	40	91	47.4	31.3
29	27	IDYN-45	74.0	12.8	9.7	34	83	45.0	29.3
30	28	IDYN-49	82.0	12.5	10.9	40	98	43.0	37.7
31	29	IDYN-50	79.0	12.4	10.6	40	100	35.4	32.8
32	30	IDSN-1	81.5	13.0	11.0	26	93	39.1	34.7
33	31	IDSN-7	81.0	12.7	9.9	29	87	35.2	31.2
34	32	IDSN-11	82.0	12.0	10.5	38	84	38.2	31.5
35	33	IDSN-21	82.0	12.5	10.6	39	87	34.9	33.6
36	34	IDSN-22	78.2	12.9	10.5	36	84	43.9	44.0
37	35	IDSN-26	80.0	12.3	10.6	34	80	37.5	29.7
38	36	IDSN-33	81.4	12.7	11.0	39	84	37.7	35.7
39	37	IDSN-36	83.2	13.0	10.7	33	87	40.6	33.5
40	38	IDSN-43	82.8	13.1	11.1	41	81	40.0	31.2
41	39	IDSN-49	82.7	13.1	10.8	33	99	39.8	34.0
42	40	IDSN-57	79.6	14.7	10.6	34	93	43.4	32.4
43	40A	PDW 291 (C)	82.0	13.9	10.5	26	88	47.6	36.1
44	40B	HI 8498 (C)	81.0	14.6	11.3	34	79	45.0	34.4
45	41	IDSN-59	80.5	12.4	10.6	41	88	37.1	32.5
46	42	IDSN-61	81.0	13.7	10.1	40	70	43.9	30.7
47	43	IDSN-67	77.0	13.8	10.6	36	86	39.7	31.5
48	44	IDSN-70	79.6	13.8	10.3	35	89	43.5	34.7
49	45	IDSN-71	77.4	12.3	10.5	40	85	39.9	32.0
50	46	IDSN-73	78.2	12.2	11.1	31	86	37.8	33.4



Sr. No	Cat.	Entry	Processing Quality					Nutritional Quality	
			Test Weight (kgh)	Protein Content (%)	Moisture Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
51	47	IDSN-77	81.0	12.5	11.1	36	92	38.3	32.2
52	48	IDSN-78	81.0	10.7	10.4	33	84	39.0	40.4
53	49	IDSN-81	82.3	11.7	10.1	37	77	37.4	26.0
54	50	IDSN-83	81.0	12.4	10.6	38	82	36.9	33.7
55	51	IDSN-84	80.2	12.1	10.1	37	67	33.9	33.4
56	52	IDSN-85	80.0	11.8	10.1	39	71	37.7	30.2
57	53	IDSN-87	81.7	13.5	10.8	40	84	36.9	34.3
58	54	IDSN-93	79.0	13.9	10.8	35	90	40.3	34.0
59	55	IDSN-97	82.0	13.0	10.6	26	96	42.3	32.5
60	56	IDSN-105	79.5	14.0	10.7	33	86	40.5	38.2
61	57	IDSN-117	76.3	14.1	11.5	40	77	45.3	40.1
62	58	IDSN-121	80.5	12.8	10.6	41	93	40.7	36.3
63	59	IDSN-126	80.3	13.7	11.0	37	93	42.3	35.8
64	60	IDSN-143	78.2	14.1	10.8	39	94	40.1	41.1
65	60A	PDW 291 (C)	80.5	13.9	10.5	28	96	47.6	43.5
66	60B	HI 8498 (C)	81.0	13.6	11.3	32	92	47.9	40.3
<b>Overall Mean</b>			<b>80.0</b>	<b>13.0</b>	<b>10.7</b>	<b>36</b>	<b>88</b>	<b>40.4</b>	<b>34.5</b>
<b>Overall Minimum</b>			<b>74.0</b>	<b>10.7</b>	<b>9.7</b>	<b>23</b>	<b>67</b>	<b>33.4</b>	<b>26.0</b>
<b>Overall Maximum</b>			<b>83.2</b>	<b>14.7</b>	<b>12.0</b>	<b>41</b>	<b>101</b>	<b>47.9</b>	<b>44.0</b>

# **SECTION E**

## **WHEAT PRODUCTS EVALUATION**

- i. Chapati**
- ii. Bread**
- iii. Biscuit**
- iv. Pasta**

## WHEAT PRODUCTS EVALUATION

The 2<sup>nd</sup> year AVT entries including checks were evaluated for chapati, bread & biscuit from *T. aestivum* and pasta products from *T. durum* in all the centres, sowing conditions and zones. Various aspects covered in this chapter are chapatti quality (maximum score 10.0), phenol test (maximum score 10.0), bread loaf volume (ml), bread loaf volume (ml)/dough weight (g), bread quality (maximum score 10.0), extraction rate (%), wet gluten (%), dry gluten (%), gluten index, biscuit diameter (cm), biscuit spread factor of *T. aestivum*, pasta cooking quality and pasta sensory evaluation of *T. durum*.

### Chapati Quality (Table 1-12)

For the evaluation of chapatti quality (Table 1-6), various parameters like water absorption, nature & colour of dough (before and after maturation), chapati appearance, colour, aroma, taste, puffing height, pliability and loss of water (just after and after 4 hrs of baking) were considered and the score was given out of 10.0. Among the 2<sup>nd</sup> year entries, WH 1129 (ILS, NWPZ) and MP 3382 (ITS, CZ) made excellent chapatti scoring >8.0 score out of 10.0. Among the checks, C 306, K 8027, HD 2888 (RTS, NEPZ), HD 2864, HD 2932, MP 3336 (ILS, CZ), HI 1500 (RTS, RITS, CZ), MACS 6478 (ITS, PZ), HD 2932 (ILS, PZ) and NIAW 1415 (RTS, PZ) also recorded >8.0 score.

The phenol test (table 7-12) was carried out on all the samples. In this test, about 100 wheat grains were taken in a tube and 1.0% phenol solution was added so as to submerge the grains. After two hours, the solution was drained and grains were dried on a filter paper. The grains of *T.aestivum* turned light brown, medium brownish black and dark brownish black. Depending upon the degree of darkness, score was given out of 10.0. The phenol test score was found to correlate negatively with chapatti quality score. The entries which made excellent chapatti with >8.0 score invariably developed very light brown colour. This technique is simple and can be easily used in screening the genotypes for chapatti. Since different varieties develop different degree of darkness, this technique may be used in identifying mixtures of wheat varieties.

**Table 1: Chapati Quality (Max-10) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	7.71	7.58	7.40	<b>7.56</b>
2. VL 804 (C)	01	7.77	7.61	7.81	<b>7.73</b>
3. VL 907 (C)	04	7.61	7.58	6.51	<b>7.23</b>
4. HS 507 (C)	03	7.58	7.47	7.41	<b>7.49</b>
5. HPW 349 (C)	05	7.53	7.47	7.38	<b>7.46</b>
<b>Mean</b>		<b>7.64</b>	<b>7.54</b>	<b>7.30</b>	<b>7.49</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	7.67	7.77	7.45	<b>7.63</b>
2. VL 804 (C)	01	7.71	7.58	7.77	<b>7.69</b>
3. VL 907 (C)	04	7.58	7.67	6.47	<b>7.24</b>
4. HS 507 (C)	03	7.51	7.67	7.45	<b>7.54</b>
5. HPW 349 (C)	05	7.61	7.53	7.40	<b>7.51</b>
<b>Mean</b>		<b>7.62</b>	<b>7.64</b>	<b>7.31</b>	<b>7.52</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	7.77	7.58	7.61	<b>7.65</b>
2. HS 277 (C)	12	6.95	7.11	6.88	<b>6.98</b>
3. VL 829 (C)	13	6.83	7.05	6.95	<b>6.94</b>
4. HPW 251 (C)	03	7.77	7.61	7.81	<b>7.73</b>
5. HS 542 (I)	09	7.81	7.73	7.68	<b>7.74</b>
<b>Mean</b>		<b>7.43</b>	<b>7.42</b>	<b>7.39</b>	<b>7.41</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	6.86	6.95	7.05	<b>6.95</b>
2. HS 490 (C)	08	6.77	6.95	7.11	<b>6.94</b>
<b>Mean</b>		<b>6.82</b>	<b>6.95</b>	<b>7.08</b>	<b>6.95</b>

**Table 2: Chapati Quality (Max-10) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	7.58	7.77	7.47	7.61	7.38	<b>7.56</b>
2. WH 1138	10	7.67	7.81	7.58	7.67	7.47	<b>7.64</b>
3. HUW 666	23	7.61	7.81	7.61	7.71	7.51	<b>7.65</b>
4. DPW 621-50(C)	15	7.61	7.71	7.58	7.41	7.50	<b>7.56</b>
5. HD 2967 (C)	07	7.71	7.85	7.58	7.61	7.47	<b>7.64</b>
6. WH 1105 (C)	20	7.67	7.77	7.51	7.47	7.50	<b>7.58</b>
7. DBW 88 (I)	03	7.77	7.83	7.61	7.47	7.53	<b>7.64</b>
8. HD 3086 (I)	16	7.71	7.80	7.57	7.40	7.47	<b>7.59</b>
<b>Mean</b>		<b>7.67</b>	<b>7.79</b>	<b>7.56</b>	<b>7.54</b>	<b>7.48</b>	<b>7.61</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	7.95	8.11	8.00	7.91	8.05	<b>8.00</b>
2. PBW 590 (C)	10	7.51	7.67	7.47	7.38	7.61	<b>7.53</b>
3. WH 1021 (C)	05	7.48	7.61	7.38	7.41	7.48	<b>7.47</b>
4. HD 3059 (C)	06	7.67	7.81	7.58	7.61	7.67	<b>7.67</b>
5. DBW 90 (I)	09	7.61	7.77	7.50	7.58	7.61	<b>7.61</b>
6. WH 1124 (I)	04	7.51	7.67	7.38	7.40	7.48	<b>7.49</b>
<b>Mean</b>		<b>7.62</b>	<b>7.77</b>	<b>7.55</b>	<b>7.55</b>	<b>7.65</b>	<b>7.63</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	7.61	-	7.71	-	7.38	<b>7.57</b>
2. WH 1080 (C)	04	7.67	-	7.77	-	7.51	<b>7.65</b>
3. PBW 660 (I)	01	7.87	-	8.11	-	7.95	<b>7.98</b>
<b>Mean</b>		<b>7.72</b>	-	<b>7.86</b>	-	<b>7.61</b>	<b>7.73</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	7.54	-	7.61	7.38	7.41	<b>7.49</b>
2. PBW 644 (C)	03	7.61	-	7.67	7.40	7.33	<b>7.50</b>
3. WH 1080 (C)	04	7.67	-	7.77	7.50	7.38	<b>7.58</b>
4. HD 3043 (C)	06	7.58	-	7.67	7.50	7.40	<b>7.54</b>
<b>Mean</b>		<b>7.60</b>	-	<b>7.68</b>	<b>7.45</b>	<b>7.38</b>	<b>7.53</b>

**Table 3: Chapati Quality (Max-10) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	7.77	7.61	7.58	<b>7.65</b>
2. DBW 39 (C)	08	7.81	7.77	7.67	<b>7.75</b>
3. HD 2733 (C)	05	7.85	7.70	7.61	<b>7.72</b>
4. NW 5054 (I)	06	7.67	7.58	7.38	<b>7.54</b>
5. K 1006 (I)	13	7.71	7.61	7.48	<b>7.60</b>
<b>Mean</b>		<b>7.76</b>	<b>7.65</b>	<b>7.54</b>	<b>7.65</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	7.67	7.50	7.40	<b>7.52</b>
2. DBW 107	03	7.71	7.67	7.58	<b>7.65</b>
3. K 1114	08	7.61	7.58	7.40	<b>7.53</b>
4. NW 2036 (C)	13	7.61	7.58	7.40	<b>7.53</b>
5. DBW 14 (C)	12	7.71	7.61	7.58	<b>7.63</b>
6. HD 2985 (C)	01	7.67	7.50	7.38	<b>7.52</b>
7. HI 1563 (C)	09	8.20	8.05	7.95	<b>8.07</b>
<b>Mean</b>		<b>7.74</b>	<b>7.64</b>	<b>7.53</b>	<b>7.64</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	7.71	7.67	7.58	<b>7.65</b>
2. C 306 (C)	03	8.25	8.11	7.95	<b>8.10</b>
3. K 8027 (C)	05	8.11	8.05	7.95	<b>8.04</b>
4. HD 2888 (C)	04	8.20	8.11	7.88	<b>8.06</b>
<b>Mean</b>		<b>8.07</b>	<b>7.99</b>	<b>7.84</b>	<b>7.96</b>

**Table 4: Chapati Quality (Max-10) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	8.11	7.95	8.20	7.88	8.00	<b>8.03</b>
2. GW 322 (C)	09	7.58	7.48	7.77	7.67	7.50	<b>7.60</b>
3. HI 1544 (C)	10	7.61	7.55	7.67	7.58	7.40	<b>7.56</b>
<b>Mean</b>		<b>7.77</b>	<b>7.66</b>	<b>7.88</b>	<b>7.71</b>	<b>7.63</b>	<b>7.73</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	7.77	7.67	7.88	7.71	7.67	<b>7.74</b>
2. HD 2864 (C)	03	8.11	7.95	8.20	8.05	7.95	<b>8.05</b>
3. HD 2932 (C)	01	8.20	7.88	8.25	8.05	7.95	<b>8.07</b>
4. MP 3336 (C)	04	8.11	8.00	8.15	7.95	7.90	<b>8.02</b>
<b>Mean</b>		<b>8.05</b>	<b>7.88</b>	<b>8.12</b>	<b>7.94</b>	<b>7.87</b>	<b>7.97</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	7.88	7.77	-	-	-	<b>7.83</b>
2. PBW 689	17	7.81	7.77	-	-	-	<b>7.79</b>
3. WH 1142	01	7.95	7.80	-	-	-	<b>7.88</b>
4. HI 1500 (C)	16	8.20	8.11	-	-	-	<b>8.16</b>
5. MP 3288 (C)	15	7.77	7.61	-	-	-	<b>7.69</b>
<b>Mean</b>		<b>7.92</b>	<b>7.81</b>	-	-	-	<b>7.87</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	7.88	7.77	-	-	-	<b>7.83</b>
2. HI 1500 (C)	01	8.11	8.05	-	-	-	<b>8.08</b>
3. MP 3288 (C)	02	8.20	8.11	-	-	-	<b>8.16</b>
4. HI 8627 (C) (d)	04	7.95	7.90	-	-	-	<b>7.93</b>
<b>Mean</b>		<b>8.04</b>	<b>7.96</b>	-	-	-	<b>8.00</b>

**Table 5: Chapati Quality (Max-10) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	7.71	7.67	7.55	<b>7.64</b>
2. MACS 6478 (I)	04	8.20	8.11	7.95	<b>8.09</b>
<b>Mean</b>		<b>7.96</b>	<b>7.89</b>	<b>7.75</b>	<b>7.87</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	8.20	8.00	7.95	<b>8.05</b>
2. Raj 4083 (C)	02	7.81	7.77	7.68	<b>7.75</b>
3. HD 3090 (I)	04	7.71	7.61	7.55	<b>7.62</b>
<b>Mean</b>		<b>7.91</b>	<b>7.79</b>	<b>7.73</b>	<b>7.81</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	7.61	-	<b>7.61</b>
2. NIAW 1994	05	-	7.77	-	<b>7.77</b>
3. NI 5439 (C)	02	-	7.67	-	<b>7.67</b>
4. NIAW 1415 (C)	06	-	8.05	-	<b>8.05</b>
<b>Mean</b>		-	<b>7.78</b>	-	<b>7.78</b>

**Table 6: Chapati Quality (Max-10) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	7.77	7.61	7.48	7.38	<b>7.56</b>
2. HW 2044 (C)	05	7.65	7.58	7.40	7.55	<b>7.55</b>
3. HW 5216 (C)	02	7.71	7.50	7.35	7.40	<b>7.49</b>
<b>Mean</b>		<b>7.71</b>	<b>7.56</b>	<b>7.41</b>	<b>7.44</b>	<b>7.53</b>

**Table 7: Phenol Test (Max-10) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	6.5	6.0	6.0	<b>6.2</b>
2. VL 804 (C)	01	5.0	5.5	4.5	<b>5.0</b>
3. VL 907 (C)	04	6.5	7.5	7.0	<b>7.0</b>
4. HS 507 (C)	03	5.5	6.5	6.0	<b>6.0</b>
5. HPW 349 (C)	05	6.0	6.5	6.0	<b>6.2</b>
<b>Mean</b>		<b>5.9</b>	<b>6.4</b>	<b>5.9</b>	<b>6.1</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	7.0	6.5	6.0	<b>6.5</b>
2. VL 804 (C)	01	5.5	5.0	5.0	<b>5.2</b>
3. VL 907 (C)	04	6.5	7.5	7.0	<b>7.0</b>
4. HS 507 (C)	03	6.0	5.5	6.5	<b>6.0</b>
5. HPW 349 (C)	05	6.5	6.5	6.0	<b>6.3</b>
<b>Mean</b>		<b>6.3</b>	<b>6.2</b>	<b>6.1</b>	<b>6.2</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	6.0	5.5	6.5	<b>6.0</b>
2. HS 277 (C)	12	7.5	7.0	8.0	<b>7.5</b>
3. VL 829 (C)	13	7.0	6.5	6.5	<b>6.7</b>
4. HPW 251 (C)	03	4.0	4.5	4.0	<b>4.2</b>
5. HS 542 (I)	09	4.0	4.0	4.5	<b>4.2</b>
<b>Mean</b>		<b>5.7</b>	<b>5.5</b>	<b>5.9</b>	<b>5.7</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	6.5	7.0	6.5	<b>6.7</b>
2. HS 490 (C)	08	6.0	7.0	6.5	<b>6.5</b>
<b>Mean</b>		<b>6.3</b>	<b>7.0</b>	<b>6.5</b>	<b>6.6</b>

**Table 8: Phenol Test (Max-10) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	7.0	6.5	7.5	7.0	7.5	<b>7.1</b>
2. WH 1138	10	6.5	7.0	7.5	6.5	7.0	<b>6.9</b>
3. HUW 666	23	6.0	5.5	6.0	6.5	5.5	<b>5.9</b>
4. DPW 621-50(C)	15	7.0	7.5	6.5	8.0	7.0	<b>7.2</b>
5. HD 2967 (C)	07	5.5	6.0	5.0	6.0	6.5	<b>5.8</b>
6. WH 1105 (C)	20	7.5	7.0	6.5	7.0	7.5	<b>7.1</b>
7. DBW 88 (I)	03	7.0	7.0	6.5	7.5	6.0	<b>6.8</b>
8. HD 3086 (I)	16	6.5	7.0	6.5	7.0	6.0	<b>6.6</b>
<b>Mean</b>		<b>6.6</b>	<b>6.7</b>	<b>6.5</b>	<b>6.9</b>	<b>6.6</b>	<b>6.7</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	3.5	3.0	4.0	3.0	4.5	<b>3.6</b>
2. PBW 590 (C)	10	7.5	7.0	8.0	7.5	7.0	<b>7.4</b>
3. WH 1021 (C)	05	6.5	6.0	7.5	7.0	7.0	<b>6.8</b>
4. HD 3059 (C)	06	7.0	7.5	6.5	6.0	7.5	<b>6.9</b>
5. DBW 90 (I)	09	6.0	5.5	6.5	6.0	6.5	<b>6.1</b>
6. WH 1124 (I)	04	6.5	6.0	6.5	7.0	6.0	<b>6.4</b>
<b>Mean</b>		<b>6.2</b>	<b>5.8</b>	<b>6.5</b>	<b>6.1</b>	<b>6.4</b>	<b>6.2</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	7.0	-	7.5	-	6.5	<b>7.0</b>
2. WH 1080 (C)	04	7.5	-	8.0	-	7.0	<b>7.5</b>
3. PBW 660 (I)	01	3.5	-	3.0	-	4.5	<b>3.7</b>
<b>Mean</b>		<b>6.0</b>	-	<b>6.2</b>	-	<b>6.0</b>	<b>6.1</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	7.0	-	7.5	7.0	6.5	<b>7.0</b>
2. PBW 644 (C)	03	7.5	-	7.0	6.5	7.0	<b>7.0</b>
3. WH 1080 (C)	04	6.5	-	7.0	7.5	7.0	<b>7.0</b>
4. HD 3043 (C)	06	6.0	-	6.5	7.0	6.5	<b>6.5</b>
<b>Mean</b>		<b>6.8</b>	-	<b>7.0</b>	<b>7.0</b>	<b>6.8</b>	<b>6.9</b>

**Table 9: Phenol Test (Max-10) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	6.0	6.5	6.5	<b>6.3</b>
2. DBW 39 (C)	08	4.5	4.0	4.0	<b>4.2</b>
3. HD 2733 (C)	05	7.5	8.0	7.0	<b>7.5</b>
4. NW 5054 (I)	06	7.0	7.5	7.5	<b>7.3</b>
5. K 1006 (I)	13	6.5	7.5	7.0	<b>7.0</b>
<b>Mean</b>		<b>6.3</b>	<b>6.7</b>	<b>6.4</b>	<b>6.5</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	6.0	6.5	7.0	<b>6.5</b>
2. DBW 107	03	5.5	5.0	5.0	<b>5.2</b>
3. K 1114	08	6.0	5.5	7.0	<b>6.2</b>
4. NW 2036 (C)	13	6.5	6.0	6.5	<b>6.3</b>
5. DBW 14 (C)	12	6.5	7.0	6.0	<b>6.5</b>
6. HD 2985 (C)	01	7.5	8.0	7.0	<b>7.5</b>
7. HI 1563 (C)	09	3.0	2.5	3.5	<b>3.0</b>
<b>Mean</b>		<b>5.9</b>	<b>5.8</b>	<b>6.0</b>	<b>5.9</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	5.5	6.0	6.5	<b>6.0</b>
2. C 306 (C)	03	3.0	2.5	3.0	<b>2.8</b>
3. K 8027 (C)	05	2.5	3.5	3.0	<b>3.0</b>
4. HD 2888 (C)	04	3.5	3.0	4.0	<b>3.5</b>
<b>Mean</b>		<b>3.6</b>	<b>3.8</b>	<b>4.1</b>	<b>3.8</b>

**Table 10: Phenol Test (Max-10) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	3.0	3.5	4.0	3.0	4.5	<b>3.6</b>
2. GW 322 (C)	09	6.5	7.0	7.5	7.0	6.5	<b>6.9</b>
3. HI 1544 (C)	10	6.0	6.5	7.0	7.0	6.0	<b>6.5</b>
<b>Mean</b>		<b>5.2</b>	<b>5.7</b>	<b>6.2</b>	<b>5.7</b>	<b>5.7</b>	<b>5.7</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	5.0	5.5	6.0	5.0	5.5	<b>5.4</b>
2. HD 2864 (C)	03	3.5	4.0	3.0	2.5	4.5	<b>3.5</b>
3. HD 2932 (C)	01	4.0	3.5	3.0	4.0	4.0	<b>3.7</b>
4. MP 3336 (C)	04	3.5	4.0	3.5	3.0	4.0	<b>3.6</b>
<b>Mean</b>		<b>4.0</b>	<b>4.3</b>	<b>3.9</b>	<b>3.6</b>	<b>4.5</b>	<b>4.1</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	5.5	6.0	-	-	-	<b>5.8</b>
2. PBW 689	17	5.0	6.0	-	-	-	<b>5.5</b>
3. WH 1142	01	5.5	5.5	-	-	-	<b>5.5</b>
4. HI 1500 (C)	16	3.5	2.5	-	-	-	<b>3.0</b>
5. MP 3288 (C)	15	6.5	7.0	-	-	-	<b>6.8</b>
<b>Mean</b>		<b>5.2</b>	<b>5.4</b>	-	-	-	<b>5.3</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	5.5	6.0	-	-	-	<b>5.8</b>
2. HI 1500 (C)	01	3.0	2.5	-	-	-	<b>2.8</b>
3. MP 3288 (C)	02	3.5	2.5	-	-	-	<b>3.0</b>
4. HI 8627 (C) (d)	04	1.5	1.0	-	-	-	<b>1.3</b>
<b>Mean</b>		<b>3.4</b>	<b>3.0</b>	-	-	-	<b>3.2</b>



**Table 11: Phenol Test (Max-10) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	7.0	7.5	6.5	<b>7.0</b>
2. MACS 6478 (I)	04	3.0	3.5	2.5	<b>3.0</b>
<b>Mean</b>		<b>5.0</b>	<b>5.5</b>	<b>4.5</b>	<b>5.0</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	3.0	2.5	3.5	<b>3.0</b>
2. Raj 4083 (C)	02	6.0	5.5	6.5	<b>6.0</b>
3. HD 3090 (I)	04	6.5	6.0	6.5	<b>6.3</b>
<b>Mean</b>		<b>5.2</b>	<b>4.7</b>	<b>5.5</b>	<b>5.1</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	6.5	-	<b>6.5</b>
2. NIAW 1994	05	-	5.0	-	<b>5.0</b>
3. NI 5439 (C)	02	-	6.5	-	<b>6.5</b>
4. NIAW 1415 (C)	06	-	3.5	-	<b>3.5</b>
<b>Mean</b>		-	<b>5.4</b>	-	<b>5.4</b>

**Table 12: Phenol Test (Max-10) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	6.5	7.0	7.5	7.0	<b>7.0</b>
2. HW 2044 (C)	05	8.0	8.5	7.5	8.0	<b>8.0</b>
3. HW 5216 (C)	02	7.0	6.5	7.0	7.5	<b>7.0</b>
<b>Mean</b>		<b>7.2</b>	<b>7.3</b>	<b>7.3</b>	<b>7.5</b>	<b>7.3</b>

### **Bread Quality (Table 13-54)**

Among various parameters, loaf volume (Table 13-18) is considered most important and is given maximum weight age while evaluating bread quality. The 2<sup>nd</sup> year AVT entries namely, UAS 347 and NIAW 1994 (RTS, PZ) made comparatively better bread recording >575 ml bread loaf volume. Among the checks, NW 2036 (ILS, NEPZ), MACS 6222 (ITS, PZ), HD 2932, Raj 4083, HD 3090 (ILS, PZ), NI 5439 and NIAW 1415 (RTS, PZ) gave loaf volume of >575 ml. In general, bread loaf volume was comparatively better in PZ. For the evaluation bread quality (Table 19-24), various parameters like loaf volume, stickiness, appearance, crust colour, texture, taste and aroma were considered and the score was given out of 10.0. All the prementioned genotypes, which were found well in loaf volume, gave high bread quality score. The ratio of bread loaf volume (ml) / dough weight (g) is considered important, while evaluating bread quality, value of >3.5 is considered appropriate for good quality bread. All the prementioned genotypes which were found good in loaf volume gave a value of ~3.5 (Table 25-30).

Extraction rate (Table 31-36) is important parameters for millers, who are interested in a wheat variety with higher flour recovery. Among the checks, DBW 90, WH 1124 (ILS, NWPZ), K 0307 (ITS, NEPZ), HI 1563 (ILS, NEPZ), C 306 (RTS, NEPZ), Raj 4083 (ILS, PZ), NI 5439 (RTS, PZ) and COW (W) 1 (RITS, SHZ) recorded >72.0% extraction rate. None of 2<sup>nd</sup> year entry could match these superior checks. The extraction rate was comparatively lower in NHZ.

Gluten (Table 37-54) is associated with the quality of the end products of wheat. The data on wet gluten are presented in Table 37-42. The 2<sup>nd</sup> year entries, MP 3382 (ITS, CZ) and PBW 689 (RTS, CZ) recorded >32.0% wet gluten. Among the checks, HI 1544 (ITS, CZ), MP 4010, HD 2932, MP 3336 (ILS, CZ), MACS 6222, MACS 6478 (ITS, PZ), HD 2932 (ILS, PZ), NIAW 1415 (RTS, PZ) and HW 5216 (RITS, SHZ) also had >32.0% wet gluten. Similarly, the 2<sup>nd</sup> entries, MP 3382 (ITS, CZ), NIAW 1885, PBW 689 (ILS, CZ) exhibited

>10.0 dry gluten. Among the checks, PBW 660 (RTS, NWPZ), HD 2932, MP 3336 (ILS, CZ), HI 1500 (RTS, CZ), MACS 6222, MACS 6478 (ITS, PZ), HD 2932 (ILS, PZ), NIAW 1415 (RTS, PZ) and HW 5216 (RITS, SHZ) had >10.0% dry gluten. The data on gluten index are presented in table 49-54 and is calculated from the portion retained when the wet gluten is passed through the glutamate centrifuge. It is positively correlated with the gluten strength of the wheat flour. The 2<sup>nd</sup> year entries, VL 967 (ITS, RTS, NHZ), HPW 376 (RES, NHZ), PBW 681, WH 1138, HUW 666 (ITS, NWPZ) recorded >75 gluten index. Similarly, the checks namely, HPW 349 (ITS, RTS, NHZ), DPW 621-50, WH 1105, DBW 88, HD 3086 (ITS, NWPZ), HD 3059, DBW 90 (ILS, NWPZ) also exhibited >75 gluten index. In general, Indian wheat need improvement in this parameter.

**Table 13: Bread Loaf Volume (ml) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	560	550	540	<b>550</b>
2. VL 804 (C)	01	555	540	535	<b>543</b>
3. VL 907 (C)	04	560	545	540	<b>548</b>
4. HS 507 (C)	03	560	535	535	<b>543</b>
5. HPW 349 (C)	05	555	540	545	<b>547</b>
<b>Mean</b>		<b>558</b>	<b>542</b>	<b>539</b>	<b>546</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	565	545	535	<b>548</b>
2. VL 804 (C)	01	560	545	530	<b>545</b>
3. VL 907 (C)	04	555	550	545	<b>550</b>
4. HS 507 (C)	03	560	540	545	<b>548</b>
5. HPW 349 (C)	05	555	545	535	<b>545</b>
<b>Mean</b>		<b>559</b>	<b>545</b>	<b>538</b>	<b>547</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	540	530	515	<b>528</b>
2. HS 277 (C)	12	535	525	520	<b>527</b>
3. VL 829 (C)	13	530	515	510	<b>518</b>
4. HPW 251 (C)	03	535	520	515	<b>523</b>
5. HS 542 (I)	09	540	520	510	<b>523</b>
<b>Mean</b>		<b>536</b>	<b>522</b>	<b>514</b>	<b>524</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	515	495	490	<b>500</b>
2. HS 490 (C)	08	510	490	490	<b>497</b>
<b>Mean</b>		<b>513</b>	<b>493</b>	<b>490</b>	<b>498</b>

**Table 14: Bread Loaf Volume (ml) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	565	575	555	550	545	<b>558</b>
2. WH 1138	10	570	580	575	555	560	<b>568</b>
3. HUW 666	23	575	580	570	560	565	<b>570</b>
4. DPW 621-50(C)	15	560	575	570	555	565	<b>565</b>
5. HD 2967 (C)	07	565	580	565	560	560	<b>566</b>
6. WH 1105 (C)	20	570	580	575	550	555	<b>566</b>
7. DBW 88 (I)	03	565	575	570	550	560	<b>564</b>
8. HD 3086 (I)	16	570	575	560	555	550	<b>562</b>
<b>Mean</b>		<b>568</b>	<b>578</b>	<b>568</b>	<b>554</b>	<b>558</b>	<b>565</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	580	575	570	565	570	<b>572</b>
2. PBW 590 (C)	10	570	580	560	555	550	<b>563</b>
3. WH 1021 (C)	05	575	580	570	565	560	<b>570</b>
4. HD 3059 (C)	06	580	580	570	560	565	<b>571</b>
5. DBW 90 (I)	09	570	575	570	560	560	<b>567</b>
6. WH 1124 (I)	04	575	575	570	565	565	<b>570</b>
<b>Mean</b>		<b>575</b>	<b>578</b>	<b>568</b>	<b>562</b>	<b>562</b>	<b>569</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	560	-	555	-	550	<b>555</b>
2. WH 1080 (C)	04	570	-	565	-	560	<b>565</b>
3. PBW 660 (I)	01	575	-	560	-	555	<b>563</b>
<b>Mean</b>		<b>568</b>	-	<b>560</b>	-	<b>555</b>	<b>561</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	570	-	575	560	565	<b>568</b>
2. PBW 644 (C)	03	560	-	565	550	545	<b>555</b>
3. WH 1080 (C)	04	570	-	575	565	555	<b>566</b>
4. HD 3043 (C)	06	565	-	570	540	545	<b>555</b>
<b>Mean</b>		<b>566</b>	-	<b>571</b>	<b>554</b>	<b>553</b>	<b>561</b>

**Table 15: Bread Loaf Volume (ml) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	570	575	560	<b>568</b>
2. DBW 39 (C)	08	565	580	565	<b>570</b>
3. HD 2733 (C)	05	570	580	560	<b>570</b>
4. NW 5054 (I)	06	560	555	550	<b>555</b>
5. K 1006 (I)	13	570	575	570	<b>572</b>
<b>Mean</b>		<b>567</b>	<b>573</b>	<b>561</b>	<b>567</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	575	570	560	<b>568</b>
2. DBW 107	03	575	580	565	<b>573</b>
3. K 1114	08	570	580	560	<b>570</b>
4. NW 2036 (C)	13	580	585	575	<b>580</b>
5. DBW 14 (C)	12	570	565	560	<b>565</b>
6. HD 2985 (C)	01	575	570	565	<b>570</b>
7. HI 1563 (C)	09	575	575	560	<b>570</b>
<b>Mean</b>		<b>574</b>	<b>575</b>	<b>564</b>	<b>571</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	525	545	530	<b>533</b>
2. C 306 (C)	03	505	480	495	<b>493</b>
3. K 8027 (C)	05	495	480	495	<b>490</b>
4. HD 2888 (C)	04	510	485	490	<b>495</b>
<b>Mean</b>		<b>509</b>	<b>498</b>	<b>503</b>	<b>503</b>

**Table 16: Bread Loaf Volume (ml) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	530	545	550	525	515	<b>533</b>
2. GW 322 (C)	09	515	530	490	495	505	<b>507</b>
3. HI 1544 (C)	10	510	520	495	485	505	<b>503</b>
<b>Mean</b>		<b>518</b>	<b>532</b>	<b>512</b>	<b>502</b>	<b>508</b>	<b>514</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	570	555	575	550	560	<b>562</b>
2. HD 2864 (C)	03	560	550	570	540	555	<b>555</b>
3. HD 2932 (C)	01	565	555	570	545	550	<b>557</b>
4. MP 3336 (C)	04	560	550	565	540	535	<b>550</b>
<b>Mean</b>		<b>564</b>	<b>553</b>	<b>570</b>	<b>544</b>	<b>550</b>	<b>556</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	560	550	-	-	-	<b>555</b>
2. PBW 689	17	565	555	-	-	-	<b>560</b>
3. WH 1142	01	570	560	-	-	-	<b>565</b>
4. HI 1500 (C)	16	540	530	-	-	-	<b>535</b>
5. MP 3288 (C)	15	560	550	-	-	-	<b>555</b>
<b>Mean</b>		<b>559</b>	<b>549</b>	-	-	-	<b>554</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	560	550	-	-	-	<b>555</b>
2. HI 1500 (C)	01	545	535	-	-	-	<b>540</b>
3. MP 3288 (C)	02	555	545	-	-	-	<b>550</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>553</b>	<b>543</b>	-	-	-	<b>548</b>

**Table 17: Bread Loaf Volume (ml) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	585	580	575	<b>580</b>
2. MACS 6478 (I)	04	580	570	565	<b>572</b>
<b>Mean</b>		<b>583</b>	<b>575</b>	<b>570</b>	<b>576</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	585	580	575	<b>580</b>
2. Raj 4083 (C)	02	590	585	575	<b>583</b>
3. HD 3090 (I)	04	580	580	575	<b>578</b>
<b>Mean</b>		<b>585</b>	<b>582</b>	<b>575</b>	<b>581</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	580	-	<b>580</b>
2. NIAW 1994	05	-	585	-	<b>585</b>
3. NI 5439 (C)	02	-	585	-	<b>585</b>
4. NIAW 1415 (C)	06	-	585	-	<b>585</b>
<b>Mean</b>		-	<b>584</b>	-	<b>584</b>

**Table 18: Bread Loaf Volume (ml) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	550	540	545	550	<b>546</b>
2. HW 2044 (C)	05	555	545	550	555	<b>551</b>
3. HW 5216 (C)	02	550	555	540	545	<b>548</b>
<b>Mean</b>		<b>552</b>	<b>547</b>	<b>545</b>	<b>550</b>	<b>548</b>

**Table 19: Bread Quality (Max-10) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	6.71	6.47	6.33	<b>6.50</b>
2. VL 804 (C)	01	6.61	6.27	6.20	<b>6.36</b>
3. VL 907 (C)	04	6.67	6.35	6.23	<b>6.42</b>
4. HS 507 (C)	03	6.75	6.25	6.18	<b>6.39</b>
5. HPW 349 (C)	05	6.57	6.30	6.30	<b>6.39</b>
<b>Mean</b>		<b>6.66</b>	<b>6.33</b>	<b>6.25</b>	<b>6.41</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	6.77	6.40	6.32	<b>6.50</b>
2. VL 804 (C)	01	6.67	6.35	6.11	<b>6.38</b>
3. VL 907 (C)	04	6.52	6.47	6.40	<b>6.46</b>
4. HS 507 (C)	03	6.62	6.37	6.40	<b>6.46</b>
5. HPW 349 (C)	05	6.58	6.45	6.28	<b>6.44</b>
<b>Mean</b>		<b>6.63</b>	<b>6.41</b>	<b>6.30</b>	<b>6.45</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	6.35	6.11	5.67	<b>6.04</b>
2. HS 277 (C)	12	6.20	6.00	5.85	<b>6.02</b>
3. VL 829 (C)	13	6.15	5.75	5.35	<b>5.75</b>
4. HPW 251 (C)	03	6.25	5.80	5.80	<b>5.95</b>
5. HS 542 (I)	09	6.32	5.85	5.30	<b>5.82</b>
<b>Mean</b>		<b>6.25</b>	<b>5.90</b>	<b>5.59</b>	<b>5.92</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	5.55	4.95	4.85	<b>5.12</b>
2. HS 490 (C)	08	5.35	4.90	4.85	<b>5.03</b>
<b>Mean</b>		<b>5.45</b>	<b>4.93</b>	<b>4.85</b>	<b>5.08</b>

**Table 20: Bread Quality (Max-10) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	6.80	7.00	6.60	6.50	6.40	<b>6.66</b>
2. WH 1138	10	6.90	7.11	7.05	6.55	6.67	<b>6.86</b>
3. HUW 666	23	6.95	7.15	6.85	6.70	6.85	<b>6.90</b>
4. DPW 621-50(C)	15	6.67	7.05	6.90	6.50	6.80	<b>6.78</b>
5. HD 2967 (C)	07	6.82	7.18	6.85	6.70	6.67	<b>6.84</b>
6. WH 1105 (C)	20	6.88	7.25	7.11	6.55	6.58	<b>6.87</b>
7. DBW 88 (I)	03	6.85	6.98	6.88	6.52	6.70	<b>6.79</b>
8. HD 3086 (I)	16	6.85	7.05	6.70	6.60	6.55	<b>6.75</b>
<b>Mean</b>		<b>6.84</b>	<b>7.10</b>	<b>6.87</b>	<b>6.58</b>	<b>6.65</b>	<b>6.81</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	7.11	7.05	6.92	6.80	6.95	<b>6.97</b>
2. PBW 590 (C)	10	6.88	7.15	6.70	6.61	6.48	<b>6.76</b>
3. WH 1021 (C)	05	7.00	7.10	6.95	6.75	6.67	<b>6.89</b>
4. HD 3059 (C)	06	7.15	7.22	7.00	6.72	6.77	<b>6.97</b>
5. DBW 90 (I)	09	6.90	7.00	6.90	6.70	6.67	<b>6.83</b>
6. WH 1124 (I)	04	6.98	7.05	6.95	6.75	6.70	<b>6.89</b>
<b>Mean</b>		<b>7.00</b>	<b>7.10</b>	<b>6.90</b>	<b>6.72</b>	<b>6.71</b>	<b>6.89</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	6.67	-	6.58	-	6.45	<b>6.57</b>
2. WH 1080 (C)	04	6.88	-	6.80	-	6.70	<b>6.79</b>
3. PBW 660 (I)	01	7.05	-	6.72	-	6.60	<b>6.79</b>
<b>Mean</b>		<b>6.87</b>	-	<b>6.70</b>	-	<b>6.58</b>	<b>6.72</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	6.88	-	6.98	6.72	6.80	<b>6.85</b>
2. PBW 644 (C)	03	6.67	-	6.77	6.52	6.40	<b>6.59</b>
3. WH 1080 (C)	04	6.92	-	7.05	6.82	6.60	<b>6.85</b>
4. HD 3043 (C)	06	6.77	-	6.90	6.42	6.48	<b>6.64</b>
<b>Mean</b>		<b>6.81</b>	-	<b>6.93</b>	<b>6.62</b>	<b>6.57</b>	<b>6.73</b>

**Table 21: Bread Quality (Max-10) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	6.92	7.11	6.73	<b>6.92</b>
2. DBW 39 (C)	08	6.82	7.18	6.85	<b>6.95</b>
3. HD 2733 (C)	05	6.95	7.22	6.67	<b>6.95</b>
4. NW 5054 (I)	06	6.70	6.60	6.50	<b>6.60</b>
5. K 1006 (I)	13	6.88	7.05	6.95	<b>6.96</b>
<b>Mean</b>		<b>6.85</b>	<b>7.03</b>	<b>6.74</b>	<b>6.88</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	7.15	7.00	6.85	<b>7.00</b>
2. DBW 107	03	7.11	7.20	6.90	<b>7.07</b>
3. K 1114	08	7.05	7.15	6.80	<b>7.00</b>
4. NW 2036 (C)	13	7.22	7.30	7.05	<b>7.19</b>
5. DBW 14 (C)	12	7.05	6.88	6.77	<b>6.90</b>
6. HD 2985 (C)	01	7.08	7.00	6.95	<b>7.01</b>
7. HI 1563 (C)	09	7.00	7.10	6.90	<b>7.00</b>
<b>Mean</b>		<b>7.09</b>	<b>7.09</b>	<b>6.89</b>	<b>7.02</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	6.00	6.42	6.10	<b>6.17</b>
2. C 306 (C)	03	5.25	4.85	5.00	<b>5.03</b>
3. K 8027 (C)	05	4.95	4.85	5.05	<b>4.95</b>
4. HD 2888 (C)	04	5.20	4.90	4.95	<b>5.02</b>
<b>Mean</b>		<b>5.35</b>	<b>5.26</b>	<b>5.28</b>	<b>5.29</b>

**Table 22: Bread Quality (Max-10) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	6.10	6.37	6.50	6.05	5.67	<b>6.14</b>
2. GW 322 (C)	09	5.60	6.10	5.05	5.10	5.20	<b>5.41</b>
3. HI 1544 (C)	10	5.40	5.80	5.10	4.95	5.22	<b>5.29</b>
<b>Mean</b>		<b>5.70</b>	<b>6.09</b>	<b>5.55</b>	<b>5.37</b>	<b>5.36</b>	<b>5.61</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	6.88	6.60	7.05	6.55	6.67	<b>6.75</b>
2. HD 2864 (C)	03	6.70	6.50	6.85	6.32	6.65	<b>6.60</b>
3. HD 2932 (C)	01	6.77	6.55	6.90	6.42	6.55	<b>6.64</b>
4. MP 3336 (C)	04	6.70	6.45	6.80	6.33	6.25	<b>6.51</b>
<b>Mean</b>		<b>6.76</b>	<b>6.53</b>	<b>6.90</b>	<b>6.41</b>	<b>6.53</b>	<b>6.62</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	6.67	6.48	-	-	-	<b>6.58</b>
2. PBW 689	17	6.75	6.60	-	-	-	<b>6.68</b>
3. WH 1142	01	6.85	6.70	-	-	-	<b>6.78</b>
4. HI 1500 (C)	16	6.32	6.11	-	-	-	<b>6.22</b>
5. MP 3288 (C)	15	6.67	6.45	-	-	-	<b>6.56</b>
<b>Mean</b>		<b>6.65</b>	<b>6.47</b>	-	-	-	<b>6.56</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	6.72	6.45	-	-	-	<b>6.59</b>
2. HI 1500 (C)	01	6.38	6.22	-	-	-	<b>6.30</b>
3. MP 3288 (C)	02	6.58	6.45	-	-	-	<b>6.52</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>6.56</b>	<b>6.37</b>	-	-	-	<b>6.47</b>



**Table 23: Bread Quality (Max-10) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	7.30	7.15	7.05	<b>7.17</b>
2. MACS 6478 (I)	04	7.20	7.00	6.80	<b>7.00</b>
<b>Mean</b>		<b>7.25</b>	<b>7.08</b>	<b>6.93</b>	<b>7.08</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	7.35	7.20	7.10	<b>7.22</b>
2. Raj 4083 (C)	02	7.45	7.30	7.15	<b>7.30</b>
3. HD 3090 (I)	04	7.15	7.25	7.05	<b>7.15</b>
<b>Mean</b>		<b>7.32</b>	<b>7.25</b>	<b>7.10</b>	<b>7.22</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	7.40	-	<b>7.40</b>
2. NIAW 1994	05	-	7.50	-	<b>7.50</b>
3. NI 5439 (C)	02	-	7.45	-	<b>7.45</b>
4. NIAW 1415 (C)	06	-	7.50	-	<b>7.50</b>
<b>Mean</b>		-	<b>6.71</b>	-	<b>6.71</b>

**Table 24: Bread Quality (Max-10) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	6.47	6.32	6.40	6.55	<b>6.44</b>
2. HW 2044 (C)	05	6.60	6.35	6.50	6.55	<b>6.50</b>
3. HW 5216 (C)	02	6.45	6.55	6.25	6.40	<b>6.41</b>
<b>Mean</b>		<b>6.51</b>	<b>6.41</b>	<b>6.38</b>	<b>6.50</b>	<b>6.45</b>

**Table 25: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	3.34	3.28	3.22	<b>3.28</b>
2. VL 804 (C)	01	3.31	3.22	3.19	<b>3.24</b>
3. VL 907 (C)	04	3.34	3.25	3.22	<b>3.27</b>
4. HS 507 (C)	03	3.34	3.19	3.19	<b>3.24</b>
5. HPW 349 (C)	05	3.31	3.22	3.25	<b>3.26</b>
<b>Mean</b>		<b>3.33</b>	<b>3.23</b>	<b>3.21</b>	<b>3.26</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	3.37	3.25	3.19	<b>3.27</b>
2. VL 804 (C)	01	3.34	3.25	3.16	<b>3.25</b>
3. VL 907 (C)	04	3.31	3.28	3.25	<b>3.28</b>
4. HS 507 (C)	03	3.34	3.22	3.25	<b>3.27</b>
5. HPW 349 (C)	05	3.31	3.25	3.19	<b>3.25</b>
<b>Mean</b>		<b>3.33</b>	<b>3.25</b>	<b>3.21</b>	<b>3.26</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	3.22	3.16	3.07	<b>3.15</b>
2. HS 277 (C)	12	3.19	3.13	3.10	<b>3.14</b>
3. VL 829 (C)	13	3.16	3.07	3.04	<b>3.09</b>
4. HPW 251 (C)	03	3.19	3.10	3.07	<b>3.12</b>
5. HS 542 (I)	09	3.22	3.10	3.04	<b>3.12</b>
<b>Mean</b>		<b>3.20</b>	<b>3.11</b>	<b>3.06</b>	<b>3.12</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	3.07	2.96	2.93	<b>2.99</b>
2. HS 490 (C)	08	3.04	2.93	2.93	<b>2.97</b>
<b>Mean</b>		<b>3.06</b>	<b>2.95</b>	<b>2.93</b>	<b>2.98</b>

**Table 26: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	3.37	3.43	3.31	3.28	3.25	<b>3.33</b>
2. WH 1138	10	3.40	3.46	3.43	3.31	3.34	<b>3.39</b>
3. HUW 666	23	3.43	3.46	3.40	3.34	3.37	<b>3.40</b>
4. DPW 621-50(C)	15	3.34	3.43	3.40	3.31	3.37	<b>3.37</b>
5. HD 2967 (C)	07	3.37	3.46	3.37	3.34	3.34	<b>3.38</b>
6. WH 1105 (C)	20	3.40	3.46	3.43	3.28	3.31	<b>3.38</b>
7. DBW 88 (I)	03	3.37	3.43	3.40	3.28	3.34	<b>3.36</b>
8. HD 3086 (I)	16	3.40	3.43	3.34	3.31	3.28	<b>3.35</b>
<b>Mean</b>		<b>3.39</b>	<b>3.45</b>	<b>3.39</b>	<b>3.31</b>	<b>3.33</b>	<b>3.37</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	3.46	3.43	3.40	3.37	3.40	<b>3.41</b>
2. PBW 590 (C)	10	3.40	3.46	3.34	3.31	3.28	<b>3.36</b>
3. WH 1021 (C)	05	3.43	3.46	3.40	3.37	3.34	<b>3.40</b>
4. HD 3059 (C)	06	3.46	3.46	3.40	3.34	3.37	<b>3.41</b>
5. DBW 90 (I)	09	3.40	3.43	3.40	3.34	3.34	<b>3.38</b>
6. WH 1124 (I)	04	3.43	3.43	3.40	3.37	3.37	<b>3.40</b>
<b>Mean</b>		<b>3.43</b>	<b>3.45</b>	<b>3.39</b>	<b>3.35</b>	<b>3.35</b>	<b>3.39</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	3.34	-	3.31	-	3.28	<b>3.31</b>
2. WH 1080 (C)	04	3.40	-	3.37	-	3.34	<b>3.37</b>
3. PBW 660 (I)	01	3.43	-	3.34	-	3.31	<b>3.36</b>
<b>Mean</b>		<b>3.39</b>	-	<b>3.34</b>	-	<b>3.31</b>	<b>3.35</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	3.40	-	3.43	3.34	3.37	<b>3.39</b>
2. PBW 644 (C)	03	3.34	-	3.37	3.28	3.25	<b>3.31</b>
3. WH 1080 (C)	04	3.40	-	3.43	3.37	3.31	<b>3.38</b>
4. HD 3043 (C)	06	3.37	-	3.40	3.22	3.25	<b>3.31</b>
<b>Mean</b>		<b>3.38</b>	-	<b>3.41</b>	<b>3.30</b>	<b>3.30</b>	<b>3.35</b>

**Table 27: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	3.40	3.43	3.34	<b>3.39</b>
2. DBW 39 (C)	08	3.37	3.46	3.37	<b>3.40</b>
3. HD 2733 (C)	05	3.40	3.46	3.34	<b>3.40</b>
4. NW 5054 (I)	06	3.34	3.31	3.28	<b>3.31</b>
5. K 1006 (I)	13	3.40	3.43	3.40	<b>3.41</b>
<b>Mean</b>		<b>3.38</b>	<b>3.42</b>	<b>3.35</b>	<b>3.38</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	3.43	3.40	3.34	<b>3.39</b>
2. DBW 107	03	3.43	3.46	3.37	<b>3.42</b>
3. K 1114	08	3.40	3.46	3.34	<b>3.40</b>
4. NW 2036 (C)	13	3.46	3.49	3.43	<b>3.46</b>
5. DBW 14 (C)	12	3.40	3.37	3.34	<b>3.37</b>
6. HD 2985 (C)	01	3.43	3.40	3.37	<b>3.40</b>
7. HI 1563 (C)	09	3.43	3.43	3.34	<b>3.40</b>
<b>Mean</b>		<b>3.43</b>	<b>3.43</b>	<b>3.36</b>	<b>3.41</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	3.13	3.25	3.16	<b>3.18</b>
2. C 306 (C)	03	3.01	2.87	2.96	<b>2.95</b>
3. K 8027 (C)	05	2.96	2.87	2.96	<b>2.93</b>
4. HD 2888 (C)	04	3.04	2.90	2.93	<b>2.96</b>
<b>Mean</b>		<b>3.04</b>	<b>2.97</b>	<b>3.00</b>	<b>3.00</b>

**Table 28: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	3.16	3.25	3.28	3.13	3.07	<b>3.18</b>
2. GW 322 (C)	09	3.07	3.16	2.93	2.96	3.01	<b>3.03</b>
3. HI 1544 (C)	10	3.04	3.10	2.96	2.90	3.01	<b>3.00</b>
<b>Mean</b>		<b>3.09</b>	<b>3.17</b>	<b>3.06</b>	<b>3.00</b>	<b>3.03</b>	<b>3.07</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	3.40	3.31	3.43	3.28	3.34	<b>3.35</b>
2. HD 2864 (C)	03	3.34	3.28	3.40	3.22	3.31	<b>3.31</b>
3. HD 2932 (C)	01	3.37	3.31	3.40	3.25	3.28	<b>3.32</b>
4. MP 3336 (C)	04	3.34	3.28	3.37	3.22	3.19	<b>3.28</b>
<b>Mean</b>		<b>3.36</b>	<b>3.30</b>	<b>3.40</b>	<b>3.24</b>	<b>3.28</b>	<b>3.32</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	3.34	3.28	-	-	-	<b>3.31</b>
2. PBW 689	17	3.37	3.31	-	-	-	<b>3.34</b>
3. WH 1142	01	3.40	3.34	-	-	-	<b>3.37</b>
4. HI 1500 (C)	16	3.22	3.16	-	-	-	<b>3.19</b>
5. MP 3288 (C)	15	3.34	3.28	-	-	-	<b>3.31</b>
<b>Mean</b>		<b>3.33</b>	<b>3.27</b>	-	-	-	<b>3.30</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	3.34	3.28	-	-	-	<b>3.31</b>
2. HI 1500 (C)	01	3.25	3.19	-	-	-	<b>3.22</b>
3. MP 3288 (C)	02	3.31	3.25	-	-	-	<b>3.28</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>3.30</b>	<b>3.24</b>	-	-	-	<b>3.27</b>

**Table 29: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	3.49	3.46	3.43	<b>3.46</b>
2. MACS 6478 (I)	04	3.46	3.40	3.37	<b>3.41</b>
<b>Mean</b>		<b>3.48</b>	<b>3.43</b>	<b>3.40</b>	<b>3.44</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	3.49	3.46	3.43	<b>3.46</b>
2. Raj 4083 (C)	02	3.52	3.49	3.43	<b>3.48</b>
3. HD 3090 (I)	04	3.46	3.46	3.43	<b>3.45</b>
<b>Mean</b>		<b>3.49</b>	<b>3.47</b>	<b>3.43</b>	<b>3.46</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	3.46	-	<b>3.46</b>
2. NIAW 1994	05	-	3.49	-	<b>3.49</b>
3. NI 5439 (C)	02	-	3.49	-	<b>3.49</b>
4. NIAW 1415 (C)	06	-	3.49	-	<b>3.49</b>
<b>Mean</b>		-	<b>3.48</b>	-	<b>3.48</b>

**Table 30: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	3.28	3.22	3.25	3.28	<b>3.26</b>
2. HW 2044 (C)	05	3.31	3.25	3.28	3.31	<b>3.29</b>
3. HW 5216 (C)	02	3.28	3.31	3.22	3.25	<b>3.27</b>
<b>Mean</b>		<b>3.29</b>	<b>3.26</b>	<b>3.25</b>	<b>3.28</b>	<b>3.27</b>

**Table 31: Extraction Rate (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	61.5	66.2	64.2	<b>64.0</b>
2. VL 804 (C)	01	67.1	62.6	63.5	<b>64.4</b>
3. VL 907 (C)	04	62.5	64.3	63.5	<b>63.4</b>
4. HS 507 (C)	03	63.7	66.1	64.2	<b>64.7</b>
5. HPW 349 (C)	05	60.5	63.5	62.1	<b>62.0</b>
<b>Mean</b>		<b>63.1</b>	<b>64.5</b>	<b>63.5</b>	<b>63.7</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	66.5	62.3	63.1	<b>64.0</b>
2. VL 804 (C)	01	67.2	64.3	63.2	<b>64.9</b>
3. VL 907 (C)	04	64.2	62.1	60.1	<b>62.1</b>
4. HS 507 (C)	03	65.1	63.1	60.3	<b>62.8</b>
5. HPW 349 (C)	05	66.2	61.6	62.2	<b>63.3</b>
<b>Mean</b>		<b>65.8</b>	<b>62.7</b>	<b>61.8</b>	<b>63.4</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	65.3	62.1	63.6	<b>63.7</b>
2. HS 277 (C)	12	64.2	60.3	61.5	<b>62.0</b>
3. VL 829 (C)	13	66.3	62.3	64.3	<b>64.3</b>
4. HPW 251 (C)	03	65.8	60.1	62.2	<b>62.7</b>
5. HS 542 (I)	09	65.6	61.2	62.1	<b>63.0</b>
<b>Mean</b>		<b>65.4</b>	<b>61.2</b>	<b>62.7</b>	<b>63.1</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	61.2	64.2	63.1	<b>62.8</b>
2. HS 490 (C)	08	59.6	57.2	60.1	<b>59.0</b>
<b>Mean</b>		<b>60.4</b>	<b>60.7</b>	<b>61.6</b>	<b>60.9</b>

**Table 32: Extraction Rate (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	69.3	67.5	68.1	70.3	70.0	<b>69.0</b>
2. WH 1138	10	70.2	68.5	69.6	68.1	67.3	<b>68.7</b>
3. HUW 666	23	71.2	68.2	69.1	67.6	68.2	<b>68.9</b>
4. DPW 621-50(C)	15	69.1	67.6	70.2	68.1	67.6	<b>68.5</b>
5. HD 2967 (C)	07	69.6	66.2	70.6	67.2	66.6	<b>68.0</b>
6. WH 1105 (C)	20	68.5	67.3	71.2	69.1	68.2	<b>68.9</b>
7. DBW 88 (I)	03	69.2	66.3	70.2	69.1	68.6	<b>68.7</b>
8. HD 3086 (I)	16	68.8	67.3	69.6	70.2	67.2	<b>68.6</b>
<b>Mean</b>		<b>69.5</b>	<b>67.4</b>	<b>69.8</b>	<b>68.7</b>	<b>68.0</b>	<b>68.7</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	70.1	68.2	71.2	72.3	70.3	<b>70.4</b>
2. PBW 590 (C)	10	71.6	67.6	72.1	70.1	70.6	<b>70.4</b>
3. WH 1021 (C)	05	70.6	69.2	71.6	68.1	69.2	<b>69.7</b>
4. HD 3059 (C)	06	72.2	71.3	71.8	70.6	68.3	<b>70.8</b>
5. DBW 90 (I)	09	71.2	70.6	72.2	70.5	71.2	<b>71.1</b>
6. WH 1124 (I)	04	70.5	71.2	72.6	70.8	71.6	<b>71.3</b>
<b>Mean</b>		<b>71.0</b>	<b>69.7</b>	<b>71.9</b>	<b>70.4</b>	<b>70.2</b>	<b>70.6</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	70.3	-	69.2	-	68.3	<b>69.3</b>
2. WH 1080 (C)	04	71.2	-	69.6	-	69.2	<b>70.0</b>
3. PBW 660 (I)	01	71.6	-	70.2	-	69.6	<b>70.5</b>
<b>Mean</b>		<b>71.0</b>	-	<b>69.7</b>	-	<b>69.0</b>	<b>69.9</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	72.1	-	69.1	68.6	67.8	<b>69.4</b>
2. PBW 644 (C)	03	70.5	-	70.1	69.8	69.9	<b>70.1</b>
3. WH 1080 (C)	04	71.6	-	69.2	70.1	70.8	<b>70.4</b>
4. HD 3043 (C)	06	70.6	-	71.2	69.2	70.2	<b>70.3</b>
<b>Mean</b>		<b>71.2</b>	-	<b>69.9</b>	<b>69.4</b>	<b>69.7</b>	<b>70.1</b>

**Table 33: Extraction Rate (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	70.2	72.3	71.3	<b>71.3</b>
2. DBW 39 (C)	08	69.8	70.6	71.2	<b>70.5</b>
3. HD 2733 (C)	05	69.6	70.2	71.4	<b>70.4</b>
4. NW 5054 (I)	06	69.2	68.5	69.8	<b>69.2</b>
5. K 1006 (I)	13	69.8	70.2	69.2	<b>69.7</b>
<b>Mean</b>		<b>69.7</b>	<b>70.4</b>	<b>70.6</b>	<b>70.2</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	68.6	70.2	70.6	<b>69.8</b>
2. DBW 107	03	69.2	70.2	71.2	<b>70.2</b>
3. K 1114	08	68.4	71.6	70.2	<b>70.1</b>
4. NW 2036 (C)	13	70.5	71.4	70.6	<b>70.8</b>
5. DBW 14 (C)	12	68.5	69.2	70.1	<b>69.3</b>
6. HD 2985 (C)	01	69.6	68.5	70.5	<b>69.5</b>
7. HI 1563 (C)	09	71.6	70.5	71.2	<b>71.1</b>
<b>Mean</b>		<b>69.5</b>	<b>70.2</b>	<b>70.6</b>	<b>70.1</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	68.5	70.1	70.5	<b>69.7</b>
2. C 306 (C)	03	71.2	72.5	73.3	<b>72.3</b>
3. K 8027 (C)	05	69.6	70.5	71.6	<b>70.6</b>
4. HD 2888 (C)	04	68.6	70.1	70.6	<b>69.8</b>
<b>Mean</b>		<b>69.5</b>	<b>70.8</b>	<b>71.5</b>	<b>70.6</b>

**Table 34: Extraction Rate (%) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	68.5	66.6	67.5	70.1	69.5	<b>68.4</b>
2. GW 322 (C)	09	67.5	68.2	70.2	67.5	70.4	<b>68.8</b>
3. HI 1544 (C)	10	69.6	68.8	69.2	70.1	70.6	<b>69.7</b>
<b>Mean</b>		<b>68.5</b>	<b>67.9</b>	<b>69.0</b>	<b>69.2</b>	<b>70.2</b>	<b>69.0</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	68.2	69.3	71.2	66.5	70.3	<b>69.1</b>
2. HD 2864 (C)	03	69.6	68.8	70.8	66.0	70.1	<b>69.1</b>
3. HD 2932 (C)	01	69.2	70.1	68.6	68.1	69.6	<b>69.1</b>
4. MP 3336 (C)	04	68.6	69.4	70.2	67.5	70.5	<b>69.2</b>
<b>Mean</b>		<b>68.9</b>	<b>69.4</b>	<b>70.2</b>	<b>67.0</b>	<b>70.1</b>	<b>69.1</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	69.1	69.8	-	-	-	<b>69.5</b>
2. PBW 689	17	67.3	68.2	-	-	-	<b>67.8</b>
3. WH 1142	01	69.6	70.5	-	-	-	<b>70.1</b>
4. HI 1500 (C)	16	69.5	68.8	-	-	-	<b>69.2</b>
5. MP 3288 (C)	15	69.6	71.6	-	-	-	<b>70.6</b>
<b>Mean</b>		<b>69.0</b>	<b>69.8</b>	-	-	-	<b>69.4</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	68.2	67.9	-	-	-	<b>68.1</b>
2. HI 1500 (C)	01	69.8	71.3	-	-	-	<b>70.6</b>
3. MP 3288 (C)	02	68.2	69.3	-	-	-	<b>68.8</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>68.7</b>	<b>69.5</b>	-	-	-	<b>69.1</b>

**Table 35: Extraction Rate (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	68.5	72.2	71.6	<b>70.8</b>
2. MACS 6478 (I)	04	69.2	72.4	70.3	<b>70.6</b>
<b>Mean</b>		<b>68.9</b>	<b>72.3</b>	<b>71.0</b>	<b>70.7</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	69.6	70.8	70.2	<b>70.2</b>
2. Raj 4083 (C)	02	70.3	73.6	71.3	<b>71.7</b>
3. HD 3090 (I)	04	70.0	69.2	71.6	<b>70.3</b>
<b>Mean</b>		<b>70.0</b>	<b>71.2</b>	<b>71.0</b>	<b>70.7</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	69.5	-	<b>69.5</b>
2. NIAW 1994	05	-	69.8	-	<b>69.8</b>
3. NI 5439 (C)	02	-	71.6	-	<b>71.6</b>
4. NIAW 1415 (C)	06	-	70.8	-	<b>70.8</b>
<b>Mean</b>		-	<b>70.4</b>	-	<b>70.4</b>

**Table 36: Extraction Rate (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	70.5	73.5	70.0	72.5	<b>71.6</b>
2. HW 2044 (C)	05	71.8	70.2	69.6	69.8	<b>70.4</b>
3. HW 5216 (C)	02	70.1	71.6	69.1	71.8	<b>70.7</b>
<b>Mean</b>		<b>70.8</b>	<b>71.8</b>	<b>69.6</b>	<b>71.4</b>	<b>70.9</b>

**Table 37: Wet Gluten (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	16.0	17.1	20.1	<b>17.7</b>
2. VL 804 (C)	01	19.9	18.0	26.8	<b>21.6</b>
3. VL 907 (C)	04	25.2	15.3	25.6	<b>22.0</b>
4. HS 507 (C)	03	24.0	18.1	26.0	<b>22.7</b>
5. HPW 349 (C)	05	16.2	17.4	25.1	<b>19.6</b>
<b>Mean</b>		<b>20.3</b>	<b>17.2</b>	<b>24.7</b>	<b>20.7</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	28.1	18.7	19.4	<b>22.1</b>
2. VL 804 (C)	01	26.4	17.8	17.7	<b>20.6</b>
3. VL 907 (C)	04	27.8	14.7	17.8	<b>20.1</b>
4. HS 507 (C)	03	29.3	13.6	19.2	<b>20.7</b>
5. HPW 349 (C)	05	23.1	13.3	16.5	<b>17.6</b>
<b>Mean</b>		<b>26.9</b>	<b>15.6</b>	<b>18.1</b>	<b>20.2</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	25.2	16.0	14.8	<b>18.7</b>
2. HS 277 (C)	12	26.8	16.6	15.1	<b>19.5</b>
3. VL 829 (C)	13	24.2	15.9	18.4	<b>19.5</b>
4. HPW 251 (C)	03	32.7	15.3	16.3	<b>21.4</b>
5. HS 542 (I)	09	26.5	16.6	18.3	<b>20.5</b>
<b>Mean</b>		<b>27.1</b>	<b>16.1</b>	<b>16.6</b>	<b>19.9</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	18.4	23.2	21.7	<b>21.1</b>
2. HS 490 (C)	08	21.3	20.8	13.2	<b>18.4</b>
<b>Mean</b>		<b>19.9</b>	<b>22.0</b>	<b>17.5</b>	<b>19.8</b>

**Table 38: Wet Gluten (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	26.2	28.0	30.3	22.8	25.0	<b>26.5</b>
2. WH 1138	10	25.1	28.1	28.7	25.9	25.7	<b>26.7</b>
3. HUW 666	23	24.1	26.7	34.5	27.9	25.8	<b>27.8</b>
4. DPW 621-50(C)	15	32.6	29.5	32.2	29.4	25.9	<b>29.9</b>
5. HD 2967 (C)	07	23.1	28.9	28.4	24.6	23.9	<b>25.8</b>
6. WH 1105 (C)	20	24.0	27.0	29.6	26.9	25.1	<b>26.5</b>
7. DBW 88 (I)	03	25.1	27.4	33.0	25.5	24.0	<b>27.0</b>
8. HD 3086 (I)	16	29.4	26.8	30.5	28.7	23.7	<b>27.8</b>
<b>Mean</b>		<b>26.2</b>	<b>27.8</b>	<b>30.9</b>	<b>26.5</b>	<b>24.9</b>	<b>27.3</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	24.4	24.7	34.6	29.4	24.4	<b>27.5</b>
2. PBW 590 (C)	10	23.1	30.0	29.8	24.4	25.4	<b>26.5</b>
3. WH 1021 (C)	05	26.3	35.9	34.9	27.4	28.2	<b>30.5</b>
4. HD 3059 (C)	06	28.0	32.1	33.0	25.7	29.7	<b>29.7</b>
5. DBW 90 (I)	09	28.2	28.8	29.5	26.5	23.2	<b>27.2</b>
6. WH 1124 (I)	04	26.8	33.3	30.8	26.0	25.8	<b>28.5</b>
<b>Mean</b>		<b>26.1</b>	<b>30.8</b>	<b>32.1</b>	<b>26.6</b>	<b>26.1</b>	<b>28.3</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	31.0	-	38.0	-	21.4	<b>30.1</b>
2. WH 1080 (C)	04	30.3	-	34.2	-	22.9	<b>29.1</b>
3. PBW 660 (I)	01	31.7	-	35.3	-	24.5	<b>30.5</b>
<b>Mean</b>		<b>31.0</b>	-	<b>35.8</b>	-	<b>22.9</b>	<b>29.9</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	28.0	-	35.0	22.2	23.5	<b>27.2</b>
2. PBW 644 (C)	03	30.1	-	38.0	22.4	21.6	<b>28.0</b>
3. WH 1080 (C)	04	27.8	-	34.7	19.5	26.3	<b>27.1</b>
4. HD 3043 (C)	06	31.2	-	36.3	21.0	20.0	<b>27.1</b>
<b>Mean</b>		<b>29.3</b>	-	<b>36.0</b>	<b>21.3</b>	<b>22.9</b>	<b>27.4</b>



**Table 39: Wet Gluten (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	23.2	28.2	27.8	<b>26.4</b>
2. DBW 39 (C)	08	21.8	28.0	26.3	<b>25.4</b>
3. HD 2733 (C)	05	23.4	28.4	26.8	<b>26.2</b>
4. NW 5054 (I)	06	23.1	32.5	26.9	<b>27.5</b>
5. K 1006 (I)	13	23.6	32.7	28.7	<b>28.3</b>
<b>Mean</b>		<b>23.0</b>	<b>30.0</b>	<b>27.3</b>	<b>26.8</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	27.6	32.4	29.3	<b>29.8</b>
2. DBW 107	03	30.8	31.9	29.3	<b>30.7</b>
3. K 1114	08	24.5	28.9	26.2	<b>26.5</b>
4. NW 2036 (C)	13	27.4	30.4	24.4	<b>27.4</b>
5. DBW 14 (C)	12	27.4	31.8	30.2	<b>29.8</b>
6. HD 2985 (C)	01	27.4	30.2	25.4	<b>27.7</b>
7. HI 1563 (C)	09	25.6	31.4	25.3	<b>27.4</b>
<b>Mean</b>		<b>27.2</b>	<b>31.0</b>	<b>27.2</b>	<b>28.5</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	18.4	28.6	23.0	<b>23.3</b>
2. C 306 (C)	03	22.7	36.5	24.8	<b>28.0</b>
3. K 8027 (C)	05	27.3	36.3	24.6	<b>29.4</b>
4. HD 2888 (C)	04	21.4	36.8	23.9	<b>27.4</b>
<b>Mean</b>		<b>22.5</b>	<b>34.6</b>	<b>24.1</b>	<b>27.0</b>

**Table 40: Wet Gluten (%) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	31.3	41.6	33.5	29.3	32.5	<b>33.6</b>
2. GW 322 (C)	09	20.4	31.7	30.1	28.6	24.5	<b>27.1</b>
3. HI 1544 (C)	10	29.3	39.2	33.0	31.5	27.7	<b>32.1</b>
<b>Mean</b>		<b>27.0</b>	<b>37.5</b>	<b>32.2</b>	<b>29.8</b>	<b>28.2</b>	<b>30.9</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	27.9	34.7	30.4	32.9	34.0	<b>32.0</b>
2. HD 2864 (C)	03	26.9	33.3	29.9	29.2	32.3	<b>30.3</b>
3. HD 2932 (C)	01	26.9	34.6	35.4	30.4	35.3	<b>32.5</b>
4. MP 3336 (C)	04	28.0	39.5	38.0	37.7	33.4	<b>35.3</b>
<b>Mean</b>		<b>27.4</b>	<b>35.5</b>	<b>33.4</b>	<b>32.6</b>	<b>33.8</b>	<b>32.5</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	37.1	24.6	-	-	-	<b>30.9</b>
2. PBW 689	17	39.1	25.2	-	-	-	<b>32.2</b>
3. WH 1142	01	26.7	19.2	-	-	-	<b>23.0</b>
4. HI 1500 (C)	16	37.7	25.3	-	-	-	<b>31.5</b>
5. MP 3288 (C)	15	32.5	24.2	-	-	-	<b>28.4</b>
<b>Mean</b>		<b>34.6</b>	<b>23.7</b>	-	-	-	<b>29.2</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	28.4	30.5	-	-	-	<b>29.5</b>
2. HI 1500 (C)	01	26.7	26.3	-	-	-	<b>26.5</b>
3. MP 3288 (C)	02	24.8	35.6	-	-	-	<b>30.2</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>26.6</b>	<b>30.8</b>	-	-	-	<b>28.7</b>

**Table 41: Wet Gluten (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	34.4	39.8	33.7	<b>36.0</b>
2. MACS 6478 (I)	04	32.7	37.3	35.3	<b>35.1</b>
<b>Mean</b>		<b>33.6</b>	<b>38.6</b>	<b>34.5</b>	<b>35.5</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	33.6	33.2	36.9	<b>34.6</b>
2. Raj 4083 (C)	02	29.3	30.5	33.0	<b>30.9</b>
3. HD 3090 (I)	04	30.7	30.2	34.6	<b>31.8</b>
<b>Mean</b>		<b>31.2</b>	<b>31.3</b>	<b>34.8</b>	<b>32.4</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	29.5	-	<b>29.5</b>
2. NIAW 1994	05	-	27.0	-	<b>27.0</b>
3. NI 5439 (C)	02	-	29.0	-	<b>29.0</b>
4. NIAW 1415 (C)	06	-	34.5	-	<b>34.5</b>
<b>Mean</b>		-	<b>30.0</b>	-	<b>30.0</b>

**Table 42: Wet Gluten (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	28.6	26.5	38.5	26.5	<b>30.0</b>
2. HW 2044 (C)	05	26.5	30.2	28.6	31.3	<b>29.2</b>
3. HW 5216 (C)	02	27.1	31.3	39.5	30.6	<b>32.1</b>
<b>Mean</b>		<b>27.4</b>	<b>29.3</b>	<b>35.5</b>	<b>29.5</b>	<b>30.4</b>

**Table 43: Dry Gluten (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	5.9	5.5	6.7	<b>6.0</b>
2. VL 804 (C)	01	6.7	6.0	9.0	<b>7.2</b>
3. VL 907 (C)	04	7.8	6.9	8.1	<b>7.6</b>
4. HS 507 (C)	03	7.4	6.0	8.1	<b>7.2</b>
5. HPW 349 (C)	05	6.4	6.7	8.5	<b>7.2</b>
<b>Mean</b>		<b>6.8</b>	<b>6.2</b>	<b>8.1</b>	<b>7.0</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	8.3	6.0	6.2	<b>6.8</b>
2. VL 804 (C)	01	8.6	6.6	6.2	<b>7.1</b>
3. VL 907 (C)	04	8.9	6.5	6.9	<b>7.4</b>
4. HS 507 (C)	03	9.1	6.1	6.3	<b>7.2</b>
5. HPW 349 (C)	05	7.6	6.2	6.2	<b>6.7</b>
<b>Mean</b>		<b>8.5</b>	<b>6.3</b>	<b>6.4</b>	<b>7.0</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	8.1	5.3	6.1	<b>6.5</b>
2. HS 277 (C)	12	8.7	6.3	6.1	<b>7.0</b>
3. VL 829 (C)	13	7.3	6.3	6.2	<b>6.6</b>
4. HPW 251 (C)	03	10.3	6.3	5.6	<b>7.4</b>
5. HS 542 (I)	09	8.5	6.3	5.6	<b>6.8</b>
<b>Mean</b>		<b>8.6</b>	<b>6.1</b>	<b>5.9</b>	<b>6.9</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	6.5	7.7	7.3	<b>7.2</b>
2. HS 490 (C)	08	6.7	6.9	6.3	<b>6.6</b>
<b>Mean</b>		<b>6.6</b>	<b>7.3</b>	<b>6.8</b>	<b>6.9</b>

**Table 44: Dry Gluten (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	8.5	9.5	10.2	8.7	8.6	<b>9.1</b>
2. WH 1138	10	8.7	9.4	9.9	8.9	8.6	<b>9.1</b>
3. HUW 666	23	7.9	9.5	11.4	9.6	8.6	<b>9.4</b>
4. DPW 621-50(C)	15	8.8	10.4	9.2	9.8	8.6	<b>9.4</b>
5. HD 2967 (C)	07	7.8	9.6	10.8	8.3	7.5	<b>8.8</b>
6. WH 1105 (C)	20	8.2	9.4	10.1	9.4	7.7	<b>9.0</b>
7. DBW 88 (I)	03	8.5	9.6	11.4	8.7	7.8	<b>9.2</b>
8. HD 3086 (I)	16	9.8	9.0	10.8	9.4	8.2	<b>9.4</b>
<b>Mean</b>		<b>8.5</b>	<b>9.6</b>	<b>10.5</b>	<b>9.1</b>	<b>8.2</b>	<b>9.2</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	8.2	10.7	11.4	9.3	7.9	<b>9.5</b>
2. PBW 590 (C)	10	7.9	11.0	9.7	8.2	8.5	<b>9.1</b>
3. WH 1021 (C)	05	9.0	11.5	10.8	8.9	8.3	<b>9.7</b>
4. HD 3059 (C)	06	9.0	10.7	11.1	8.6	10.6	<b>10.0</b>
5. DBW 90 (I)	09	9.1	10.6	10.3	8.6	7.9	<b>9.3</b>
6. WH 1124 (I)	04	8.6	10.5	10.6	8.7	8.8	<b>9.4</b>
<b>Mean</b>		<b>8.6</b>	<b>10.8</b>	<b>10.7</b>	<b>8.7</b>	<b>8.7</b>	<b>9.5</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	9.7	-	13.0	-	7.1	<b>9.9</b>
2. WH 1080 (C)	04	9.3	-	11.9	-	7.5	<b>9.6</b>
3. PBW 660 (I)	01	10.8	-	11.2	-	8.2	<b>10.1</b>
<b>Mean</b>		<b>9.9</b>	-	<b>12.0</b>	-	<b>7.6</b>	<b>9.9</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	9.8	-	11.1	7.5	7.4	<b>9.0</b>
2. PBW 644 (C)	03	9.5	-	11.9	7.4	7.2	<b>9.0</b>
3. WH 1080 (C)	04	9.1	-	10.9	6.7	9.0	<b>8.9</b>
4. HD 3043 (C)	06	9.8	-	11.1	6.9	6.9	<b>8.7</b>
<b>Mean</b>		<b>9.6</b>	-	<b>11.3</b>	<b>7.1</b>	<b>7.6</b>	<b>8.9</b>

**Table 45: Dry Gluten (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	7.9	11.8	8.8	<b>9.5</b>
2. DBW 39 (C)	08	7.2	10.0	7.0	<b>8.1</b>
3. HD 2733 (C)	05	7.3	10.5	8.5	<b>8.8</b>
4. NW 5054 (I)	06	7.6	11.0	8.6	<b>9.1</b>
5. K 1006 (I)	13	7.6	11.1	9.1	<b>9.3</b>
<b>Mean</b>		<b>7.5</b>	<b>10.9</b>	<b>8.4</b>	<b>8.9</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	9.3	10.5	9.3	<b>9.7</b>
2. DBW 107	03	9.5	9.9	9.3	<b>9.6</b>
3. K 1114	08	8.0	9.3	8.4	<b>8.6</b>
4. NW 2036 (C)	13	8.7	9.8	7.9	<b>8.8</b>
5. DBW 14 (C)	12	8.7	10.1	9.2	<b>9.3</b>
6. HD 2985 (C)	01	8.4	9.7	8.4	<b>8.8</b>
7. HI 1563 (C)	09	9.6	10.2	8.4	<b>9.4</b>
<b>Mean</b>		<b>8.9</b>	<b>9.9</b>	<b>8.7</b>	<b>9.2</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	6.3	9.6	7.4	<b>7.8</b>
2. C 306 (C)	03	8.1	10.4	7.8	<b>8.8</b>
3. K 8027 (C)	05	9.6	11.8	7.6	<b>9.7</b>
4. HD 2888 (C)	04	7.7	10.2	7.8	<b>8.6</b>
<b>Mean</b>		<b>7.9</b>	<b>10.5</b>	<b>7.7</b>	<b>8.7</b>

**Table 46: Dry Gluten (%) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	9.8	11.6	10.7	10.2	10.9	<b>10.6</b>
2. GW 322 (C)	09	6.8	10.5	10.8	9.6	7.6	<b>9.1</b>
3. HI 1544 (C)	10	7.3	11.0	11.4	10.0	8.8	<b>9.7</b>
<b>Mean</b>		<b>8.0</b>	<b>11.0</b>	<b>11.0</b>	<b>9.9</b>	<b>9.1</b>	<b>9.8</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	8.0	10.7	9.4	10.8	10.4	<b>9.9</b>
2. HD 2864 (C)	03	8.7	10.1	9.5	9.1	10.1	<b>9.5</b>
3. HD 2932 (C)	01	8.6	10.5	10.9	9.2	11.1	<b>10.1</b>
4. MP 3336 (C)	04	9.5	11.1	11.4	11.5	10.5	<b>10.8</b>
<b>Mean</b>		<b>8.7</b>	<b>10.6</b>	<b>10.3</b>	<b>10.2</b>	<b>10.5</b>	<b>10.1</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	12.9	8.4	-	-	-	<b>10.7</b>
2. PBW 689	17	12.8	8.8	-	-	-	<b>10.8</b>
3. WH 1142	01	9.7	6.6	-	-	-	<b>8.2</b>
4. HI 1500 (C)	16	12.5	8.1	-	-	-	<b>10.3</b>
5. MP 3288 (C)	15	10.2	7.8	-	-	-	<b>9.0</b>
<b>Mean</b>		<b>11.6</b>	<b>7.9</b>	-	-	-	<b>9.8</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	8.7	9.8	-	-	-	<b>9.3</b>
2. HI 1500 (C)	01	8.7	10.6	-	-	-	<b>9.7</b>
3. MP 3288 (C)	02	8.3	11.2	-	-	-	<b>9.8</b>
4. HI 8627 (C) (d)	04	-	-	-	-	-	-
<b>Mean</b>		<b>8.6</b>	<b>10.5</b>	-	-	-	<b>9.6</b>

**Table 47: Dry Gluten (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	11.4	11.4	10.1	<b>11.0</b>
2. MACS 6478 (I)	04	9.8	11.3	11.8	<b>11.0</b>
<b>Mean</b>		<b>10.6</b>	<b>11.4</b>	<b>11.0</b>	<b>11.0</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	10.5	10.3	11.3	<b>10.7</b>
2. Raj 4083 (C)	02	9.2	9.8	10.3	<b>9.8</b>
3. HD 3090 (I)	04	9.7	9.4	10.4	<b>9.8</b>
<b>Mean</b>		<b>9.8</b>	<b>9.8</b>	<b>10.7</b>	<b>10.1</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	9.5	-	<b>9.5</b>
2. NIAW 1994	05	-	8.5	-	<b>8.5</b>
3. NI 5439 (C)	02	-	9.6	-	<b>9.6</b>
4. NIAW 1415 (C)	06	-	11.0	-	<b>11.0</b>
<b>Mean</b>		-	<b>9.7</b>	-	<b>9.7</b>

**Table 48: Dry Gluten (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	9.7	8.8	11.6	8.9	<b>9.8</b>
2. HW 2044 (C)	05	9.5	10.2	9.9	10.2	<b>10.0</b>
3. HW 5216 (C)	02	9.3	10.4	11.8	9.9	<b>10.4</b>
<b>Mean</b>		<b>9.5</b>	<b>9.8</b>	<b>11.1</b>	<b>9.7</b>	<b>10.0</b>

**Table 49: Gluten Index (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	84	79	82	<b>82</b>
2. VL 804 (C)	01	80	64	61	<b>68</b>
3. VL 907 (C)	04	40	64	43	<b>49</b>
4. HS 507 (C)	03	52	70	56	<b>59</b>
5. HPW 349 (C)	05	89	85	79	<b>84</b>
<b>Mean</b>		<b>69</b>	<b>72</b>	<b>64</b>	<b>69</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	64	78	71	<b>71</b>
2. VL 804 (C)	01	64	62	80	<b>69</b>
3. VL 907 (C)	04	54	58	67	<b>60</b>
4. HS 507 (C)	03	54	65	80	<b>66</b>
5. HPW 349 (C)	05	83	81	81	<b>82</b>
<b>Mean</b>		<b>64</b>	<b>69</b>	<b>76</b>	<b>69</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	84	77	80	<b>80</b>
2. HS 277 (C)	12	58	81	72	<b>70</b>
3. VL 829 (C)	13	63	49	57	<b>56</b>
4. HPW 251 (C)	03	55	49	83	<b>62</b>
5. HS 542 (I)	09	79	54	53	<b>62</b>
<b>Mean</b>		<b>68</b>	<b>62</b>	<b>69</b>	<b>66</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	45	52	64	<b>54</b>
2. HS 490 (C)	08	55	44	68	<b>56</b>
<b>Mean</b>		<b>50</b>	<b>48</b>	<b>66</b>	<b>55</b>

**Table 50: Gluten Index (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	71	85	81	80	83	<b>80</b>
2. WH 1138	10	76	83	85	86	61	<b>78</b>
3. HUW 666	23	74	85	72	79	82	<b>78</b>
4. DPW 621-50(C)	15	76	80	75	89	65	<b>77</b>
5. HD 2967 (C)	07	64	67	60	65	71	<b>65</b>
6. WH 1105 (C)	20	78	74	83	77	78	<b>78</b>
7. DBW 88 (I)	03	75	81	83	89	76	<b>81</b>
8. HD 3086 (I)	16	74	84	74	73	75	<b>76</b>
<b>Mean</b>		<b>74</b>	<b>80</b>	<b>77</b>	<b>80</b>	<b>74</b>	<b>77</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	79	84	64	54	61	<b>68</b>
2. PBW 590 (C)	10	71	75	70	80	51	<b>69</b>
3. WH 1021 (C)	05	59	46	52	61	42	<b>52</b>
4. HD 3059 (C)	06	80	64	87	68	83	<b>76</b>
5. DBW 90 (I)	09	79	74	70	82	81	<b>77</b>
6. WH 1124 (I)	04	59	53	83	76	68	<b>68</b>
<b>Mean</b>		<b>71</b>	<b>66</b>	<b>71</b>	<b>70</b>	<b>64</b>	<b>69</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	48	-	44	-	64	<b>52</b>
2. WH 1080 (C)	04	51	-	65	-	87	<b>68</b>
3. PBW 660 (I)	01	66	-	43	-	52	<b>54</b>
<b>Mean</b>		<b>55</b>	-	<b>51</b>	-	<b>68</b>	<b>58</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	68	-	50	72	43	<b>58</b>
2. PBW 644 (C)	03	40	-	43	64	43	<b>48</b>
3. WH 1080 (C)	04	64	-	55	78	69	<b>67</b>
4. HD 3043 (C)	06	49	-	51	79	73	<b>63</b>
<b>Mean</b>		<b>55</b>	-	<b>50</b>	<b>73</b>	<b>57</b>	<b>61</b>

**Table 51: Gluten Index (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	41	58	49	<b>49</b>
2. DBW 39 (C)	08	55	60	74	<b>63</b>
3. HD 2733 (C)	05	49	57	61	<b>56</b>
4. NW 5054 (I)	06	50	49	56	<b>52</b>
5. K 1006 (I)	13	35	44	52	<b>44</b>
<b>Mean</b>		<b>46</b>	<b>54</b>	<b>58</b>	<b>53</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	52	53	65	<b>57</b>
2. DBW 107	03	40	44	52	<b>45</b>
3. K 1114	08	68	56	85	<b>70</b>
4. NW 2036 (C)	13	72	59	85	<b>72</b>
5. DBW 14 (C)	12	71	55	42	<b>56</b>
6. HD 2985 (C)	01	64	58	71	<b>64</b>
7. HI 1563 (C)	09	61	72	57	<b>63</b>
<b>Mean</b>		<b>61</b>	<b>57</b>	<b>65</b>	<b>61</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	52	62	72	<b>62</b>
2. C 306 (C)	03	51	40	65	<b>52</b>
3. K 8027 (C)	05	48	43	58	<b>50</b>
4. HD 2888 (C)	04	69	40	60	<b>56</b>
<b>Mean</b>		<b>55</b>	<b>46</b>	<b>64</b>	<b>55</b>

**Table 52: Gluten Index (%) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	56	53	54	61	59	<b>57</b>
2. GW 322 (C)	09	53	47	40	48	49	<b>47</b>
3. HI 1544 (C)	10	63	43	53	54	43	<b>51</b>
		<b>57</b>	<b>48</b>	<b>49</b>	<b>54</b>	<b>50</b>	<b>52</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	40	56	46	56	53	<b>50</b>
2. HD 2864 (C)	03	61	52	64	68	74	<b>64</b>
3. HD 2932 (C)	01	59	43	48	43	58	<b>50</b>
4. MP 3336 (C)	04	46	45	46	43	60	<b>48</b>
<b>Mean</b>		<b>52</b>	<b>49</b>	<b>51</b>	<b>53</b>	<b>61</b>	<b>53</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	42	48	-	-	-	<b>45</b>
2. PBW 689	17	61	68	-	-	-	<b>65</b>
3. WH 1142	01	56	64	-	-	-	<b>60</b>
4. HI 1500 (C)	16	53	58	-	-	-	<b>56</b>
5. MP 3288 (C)	15	74	66	-	-	-	<b>70</b>
<b>Mean</b>		<b>57</b>	<b>61</b>	-	-	-	<b>59</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	66	54	-	-	-	<b>60</b>
2. HI 1500 (C)	01	53	51	-	-	-	<b>52</b>
3. MP 3288 (C)	02	65	61	-	-	-	<b>63</b>
4. HI 8627 (C) (d)	04	44	39	-	-	-	<b>42</b>
<b>Mean</b>		<b>57</b>	<b>51</b>	-	-	-	<b>54</b>

**Table 53: Gluten Index (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	44	54	37	<b>45</b>
2. MACS 6478 (I)	04	44	51	53	<b>49</b>
<b>Mean</b>		<b>44</b>	<b>53</b>	<b>45</b>	<b>47</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	59	71	47	<b>59</b>
2. Raj 4083 (C)	02	62	71	56	<b>63</b>
3. HD 3090 (I)	04	56	70	51	<b>59</b>
<b>Mean</b>		<b>59</b>	<b>71</b>	<b>51</b>	<b>60</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	64	-	<b>64</b>
2. NIAW 1994	05	-	49	-	<b>49</b>
3. NI 5439 (C)	02	-	70	-	<b>70</b>
4. NIAW 1415 (C)	06	-	58	-	<b>58</b>
<b>Mean</b>		-	<b>60</b>	-	<b>60</b>

**Table 54: Gluten Index (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	46	43	57	63	<b>52</b>
2. HW 2044 (C)	05	47	63	71	66	<b>62</b>
3. HW 5216 (C)	02	43	48	59	65	<b>54</b>
<b>Mean</b>		<b>45</b>	<b>51</b>	<b>62</b>	<b>65</b>	<b>56</b>



### **Biscuit Quality (Table 55 – 66)**

More than three hundred samples of AVT (2<sup>nd</sup> year) and checks representing different locations were evaluated for biscuit making quality. The data is presented in table 55-66 for biscuit diameter and spread factor. The samples of AVT (II<sup>nd</sup> year and checks) were evaluated from all centres from each zone representing all the conditions as ITS, ILS, RILS and RTS. Baking test was conducted from pooled samples of all the replications of a condition and two parameters as biscuit diameter and spread factor were recorded. The flour was extracted from all the entries using Quadrumet Senior Mill with the average extraction rate of ~70%.

Varieties from RILS conditions from NHZ exhibited higher spread factor (average 10.11) as compared to other conditions in the zone as exhibited earlier years also. The highest average spread factor was exhibited by HS490 (RILS, NHZ) (>11.77). This also exhibited lower SKCS Hardness Index indicating its higher potential towards biscuit making. Besides HS490, there was no variety in the trial with soft grain texture and high spread factor (>9.0). In NWPZ, higher spread factor was observed in ILS conditions with the average value of 7.82 and the highest average value was recorded in Pantnagar (7.82). There was higher spread in entries under ITS conditions in NEPZ with the average value of 8.56. Overall, like previous year, only one variety (HS490) showed soft grain characteristics and higher spread factor, hence there is need to incorporate soft grain characteristics in entries belonging to other zones to improve biscuit making quality.

**Table 55: Biscuit Diameter (cm) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	8.15	7.80	7.90	<b>7.95</b>
2. VL 804 (C)	01	7.83	7.48	7.80	<b>7.70</b>
3. VL 907 (C)	04	8.20	7.83	8.18	<b>8.07</b>
4. HS 507 (C)	03	7.75	7.60	7.88	<b>7.74</b>
5. HPW 349 (C)	05	8.18	8.25	7.85	<b>8.09</b>
<b>Mean</b>		<b>8.02</b>	<b>7.79</b>	<b>7.92</b>	<b>7.91</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	7.70	7.98	8.13	<b>7.93</b>
2. VL 804 (C)	01	7.48	7.50	7.65	<b>7.54</b>
3. VL 907 (C)	04	8.28	7.98	7.83	<b>8.03</b>
4. HS 507 (C)	03	7.55	7.70	7.93	<b>7.73</b>
5. HPW 349 (C)	05	7.85	8.13	8.05	<b>8.01</b>
<b>Mean</b>		<b>7.77</b>	<b>7.86</b>	<b>7.92</b>	<b>7.85</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	7.60	7.85	7.73	<b>7.73</b>
2. HS 277 (C)	12	7.65	8.10	8.03	<b>7.93</b>
3. VL 829 (C)	13	7.88	7.83	7.45	<b>7.72</b>
4. HPW 251 (C)	03	7.45	7.78	7.88	<b>7.70</b>
5. HS 542 (I)	09	7.95	7.85	8.05	<b>7.95</b>
<b>Mean</b>		<b>7.71</b>	<b>7.88</b>	<b>7.83</b>	<b>7.80</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	8.13	7.83	7.60	<b>7.85</b>
2. HS 490 (C)	08	8.55	8.65	8.50	<b>8.57</b>
<b>Mean</b>		<b>8.34</b>	<b>8.24</b>	<b>8.05</b>	<b>8.21</b>

**Table 56: Biscuit Diameter (cm) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	7.45	7.05	7.35	7.38	7.38	<b>7.32</b>
2. WH 1138	10	7.70	7.45	7.40	7.98	7.85	<b>7.68</b>
3. HUW 666	23	7.25	7.23	7.50	7.85	7.75	<b>7.52</b>
4. DPW 621-50(C)	15	7.43	7.43	7.40	7.85	7.80	<b>7.58</b>
5. HD 2967 (C)	07	7.60	7.68	7.68	7.18	7.93	<b>7.61</b>
6. WH 1105 (C)	20	7.63	7.45	7.70	8.05	7.78	<b>7.72</b>
7. DBW 88 (I)	03	7.53	7.33	7.50	7.50	7.68	<b>7.51</b>
8. HD 3086 (I)	16	7.85	7.38	8.05	7.98	7.55	<b>7.76</b>
<b>Mean</b>		<b>7.55</b>	<b>7.37</b>	<b>7.57</b>	<b>7.72</b>	<b>7.71</b>	<b>7.59</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	7.65	7.33	7.63	8.05	7.80	<b>7.69</b>
2. PBW 590 (C)	10	7.63	7.75	7.55	8.10	7.65	<b>7.74</b>
3. WH 1021 (C)	05	7.78	7.28	7.65	8.15	8.00	<b>7.77</b>
4. HD 3059 (C)	06	7.63	7.65	7.58	7.85	7.75	<b>7.69</b>
5. DBW 90 (I)	09	7.25	7.70	7.70	7.70	7.73	<b>7.62</b>
6. WH 1124 (I)	04	7.38	7.90	7.70	7.98	7.95	<b>7.78</b>
<b>Mean</b>		<b>7.55</b>	<b>7.60</b>	<b>7.63</b>	<b>7.97</b>	<b>7.81</b>	<b>7.71</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	7.55	-	7.08	-	7.70	<b>7.44</b>
2. WH 1080 (C)	04	7.50	-	7.33	-	7.88	<b>7.57</b>
3. PBW 660 (I)	01	7.50	-	7.63	-	7.75	<b>7.63</b>
<b>Mean</b>		<b>7.52</b>	-	<b>7.34</b>	-	<b>7.78</b>	<b>7.54</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	7.50	-	7.15	7.93	8.00	<b>7.64</b>
2. PBW 644 (C)	03	7.43	-	7.50	7.63	7.88	<b>7.61</b>
3. WH 1080 (C)	04	7.35	-	7.55	8.05	7.80	<b>7.69</b>
4. HD 3043 (C)	06	7.50	-	7.18	7.83	7.85	<b>7.59</b>
<b>Mean</b>		<b>7.44</b>	-	<b>7.34</b>	<b>7.86</b>	<b>7.88</b>	<b>7.63</b>

**Table 57: Biscuit Diameter (cm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	7.88	7.70	7.93	<b>7.83</b>
2. DBW 39 (C)	08	7.85	7.93	8.03	<b>7.93</b>
3. HD 2733 (C)	05	7.98	8.15	7.98	<b>8.03</b>
4. NW 5054 (I)	06	8.03	7.83	8.10	<b>7.98</b>
5. K 1006 (I)	13	7.95	7.95	8.03	<b>7.98</b>
<b>Mean</b>		<b>7.94</b>	<b>7.91</b>	<b>8.01</b>	<b>7.95</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	7.88	7.73	7.83	<b>7.81</b>
2. DBW 107	03	7.95	7.93	7.88	<b>7.92</b>
3. K 1114	08	7.93	7.75	7.65	<b>7.78</b>
4. NW 2036 (C)	13	8.25	7.88	8.25	<b>8.13</b>
5. DBW 14 (C)	12	7.88	7.93	7.93	<b>7.91</b>
6. HD 2985 (C)	01	8.03	7.65	7.95	<b>7.88</b>
7. HI 1563 (C)	09	7.88	7.75	7.50	<b>7.71</b>
<b>Mean</b>		<b>7.97</b>	<b>7.80</b>	<b>7.85</b>	<b>7.87</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	7.90	7.63	7.85	<b>7.79</b>
2. C 306 (C)	03	8.05	7.53		<b>7.79</b>
3. K 8027 (C)	05	7.88	7.50	7.80	<b>7.73</b>
4. HD 2888 (C)	04	7.30	7.40	8.30	<b>7.67</b>
<b>Mean</b>		<b>7.78</b>	<b>7.51</b>	<b>7.98</b>	<b>7.76</b>

**Table 58: Biscuit Diameter (cm) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	7.73	7.55	7.58	7.45	7.65	<b>7.59</b>
2. GW 322 (C)	09	7.60	7.68	7.40	7.73	7.75	<b>7.63</b>
3. HI 1544 (C)	10	7.53	7.50	-	7.30	7.10	<b>7.36</b>
<b>Mean</b>		<b>7.62</b>	<b>7.58</b>	<b>7.49</b>	<b>7.49</b>	<b>7.50</b>	<b>7.53</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	7.43	7.15	7.48	7.53	7.43	<b>7.40</b>
2. HD 2864 (C)	03	7.45	7.55	7.80	7.38	7.75	<b>7.59</b>
3. HD 2932 (C)	01	7.90	7.95	8.13	7.43	7.50	<b>7.78</b>
4. MP 3336 (C)	04	7.55	7.63	7.30		7.50	<b>7.49</b>
<b>Mean</b>		<b>7.58</b>	<b>7.57</b>	<b>7.68</b>	<b>7.44</b>	<b>7.54</b>	<b>7.56</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	7.68	7.20	-	-	-	<b>7.44</b>
2. PBW 689	17	7.35	7.90	-	-	-	<b>7.63</b>
3. WH 1142	01	7.65	7.78	-	-	-	<b>7.71</b>
4. HI 1500 (C)	16	7.35	7.45	-	-	-	<b>7.40</b>
5. MP 3288 (C)	15	7.03	7.78	-	-	-	<b>7.40</b>
<b>Mean</b>		<b>7.41</b>	<b>7.62</b>	-	-	-	<b>7.52</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	7.40	6.95	-	-	-	<b>7.18</b>
2. HI 1500 (C)	01	7.35	6.95	-	-	-	<b>7.15</b>
3. MP 3288 (C)	02	7.28	7.20	-	-	-	<b>7.24</b>
4. HI 8627 (C) (d)	04	7.40		-	-	-	<b>7.40</b>
<b>Mean</b>		<b>7.36</b>	<b>7.03</b>	-	-	-	<b>7.19</b>

**Table 59: Biscuit Diameter (cm) of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	7.15	7.60	7.10	<b>7.28</b>
2. MACS 6478 (I)	04	7.05	7.33	7.18	<b>7.18</b>
<b>Mean</b>		<b>7.10</b>	<b>7.46</b>	<b>7.14</b>	<b>7.23</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	7.18	7.38	7.35	<b>7.30</b>
2. Raj 4083 (C)	02	7.03	7.13	7.13	<b>7.09</b>
3. HD 3090 (I)	04	7.50	7.85	7.53	<b>7.63</b>
<b>Mean</b>		<b>7.23</b>	<b>7.45</b>	<b>7.33</b>	<b>7.34</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	7.73	-	<b>7.73</b>
2. NIAW 1994	05	-	7.50	-	<b>7.50</b>
3. NI 5439 (C)	02	-	7.83	-	<b>7.83</b>
4. NIAW 1415 (C)	06	-	7.50	-	<b>7.50</b>
<b>Mean</b>		-	<b>7.64</b>	-	<b>7.64</b>

**Table 60: Biscuit Diameter (cm) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	7.40	-	-	-	7.40
2. HW 2044 (C)	05	7.38	-	-	-	7.38
3. HW 5216 (C)	02	7.15	-	-	-	7.15
<b>Mean</b>		<b>7.31</b>	-	-	-	<b>7.31</b>

**Table 61: Biscuit Spread Factor of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	8.93	8.79	8.66	<b>8.79</b>
2. VL 804 (C)	01	8.24	7.20	8.43	<b>7.96</b>
3. VL 907 (C)	04	9.24	8.58	9.91	<b>9.24</b>
4. HS 507 (C)	03	8.05	7.90	8.18	<b>8.04</b>
5. HPW 349 (C)	05	9.48	9.43	8.85	<b>9.25</b>
<b>Mean</b>		<b>8.79</b>	<b>8.38</b>	<b>8.81</b>	<b>8.66</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	8.00	8.62	9.29	<b>8.64</b>
2. VL 804 (C)	01	7.57	7.14	7.95	<b>7.55</b>
3. VL 907 (C)	04	8.83	8.99	8.13	<b>8.65</b>
4. HS 507 (C)	03	7.37	7.70	8.68	<b>7.92</b>
5. HPW 349 (C)	05	8.72	8.78	9.47	<b>8.99</b>
<b>Mean</b>		<b>8.10</b>	<b>8.25</b>	<b>8.70</b>	<b>8.35</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	8.11	8.72	8.24	<b>8.36</b>
2. HS 277 (C)	12	8.38	8.76	9.73	<b>8.96</b>
3. VL 829 (C)	13	8.63	8.03	7.84	<b>8.17</b>
4. HPW 251 (C)	03	7.64	7.97	8.40	<b>8.01</b>
5. HS 542 (I)	09	8.83	8.67	9.07	<b>8.86</b>
<b>Mean</b>		<b>8.32</b>	<b>8.43</b>	<b>8.66</b>	<b>8.47</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	9.29	8.13	7.90	<b>8.44</b>
2. HS 490 (C)	08	11.59	12.58	11.15	<b>11.77</b>
<b>Mean</b>		<b>10.44</b>	<b>10.36</b>	<b>9.52</b>	<b>10.11</b>

**Table 62: Biscuit Spread Factor of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	6.70	6.20	6.53	6.56	7.02	<b>6.60</b>
2. WH 1138	10	7.00	6.85	6.65	8.62	7.95	<b>7.41</b>
3. HUW 666	23	6.82	6.49	7.32	8.16	7.85	<b>7.33</b>
4. DPW 621-50(C)	15	7.33	7.43	6.80	8.72	8.10	<b>7.68</b>
5. HD 2967 (C)	07	7.90	7.77	7.31	6.38	8.13	<b>7.50</b>
6. WH 1105 (C)	20	7.92	7.27	7.60	9.07	7.59	<b>7.89</b>
7. DBW 88 (I)	03	7.43	7.15	6.98	7.23	7.87	<b>7.33</b>
8. HD 3086 (I)	16	8.26	6.70	8.94	8.86	7.28	<b>8.01</b>
<b>Mean</b>		<b>7.42</b>	<b>6.98</b>	<b>7.27</b>	<b>7.95</b>	<b>7.72</b>	<b>7.47</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	7.56	6.66	7.53	8.82	8.00	<b>7.71</b>
2. PBW 590 (C)	10	7.35	7.95	7.02	8.64	7.56	<b>7.70</b>
3. WH 1021 (C)	05	8.76	6.47	6.80	8.93	9.01	<b>7.99</b>
4. HD 3059 (C)	06	7.88	7.56	7.30	7.85	8.27	<b>7.77</b>
5. DBW 90 (I)	09	6.74	7.90	7.80	8.21	7.82	<b>7.70</b>
6. WH 1124 (I)	04	6.94	8.21	7.60	8.74	8.59	<b>8.02</b>
<b>Mean</b>		<b>7.54</b>	<b>7.46</b>	<b>7.34</b>	<b>8.53</b>	<b>8.21</b>	<b>7.82</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	7.37	-	5.90	-	7.80	<b>7.02</b>
2. WH 1080 (C)	04	7.14	-	6.30	-	8.40	<b>7.28</b>
3. PBW 660 (I)	01	6.59	-	6.85	-	7.75	<b>7.07</b>
<b>Mean</b>		<b>7.03</b>	-	<b>6.35</b>	-	<b>7.98</b>	<b>7.12</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	7.06	-	5.90	8.57	8.53	<b>7.51</b>
2. PBW 644 (C)	03	7.33	-	7.23	7.53	8.29	<b>7.60</b>
3. WH 1080 (C)	04	6.61	-	6.71	8.70	8.10	<b>7.53</b>
4. HD 3043 (C)	06	7.50	-	5.80	8.35	8.05	<b>7.42</b>
<b>Mean</b>		<b>7.12</b>	-	<b>6.41</b>	<b>8.29</b>	<b>8.24</b>	<b>7.52</b>

**Table 63: Biscuit Spread Factor of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	8.51	7.51	8.81	<b>8.28</b>
2. DBW 39 (C)	08	8.60	7.93	8.92	<b>8.48</b>
3. HD 2733 (C)	05	8.51	8.93	8.99	<b>8.81</b>
4. NW 5054 (I)	06	8.79	8.46	8.88	<b>8.71</b>
5. K 1006 (I)	13	8.48	8.37	8.79	<b>8.55</b>
<b>Mean</b>		<b>8.58</b>	<b>8.24</b>	<b>8.88</b>	<b>8.56</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	8.18	7.73	8.58	<b>8.16</b>
2. DBW 107	03	8.48	8.03	7.68	<b>8.06</b>
3. K 1114	08	8.13	8.27	8.16	<b>8.18</b>
4. NW 2036 (C)	13	9.04	8.75	8.68	<b>8.82</b>
5. DBW 14 (C)	12	8.40	8.93	8.23	<b>8.52</b>
6. HD 2985 (C)	01	8.68	7.56	8.05	<b>8.09</b>
7. HI 1563 (C)	09	8.40	7.95	7.32	<b>7.89</b>
<b>Mean</b>		<b>8.47</b>	<b>8.17</b>	<b>8.10</b>	<b>8.25</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	8.21	7.82	7.95	<b>7.99</b>
2. C 306 (C)	03	8.59	7.17	-	<b>7.88</b>
3. K 8027 (C)	05	8.51	7.41	8.43	<b>8.12</b>
4. HD 2888 (C)	04	6.95	6.80	8.85	<b>7.54</b>
<b>Mean</b>		<b>8.07</b>	<b>7.30</b>	<b>8.41</b>	<b>7.93</b>

**Table 64: Biscuit Spread Factor of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	7.36	7.28	7.58	7.10	6.80	<b>7.22</b>
2. GW 322 (C)	09	7.70	7.97	6.80	8.47	8.05	<b>7.80</b>
3. HI 1544 (C)	10	7.53	7.79		7.04	6.45	<b>7.20</b>
<b>Mean</b>		<b>7.53</b>	<b>7.68</b>	<b>7.19</b>	<b>7.53</b>	<b>7.10</b>	<b>7.41</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	6.99	6.36	7.87	6.21	7.43	<b>6.97</b>
2. HD 2864 (C)	03	7.27	7.95	8.00	5.78	8.16	<b>7.43</b>
3. HD 2932 (C)	01	8.78	8.71	8.90	6.53	7.23	<b>8.03</b>
4. MP 3336 (C)	04	8.05	8.13	7.21		8.22	<b>7.90</b>
<b>Mean</b>		<b>7.77</b>	<b>7.79</b>	<b>8.00</b>	<b>6.17</b>	<b>7.76</b>	<b>7.50</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	8.41	6.62	-	-	-	<b>7.52</b>
2. PBW 689	17	6.92	8.21	-	-	-	<b>7.56</b>
3. WH 1142	01	8.27	8.18	-	-	-	<b>8.23</b>
4. HI 1500 (C)	16	6.92	7.27	-	-	-	<b>7.09</b>
5. MP 3288 (C)	15	5.92	7.87	-	-	-	<b>6.89</b>
<b>Mean</b>		<b>7.29</b>	<b>7.63</b>	-	-	-	<b>7.46</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	7.05	5.62	-	-	-	<b>6.33</b>
2. HI 1500 (C)	01	6.76	5.91	-	-	-	<b>6.34</b>
3. MP 3288 (C)	02	6.77	6.19	-	-	-	<b>6.48</b>
4. HI 8627 (C) (d)	04	6.96		-	-	-	<b>6.96</b>
<b>Mean</b>		<b>6.88</b>	<b>5.91</b>	-	-	-	<b>6.40</b>

**Table 65: Biscuit Spread Factor of *T.aestivum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. MACS 6222 (C)	02	6.43	7.60	5.31	<b>6.45</b>
2. MACS 6478 (I)	04	6.34	6.30	5.63	<b>6.09</b>
<b>Mean</b>		<b>6.38</b>	<b>6.95</b>	<b>5.47</b>	<b>6.27</b>
<b>Irrigated, Late Sown</b>					
1. HD 2932 (C)	03	5.13	5.90	5.60	<b>5.54</b>
2. Raj 4083 (C)	02	5.25	5.53	6.06	<b>5.62</b>
3. HD 3090 (I)	04	6.45	8.16	7.25	<b>7.29</b>
<b>Mean</b>		<b>5.61</b>	<b>6.53</b>	<b>6.31</b>	<b>6.15</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 347	09	-	8.47	-	<b>8.47</b>
2. NIAW 1994	05	-	7.59	-	<b>7.59</b>
3. NI 5439 (C)	02	-	8.03	-	<b>8.03</b>
4. NIAW 1415 (C)	06	-	7.89	-	<b>7.89</b>
<b>Mean</b>		-	<b>8.00</b>	-	<b>8.00</b>

**Table 66: Biscuit Spread Factor of *T.aestivum* genotypes in Southern Hills Zone AVT's**

Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>						
1. CoW (W) 1 (C)	01	6.37	-	-	-	6.37
2. HW 2044 (C)	05	6.34	-	-	-	6.34
3. HW 5216 (C)	02	5.45	-	-	-	5.45
<b>Mean</b>		<b>6.05</b>	-	-	-	<b>6.05</b>

### **Pasta Quality (Table 67-70)**

Pasta product (macaroni) was prepared from all the 2<sup>nd</sup> year AVT entries including checks. Semolina was extracted and purified from all the centres in ITS condition of CZ and also RTS condition of PZ. The semolina samples of all the respective centres of each zone and sowing condition were mixed and macaroni were prepared from the composite samples. For the evaluation of macaroni cooking quality (Table 67-68), various parameters like cooking time, water absorption, water uptake ratio, gruel solid loss and stickiness were considered. Apart from these, sensory evaluation (Table 69-70) was carried out where parameters like colour, texture & flavor and based on these, overall acceptability using '9' point hedonic scale was considered. The cooking time (minute : second) varied from 10 : 40 (HI 8736, ITS, CZ) to 12 : 50 (AKDW 2997-16, RTS, PZ). The water absorption was maximum in HI 8736 (126%) and minimum in HI 8498 and ADW 2997-16 (116%). The water uptake ratio ranged from 1.16 to 1.26. The lowest gruel solid loss was observed in HI 8736 (1.41%) and the highest was in MPO 1215 (2.23%). Out of six samples, one sample was found non-sticky (NS), four partially sticky (PS) and remaining one was sticky (S). All the 2<sup>nd</sup> year entries, HI 8736 & HI 8737 (ITS, CZ) and UAS 446 (RTS, PZ) scored higher (>7.0) on hedonic scale of 9.0 points compared to all the three checks.



**Table 67: Pasta Cooking Quality of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Cooking Time (Min.:Sec.)	Water Absorption (%)	Water Uptake Ratio	Gruel Solid Loss (%)	Stickness Mean
<b>Irrigated, Timely Sown</b>						
1. HI 8736	06	10:40	126	1.26	1.41	PS
2. HI 8737	01	11:10	122	1.22	1.53	S
3. HI 8498 (C)	11	11:20	116	1.16	2.11	NS
4. MPO 1215 (C)	12	11:40	117	1.17	2.23	PS

**Table 68: Pasta Cooking Quality of *T. durum* genotypes in Peninsular Zone AVT's**

<b>Rainfed, Timely Sown</b>						
1. UAS 446	10	12:30	120	1.20	1.67	PS
2. AKDW 2997-16 (C)	07	12:50	116	1.16	2.15	PS
<b>Mean</b>						

**Table 69: Pasta Sensory Evaluation of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	COLOUR	TEXTURE	FLAVOUR	OVERALL ACCEPTABILITY	RANK
<b>Irrigated, Timely Sown</b>						
1. HI 8736	06	8	7	8	7.7	1
2. HI 8737	01	7	8	7	7.3	2
3. HI 8498 (C)	11	6	7	6	6.3	4
4. MPO 1215 (C)	12	6	6	6	6.0	5

**Table 70: Pasta Sensory Evaluation of *T. durum* genotypes in Peninsular Zone AVT's**

<b>Rainfed, Timely Sown</b>						
1. UAS 446	10	7	8	7	7.3	2
2. AKDW 2997-16 (C)	07	6	6	8	6.7	3

# **SECTION F**

## **GRAIN NUTRITION**

- i. Protein**
- ii. Yellow Pigment**
- iii. Iron**
- iv. Zinc**

# NUTRITIONAL QUALITY

Parameters examined in grain nutrition were protein, iron, zinc and yellow pigment contents. All AVT entries were evaluated for protein, iron and zinc whereas only final entries were considered for yellow pigments.

## **Grain protein content (Tables 1-6 and 25-27)**

Average protein levels in timely sown AVT trials of bread wheat was higher in PZ (12.9%) in comparison to NWPZ, NEPZ and CZ where it ranged between 11.1 to 11.6%. In NHZ, trial mean was around 9.5% in timely and late sown wheats. Trial mean of all other zones had  $\approx 12\%$  protein content under late-sown situation. Entries with GPC  $\geq 13\%$  mostly belonged to PZ and included checks MACS 6222, MACS 6478, HD 2932 and NIAW 1415 in irrigated wheats. New irrigated entries with  $\geq 12\%$  protein in NWPZ were PBW 692, TL 2995, HD 3132, K 1204, WH 1129, DBW 128, PBW 702 and PBW 703. Some like PBW 660 of NWPZ, DBW 110 of CZ also expressed  $\approx 12\%$  GPC under rainfed condition. In irrigated durum, 12% GPC was recorded only in PZ. Trial mean of PZ (12.1%) was much higher in comparison to NWPZ and CZ (11.2%). Highest protein yielder in durum was HI 8755 of CZ (12.6%).

## **Yellow pigments content (Tables 7-12 and 28-30)**

Final year entries of NHZ exhibited good range of yellow pigments content in bread wheat trials and the mean in different trial series varied from 3.6 to 3.8 ppm. VL 907 and HS 542 of NHZ; DBW 39, DBW 107, BRW 3723 and NW 2036 of NEPZ occupied place among top rankers with yellow protein in the range 4.1 to 4.4ppm. Best entry under NWPZ conditions was DBW 90 (4.0ppm). In comparison to trial mean, few entries of PZ (NIAW 1994, NI 5439) and SHZ (CoW (W) 1, HS 5216) were also found promising and range in this lot was 3.8 to 4.1ppm. Yellow pigment content in durum entries ranged between 5.0 to 7.8 ppm in NWPZ, 4.9 to 6.5 ppm in CZ and 3.7 to 6.1ppm in PZ. Yellow pigment content in best irrigated entry of NWPZ i.e. PDW 233 was 7.8ppm whereas best entries of CZ (HD 4730) and PZ (NIDW 295) had only 6.1ppm.

### **Iron content (Tables 13-18 and 31-33)**

Except SHZ, range in iron content was of similar divergence in different trial series of NHZ (31-43ppm), NWPZ (33-44ppm), NEPZ (36-46ppm), CZ (36-51ppm) CZ and PZ (35-46ppm). In SHZ entries however, iron content was much higher (55 to 62ppm). The most promising entries were HPW 401 and HS 591 (43-44ppm) of NHZ; PBW 644, PBW 660 and PBW 706 of NWPZ (43-44ppm); DBW 107, NW 2036 and HD 288 of NEPZ (44-46ppm); PBW 689, MP 3288 and CG 1010 of CZ (49-51ppm); MACS 6222 NIAW 1994 and NI 5439 of PZ (43 to 46ppm) and CoW(W) 1, HW 5216 (60-62ppm) of SHZ. Genotypes with iron content  $\geq 40$ ppm were recorded only in CZ and PZ and majority of this lot belonged to rainfed situation. Top ranking irrigated entries under irrigated conditions with iron  $\approx 40$ ppm were HD 4730 of NWPZ and two checks of PZ i.e. HI 8498 and UAS 428. In rainfed situation, entries registering iron content  $\geq 45$ ppm were A 9-30-1, MACS 3929, UAS 451 of CZ, and HI 8751, HI 8754 and MACS 3927 of PZ.

### **Zinc content (Tables 19-24 and 34-36)**

Zinc content among entries of different trial series varied between 28 to 48ppm in NHZ, 32 to 43 in NWPZ, 29 to 45ppm in NEPZ, 31 to 52ppm in CZ, 31-44ppm in PZ and 41-50ppm in SHZ. Entries with zinc content  $\geq 45$ ppm were HPW 251, HPW 401, HS 590, HS 577 of NHZ; TL 2995 of NWPZ; HD 2888 of NEPZ; NIAW 2030, CG 1010 and HI 500 of CZ, and CoW(W) 1, HW 2044, HW 5216, MACS 6507 of SHZ.

**Table 1: Protein Content (%) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	8.80	8.36	10.13	<b>9.10</b>
2. VL 804 (C)	01	9.14	8.79	11.81	<b>9.91</b>
3. VL 907 (C)	04	9.98	8.25	11.80	<b>10.01</b>
4. HS 507 (C)	03	8.55	8.95	11.09	<b>9.53</b>
5. HPW 349 (C)	05	8.28	8.52	10.92	<b>9.24</b>
6. HS 562	02	8.76	7.85	11.84	<b>9.48</b>
<b>Mean</b>		<b>8.92</b>	<b>8.45</b>	<b>11.27</b>	<b>9.55</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	10.77	8.04	8.90	<b>9.24</b>
2. VL 804 (C)	01	10.56	8.07	9.20	<b>9.28</b>
3. VL 907 (C)	04	11.12	8.15	8.54	<b>9.27</b>
4. HS 507 (C)	03	12.39	8.25	8.52	<b>9.72</b>
5. HPW 349 (C)	05	10.38	8.19	8.78	<b>9.12</b>
6. HS 562	02	11.87	8.01	8.80	<b>9.56</b>
<b>Mean</b>		<b>11.18</b>	<b>8.12</b>	<b>8.79</b>	<b>9.36</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	11.52	8.79	8.44	<b>9.58</b>
2. HS 277 (C)	12	11.26	8.15	8.23	<b>9.21</b>
3. VL 829 (C)	13	10.89	8.31	8.70	<b>9.30</b>
4. HPW 251 (C)	03	13.39	8.40	8.47	<b>10.09</b>
5. HS 542 (I)	09	11.42	8.29	8.47	<b>9.39</b>
6. HPW 400	02	11.84	9.97	8.39	<b>10.07</b>
7. HPW 401	04	12.28	11.15	11.77	<b>11.73</b>
8. HS 590	10	11.63	10.94	9.78	<b>10.78</b>
9. HS 591	11	12.45	10.07	9.46	<b>10.66</b>
10. HS 595	08	12.39	9.40	9.35	<b>10.38</b>
11. VL 1003	06	11.68	8.31	8.81	<b>9.60</b>
12. VL 1004	07	10.87	9.02	8.92	<b>9.60</b>
13. UP 2890	01	10.91	8.29	8.83	<b>9.34</b>
<b>Mean</b>		<b>11.73</b>	<b>9.16</b>	<b>9.05</b>	<b>9.98</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	9.56	9.79	8.23	<b>9.19</b>
2. HS 490 (C)	08	9.94	9.63	8.77	<b>9.45</b>
3. HS 577	12	10.23	10.29	8.49	<b>9.67</b>
4. HS 592	04	9.71	10.63	8.36	<b>9.57</b>
5. HS 593	10	10.21	10.13	8.96	<b>9.77</b>
6. HS 594	02	10.65	10.55	8.70	<b>9.97</b>
7. HPW 410	03	11.77	10.27	9.10	<b>10.38</b>
8. HPW 411	01	8.27	9.81	9.06	<b>9.05</b>
9. HPW 412	11	11.60	10.26	9.20	<b>10.35</b>
10. VL 3002	06	10.25	11.60	8.75	<b>10.20</b>
11. VL 3004	09	10.51	10.84	9.95	<b>10.43</b>
12. VL 3005	13	10.24	12.52	8.88	<b>10.55</b>
13. VL 3006	05	8.63	11.23	8.93	<b>9.60</b>
14. UP 2891	14	9.84	10.65	9.07	<b>9.85</b>
<b>Mean</b>		<b>10.10</b>	<b>10.59</b>	<b>8.89</b>	<b>9.86</b>

**Table 2: Protein Content (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	11.23	11.94	12.71	11.97	10.98	<b>11.77</b>
2. WH 1138	10	11.68	11.30	11.57	11.18	11.06	<b>11.36</b>
3. HUW 666	23	11.27	11.81	12.90	12.80	10.80	<b>11.92</b>
4. DPW 621-50 (C)	15	10.47	13.12	12.92	12.34	11.02	<b>11.97</b>
5. HD 2967 (C)	07	11.15	12.11	12.04	11.85	10.10	<b>11.45</b>
6. WH 1105 (C)	20	9.85	12.33	12.05	11.95	10.90	<b>11.42</b>
7. DBW 88 (I)	03	11.21	11.87	13.29	11.53	11.03	<b>11.79</b>
8. HD 3086 (I)	16	10.44	11.64	12.20	12.03	10.71	<b>11.40</b>
9. PBW 677	11	11.56	12.74	12.42	11.45	10.47	<b>11.73</b>
10. PBW 692	14	12.62	12.52	12.08	11.68	11.44	<b>12.07</b>
11. PBW 695	22	11.68	12.05	12.25	10.90	11.20	<b>11.62</b>
12. PBW 697	01	10.69	11.27	11.57	12.48	11.70	<b>11.54</b>
13. PBW 698	17	9.90	11.58	12.36	11.84	11.07	<b>11.35</b>
14. TL 2995	02	11.65	13.37	12.50	12.67	11.73	<b>12.38</b>
15. WH 1154	13	11.09	11.59	11.38	11.88	10.28	<b>11.24</b>
16. WH 1156	04	9.61	11.34	11.93	10.50	9.32	<b>10.54</b>
17. WH 1157	09	10.55	11.64	11.80	11.69	11.21	<b>11.38</b>
18. HUW 675	19	11.77	12.34	12.39	10.33	11.75	<b>11.72</b>
19. HD 3128	08	10.65	12.49	11.98	11.71	11.53	<b>11.67</b>
20. HD 3132	12	11.32	12.79	12.43	12.41	11.68	<b>12.13</b>
21. HD 3133	18	12.14	11.93	11.67	10.93	10.77	<b>11.49</b>
22. DBW 95	06	10.53	12.29	11.53	11.01	11.02	<b>11.28</b>
23. K 1204	21	10.99	12.99	12.17	12.42	11.40	<b>11.99</b>
<b>Mean</b>		<b>11.05</b>	<b>12.13</b>	<b>12.18</b>	<b>11.72</b>	<b>11.01</b>	<b>11.62</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	10.92	12.88	14.32	11.61	11.47	<b>12.24</b>
2. PBW 590 (C)	10	11.55	13.19	12.30	11.36	11.15	<b>11.91</b>
3. WH 1021 (C)	05	10.60	13.54	13.49	11.32	10.69	<b>11.93</b>
4. HD 3059 (C)	06	11.12	13.45	12.77	11.32	11.76	<b>12.08</b>
5. DBW 90 (I)	09	11.16	13.08	12.20	11.33	10.90	<b>11.73</b>
6. WH 1124 (I)	04	10.98	12.75	12.60	10.88	11.11	<b>11.66</b>
7. PBW 702	03	11.61	13.89	12.33	11.24	11.13	<b>12.04</b>
8. PBW 703	02	11.10	13.25	12.68	12.31	11.69	<b>12.21</b>
9. HD 3139	01	10.67	13.18	13.29	11.46	10.89	<b>11.90</b>
10. DBW 128	07	11.39	14.89	13.25	11.25	11.02	<b>12.36</b>
<b>Mean</b>		<b>11.11</b>	<b>13.41</b>	<b>12.92</b>	<b>11.41</b>	<b>11.18</b>	<b>12.01</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	11.69	-	14.23	-	9.38	<b>11.77</b>
2. WH 1080 (C)	04	12.11	-	13.27	-	9.79	<b>11.72</b>
3. PBW 660 (I)	01	13.03	-	13.65	-	9.84	<b>12.17</b>
4. PBW 706	05	12.39	-	12.15	-	10.05	<b>11.53</b>
5. WH 1164	02	11.76	-	13.59	-	9.87	<b>11.74</b>
<b>Mean</b>		<b>12.20</b>	<b>-</b>	<b>13.38</b>	<b>-</b>	<b>9.79</b>	<b>11.79</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	11.84	-	13.62	8.92	9.94	<b>11.08</b>
2. PBW 644 (C)	03	12.12	-	13.60	9.39	9.42	<b>11.13</b>
3. WH 1080 (C)	04	11.36	-	12.86	9.93	10.44	<b>11.15</b>
4. HD 3043 (C)	06	12.10	-	13.52	9.53	10.67	<b>11.46</b>
5. PBW 706	07	11.84	-	13.16	9.19	10.27	<b>11.12</b>
6. MP 1277	02	11.95	-	12.46	9.14	8.96	<b>10.63</b>
7. DBW 129	05	12.46	-	13.84	9.96	11.21	<b>11.87</b>
8. UAS 356	01	11.26	-	12.84	9.84	9.82	<b>10.94</b>
<b>Mean</b>		<b>11.87</b>	<b>-</b>	<b>13.24</b>	<b>9.49</b>	<b>10.09</b>	<b>11.17</b>

**Table 3: Protein Content (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	9.58	12.43	11.11	<b>11.04</b>
2. DBW 39 (C)	08	9.31	12.04	11.00	<b>10.78</b>
3. HD 2733 (C)	05	9.62	11.77	10.99	<b>10.79</b>
4. NW 5054 (I)	06	10.05	12.33	10.89	<b>11.09</b>
5. K 1006 (I)	13	9.72	11.76	11.05	<b>10.84</b>
6. HD 3127	02	9.46	12.30	10.88	<b>10.88</b>
7. HD 3128	04	10.47	13.26	11.43	<b>11.72</b>
8. PBW 677	11	10.40	13.10	11.14	<b>11.55</b>
9. PBW 693	03	10.66	12.99	11.51	<b>11.72</b>
10. WH 1132	07	9.52	12.32	11.58	<b>11.14</b>
11. HUW 661	10	9.40	11.20	10.56	<b>10.39</b>
12. DBW 98	01	9.01	12.07	11.57	<b>10.88</b>
13. UP 2855	09	10.12	12.46	11.54	<b>11.37</b>
<b>Mean</b>		<b>9.79</b>	<b>12.31</b>	<b>11.17</b>	<b>11.09</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	11.15	12.86	10.86	<b>11.62</b>
2. DBW 107	03	11.92	13.29	11.94	<b>12.38</b>
3. K 1114	08	10.17	11.77	9.76	<b>10.57</b>
4. NW 2036 (C)	13	11.45	12.23	10.55	<b>11.41</b>
5. DBW 14 (C)	12	11.55	12.73	11.47	<b>11.92</b>
6. HD 2985 (C)	01	11.02	11.68	10.98	<b>11.23</b>
7. HI 1563 (C)	09	11.00	11.98	10.93	<b>11.30</b>
8. HD 3139	05	11.10	13.32	10.45	<b>11.62</b>
9. DBW 126	11	11.67	13.18	10.98	<b>11.94</b>
10. PBW 701	02	10.71	13.30	11.01	<b>11.67</b>
11. PBW 702	10	11.14	12.30	11.00	<b>11.48</b>
12. PBW 704	07	11.73	13.01	11.96	<b>12.23</b>
13. HUW 677	04	10.46	12.53	9.88	<b>10.96</b>
<b>Mean</b>		<b>11.16</b>	<b>12.63</b>	<b>10.91</b>	<b>11.56</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	9.14	11.75	10.22	<b>10.37</b>
2. C 306 (C)	03	9.03	12.98	8.72	<b>10.24</b>
3. K 8027 (C)	05	8.98	14.05	9.41	<b>10.81</b>
4. HD 2888 (C)	04	10.26	13.73	9.15	<b>11.05</b>
5. HUW 679	02	10.48	13.10	10.31	<b>11.30</b>
6. UAS 356	06	9.43	12.07	9.11	<b>10.20</b>
<b>Mean</b>		<b>9.55</b>	<b>12.95</b>	<b>9.49</b>	<b>10.66</b>

**Table 4: Protein Content (%) of *T.aestivum* genotypes in Central Zone AVT's**

Variety		Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	11.28	13.28	14.25	11.23	12.83	<b>12.57</b>
2.	GW 322 (C)	09	8.72	11.86	11.05	10.42	10.20	<b>10.45</b>
3.	HI 1544 (C)	10	9.94	12.32	12.20	11.07	11.10	<b>11.33</b>
4.	GW 451	03	10.17	11.78	11.79	10.38	10.70	<b>10.96</b>
5.	MACS 6604	07	10.14	11.83	11.83	11.05	11.45	<b>11.26</b>
<b>Mean</b>			<b>10.05</b>	<b>12.21</b>	<b>12.22</b>	<b>10.83</b>	<b>11.26</b>	<b>11.31</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	10.91	13.24	13.18	12.04	12.68	<b>12.41</b>
2.	HD 2864 (C)	03	11.13	12.07	12.49	11.16	12.15	<b>11.80</b>
3.	HD 2932 (C)	01	10.89	12.49	13.42	11.29	12.16	<b>12.05</b>
4.	MP 3336 (C)	04	11.19	13.08	12.81	12.67	11.52	<b>12.25</b>
5.	GW 455	02	10.90	11.74	12.82	11.78	11.53	<b>11.75</b>
<b>Mean</b>			<b>11.00</b>	<b>12.52</b>	<b>12.94</b>	<b>11.79</b>	<b>12.01</b>	<b>12.05</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	13.84	9.13	-	-	-	<b>11.49</b>
2.	PBW 689	17	13.33	9.72	-	-	-	<b>11.53</b>
3.	WH 1142	01	11.81	8.77	-	-	-	<b>10.29</b>
4.	HI 1500 (C)	16	13.29	9.29	-	-	-	<b>11.29</b>
5.	MP 3288 (C)	15	12.56	9.85	-	-	-	<b>11.21</b>
6.	NIAW 2030	03	12.33	9.52	-	-	-	<b>10.93</b>
7.	MP 1279	11	13.27	9.54	-	-	-	<b>11.41</b>
8.	K 1215	04	12.16	8.91	-	-	-	<b>10.54</b>
9.	K 1217	02	13.56	9.14	-	-	-	<b>11.35</b>
10.	CG 1010	07	14.29	11.61	-	-	-	<b>12.95</b>
<b>Mean</b>			<b>13.04</b>	<b>9.55</b>	-	-	-	<b>11.30</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	11.84	13.09	-	-	-	<b>12.47</b>
2.	HI 1500 (C)	01	11.52	11.99	-	-	-	<b>11.76</b>
3.	MP 3288 (C)	02	10.51	13.10	-	-	-	<b>11.81</b>
4.	HI 8627 (C) (d)	04	9.94	9.30	-	-	-	<b>9.62</b>
5.	HD 3146	05	9.99	12.54	-	-	-	<b>11.27</b>
<b>Mean</b>			<b>10.76</b>	<b>12.00</b>	-	-	-	<b>11.38</b>



**Table 5: Protein Content (%) of *T.aestivum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	MACS 6222 (C)	02	12.39	14.67	12.29	<b>13.12</b>
2.	MACS 6478 (I)	04	12.49	14.17	12.65	<b>13.10</b>
3.	MACS 6604	07	12.06	13.79	11.66	<b>12.50</b>
	<b>Mean</b>		<b>12.31</b>	<b>14.21</b>	<b>12.20</b>	<b>12.91</b>
<b>Irrigated, Late Sown</b>						
1.	HD 2932 (C)	03	13.10	12.93	13.34	<b>13.12</b>
2.	Raj 4083 (C)	02	12.54	12.50	13.03	<b>12.69</b>
3.	HD 3090 (I)	04	12.14	12.00	13.32	<b>12.49</b>
4.	HUW 677	01	11.08	10.54	11.76	<b>11.13</b>
5.	UP 2864	05	12.50	10.38	13.20	<b>12.03</b>
6.	K 1213	06	11.68	10.15	12.44	<b>11.42</b>
	<b>Mean</b>		<b>12.17</b>	<b>11.42</b>	<b>12.85</b>	<b>12.15</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 347	09	-	12.00	-	<b>12.00</b>
2.	NIAW 1994	05	-	12.44	-	<b>12.44</b>
3.	NI 5439 (C)	02	-	12.78	-	<b>12.78</b>
4.	NIAW 1415 (C)	06	-	13.21	-	<b>13.21</b>
5.	NIAW 2030	01	-	14.40	-	<b>14.40</b>
	<b>Mean</b>		-	<b>12.97</b>	-	<b>12.97</b>

**Table 6: Protein Content (%) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

	Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>							
1.	CoW (W) 1 (C)	01	11.94	11.26	14.31	11.41	<b>12.23</b>
2.	HW 2044 (C)	05	11.74	12.70	11.99	12.81	<b>12.31</b>
3.	HW 5216 (C)	02	11.67	12.72	14.70	12.61	<b>12.93</b>
4.	UAS 358	03	11.61	12.21	12.54	11.50	<b>11.97</b>
5.	MACS 6507	04	12.80	13.52	14.24	14.33	<b>13.72</b>
	<b>Mean</b>		<b>11.95</b>	<b>12.48</b>	<b>13.56</b>	<b>12.53</b>	<b>12.63</b>

**Table :7 Yellow Pigment content (ppm) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	3.67	3.81	3.59	<b>3.69</b>
2. VL 804 (C)	01	3.60	3.96	4.20	<b>3.92</b>
3. VL 907 (C)	04	4.25	4.67	4.45	<b>4.46</b>
4. HS 507 (C)	03	3.25	3.46	3.31	<b>3.34</b>
5. HPW 349 (C)	05	2.80	2.40	2.72	<b>2.64</b>
<b>Mean</b>		<b>3.51</b>	<b>3.66</b>	<b>3.65</b>	<b>3.61</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	3.81	3.43	3.72	<b>3.65</b>
2. VL 804 (C)	01	3.81	4.01	4.36	<b>4.06</b>
3. VL 907 (C)	04	4.11	4.51	4.29	<b>4.30</b>
4. HS 507 (C)	03	3.41	3.67	3.51	<b>3.53</b>
5. HPW 349 (C)	05	2.71	2.67	2.91	<b>2.76</b>
<b>Mean</b>		<b>3.57</b>	<b>3.66</b>	<b>3.76</b>	<b>3.66</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	3.91	3.67	3.73	<b>3.77</b>
2. HS 277 (C)	12	3.61	3.37	3.56	<b>3.51</b>
3. VL 829 (C)	13	3.87	4.11	4.01	<b>4.00</b>
4. HPW 251 (C)	03	3.67	3.41	3.57	<b>3.55</b>
5. HS 542 (I)	09	4.41	3.91	4.27	<b>4.20</b>
<b>Mean</b>		<b>3.89</b>	<b>3.69</b>	<b>3.83</b>	<b>3.81</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	3.19	2.96	3.29	<b>3.15</b>
2. HS 490 (C)	08	3.87	4.19	4.01	<b>4.02</b>
<b>Mean</b>		<b>3.53</b>	<b>3.58</b>	<b>3.65</b>	<b>3.59</b>

**Table 8: Yellow Pigment content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	3.91	3.81	3.61	3.41	4.11	<b>3.77</b>
2. WH 1138	10	3.77	3.61	3.49	2.91	3.27	<b>3.41</b>
3. HUW 666	23	3.11	2.91	2.77	2.49	3.19	<b>2.89</b>
4. DPW 621-50(C)	15	3.01	2.87	3.19	2.96	3.10	<b>3.03</b>
5. HD 2967 (C)	07	3.67	3.31	3.71	2.96	3.31	<b>3.39</b>
6. WH 1105 (C)	20	3.81	3.47	3.67	3.17	3.41	<b>3.51</b>
7. DBW 88 (I)	03	3.27	2.91	3.11	2.87	3.41	<b>3.11</b>
8. HD 3086 (I)	16	3.11	2.79	2.81	2.67	3.23	<b>2.92</b>
<b>Mean</b>		<b>3.46</b>	<b>3.21</b>	<b>3.30</b>	<b>2.93</b>	<b>3.38</b>	<b>3.25</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	4.29	3.67	4.11	3.71	3.87	<b>3.93</b>
2. PBW 590 (C)	10	3.11	2.87	3.05	2.61	3.27	<b>2.98</b>
3. WH 1021 (C)	05	3.27	2.96	3.19	2.87	3.31	<b>3.12</b>
4. HD 3059 (C)	06	2.81	3.11	2.67	2.47	2.51	<b>2.71</b>
5. DBW 90 (I)	09	4.11	3.67	3.92	4.19	3.92	<b>3.96</b>
6. WH 1124 (I)	04	3.67	3.37	3.51	2.91	3.71	<b>3.43</b>
<b>Mean</b>		<b>3.54</b>	<b>3.28</b>	<b>3.41</b>	<b>3.13</b>	<b>3.43</b>	<b>3.36</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	3.67	-	3.11	-	3.47	<b>3.42</b>
2. WH 1080 (C)	04	4.11	-	3.67	-	3.41	<b>3.73</b>
3. PBW 660 (I)	01	3.11	-	2.67	-	2.91	<b>2.90</b>
<b>Mean</b>		<b>3.63</b>	-	<b>3.15</b>	-	<b>3.26</b>	<b>3.35</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	3.81	-	3.67	3.96	3.77	<b>3.80</b>
2. PBW 644 (C)	03	3.19	-	2.96	3.31	3.11	<b>3.14</b>
3. WH 1080 (C)	04	3.11	-	2.67	2.81	2.57	<b>2.79</b>
4. HD 3043 (C)	06	3.69	-	3.47	3.71	3.37	<b>3.56</b>
<b>Mean</b>		<b>3.45</b>	-	<b>3.19</b>	<b>3.45</b>	<b>3.21</b>	<b>3.32</b>

**Table 9: Yellow Pigment content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	3.19	2.87	3.11	<b>3.06</b>
2. DBW 39 (C)	08	4.14	3.96	4.23	<b>4.11</b>
3. HD 2733 (C)	05	3.19	2.77	2.93	<b>2.96</b>
4. NW 5054 (I)	06	3.11	2.81	2.77	<b>2.90</b>
5. K 1006 (I)	13	3.23	2.96	3.11	<b>3.10</b>
<b>Mean</b>		<b>3.37</b>	<b>3.07</b>	<b>3.23</b>	<b>3.23</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	3.11	2.97	3.37	<b>3.15</b>
2. DBW 107	03	4.37	3.96	4.11	<b>4.15</b>
3. K 1114	08	3.67	3.37	3.71	<b>3.58</b>
4. NW 2036 (C)	13	4.19	3.97	4.41	<b>4.19</b>
5. DBW 14 (C)	12	4.11	3.57	3.71	<b>3.80</b>
6. HD 2985 (C)	01	3.23	2.77	2.91	<b>2.97</b>
7. HI 1563 (C)	09	3.11	2.67	2.41	<b>2.73</b>
<b>Mean</b>		<b>3.68</b>	<b>3.33</b>	<b>3.52</b>	<b>3.51</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	4.23	3.96	4.11	<b>4.10</b>
2. C 306 (C)	03	4.11	3.77	3.86	<b>3.91</b>
3. K 8027 (C)	05	4.23	3.81	3.67	<b>3.90</b>
4. HD 2888 (C)	04	4.39	3.76	3.81	<b>3.99</b>
<b>Mean</b>		<b>4.24</b>	<b>3.83</b>	<b>3.86</b>	<b>3.98</b>

**Table 10: Yellow Pigment content (ppm) of *T.aestivum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. MP 3382	05	3.23	2.81	2.96	3.37	3.01	<b>3.08</b>
2. GW 322 (C)	09	3.11	2.67	2.81	3.05	2.47	<b>2.82</b>
3. HI 1544 (C)	10	2.91	2.51	2.67	2.77	2.41	<b>2.65</b>
<b>Mean</b>		<b>3.08</b>	<b>2.66</b>	<b>2.81</b>	<b>3.06</b>	<b>2.63</b>	<b>2.85</b>
<b>Irrigated, Late Sown</b>							
1. MP 4010 (C)	05	3.11	2.67	3.19	2.81	3.05	<b>2.97</b>
2. HD 2864 (C)	03	3.29	2.81	3.31	2.96	3.05	<b>3.08</b>
3. HD 2932 (C)	01	3.41	2.96	3.11	3.23	2.91	<b>3.12</b>
4. MP 3336 (C)	04	2.41	2.23	2.57	2.31	2.61	<b>2.43</b>
<b>Mean</b>		<b>3.06</b>	<b>2.67</b>	<b>3.05</b>	<b>2.83</b>	<b>2.91</b>	<b>2.90</b>
<b>Rainfed, Timely Sown</b>							
1. NIAW 1885	08	3.61	3.31	-	-	-	<b>3.46</b>
2. PBW 689	17	2.91	2.77	-	-	-	<b>2.84</b>
3. WH 1142	01	3.11	2.96	-	-	-	<b>3.04</b>
4. HI 1500 (C)	16	3.81	3.61	-	-	-	<b>3.71</b>
5. MP 3288 (C)	15	3.11	2.81	-	-	-	<b>2.96</b>
<b>Mean</b>		<b>3.31</b>	<b>3.09</b>	-	-	-	<b>3.20</b>
<b>Restricted Irrigation, Timely Sown</b>							
1. DBW 110	03	4.11	3.77	-	-	-	<b>3.94</b>
2. HI 1500 (C)	01	3.91	3.77	-	-	-	<b>3.84</b>
3. MP 3288 (C)	02	3.05	2.67	-	-	-	<b>2.86</b>
4. HI 8627 (C) (d)	04	6.23	5.91	-	-	-	<b>6.07</b>
<b>Mean</b>		<b>4.33</b>	<b>4.03</b>	-	-	-	<b>4.18</b>

**Table 11: Yellow Pigment content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	MACS 6222 (C)	02	3.11	2.96	3.05	<b>3.04</b>
2.	MACS 6478 (I)	04	3.23	3.11	2.96	<b>3.10</b>
	<b>Mean</b>		<b>3.17</b>	<b>3.04</b>	<b>3.01</b>	<b>3.07</b>
<b>Irrigated, Late Sown</b>						
1.	HD 2932 (C)	03	2.61	2.37	2.51	<b>2.50</b>
2.	Raj 4083 (C)	02	2.11	1.93	2.21	<b>2.08</b>
3.	HD 3090 (I)	04	3.11	2.77	2.91	<b>2.93</b>
	<b>Mean</b>		<b>2.61</b>	<b>2.36</b>	<b>2.54</b>	<b>2.50</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 347	09	-	3.53	-	<b>3.53</b>
2.	NIAW 1994	05	-	3.77	-	<b>3.77</b>
3.	NI 5439 (C)	02	-	3.91	-	<b>3.91</b>
4.	NIAW 1415 (C)	06	-	3.61	-	<b>3.61</b>
	<b>Mean</b>		-	<b>3.71</b>	-	<b>3.71</b>

**Table 12: Yellow Pigment content (ppm) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

	Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>							
1.	CoW (W) 1 (C)	01	4.11	3.96	3.81	4.37	<b>4.06</b>
2.	HW 2044 (C)	05	3.67	3.41	3.37	3.71	<b>3.54</b>
3.	HW 5216 (C)	02	4.05	3.87	3.71	4.21	<b>3.96</b>
	<b>Mean</b>		<b>3.94</b>	<b>3.75</b>	<b>3.63</b>	<b>4.10</b>	<b>3.85</b>

**Table 13: Iron Content (ppm) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	32.6	33.6	35.7	<b>34.0</b>
2. VL 804 (C)	01	31.3	30.6	33.1	<b>31.7</b>
3. VL 907 (C)	04	34.3	32.5	33.9	<b>33.6</b>
4. HS 507 (C)	03	37.2	39.3	34.7	<b>37.1</b>
5. HPW 349 (C)	05	38.1	35.8	32.3	<b>35.4</b>
6. HS 562	02	35.1	34.6	40.9	<b>36.9</b>
<b>Mean</b>		<b>34.8</b>	<b>34.4</b>	<b>35.1</b>	<b>34.8</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	35.5	32.9	29.7	<b>32.7</b>
2. VL 804 (C)	01	37.2	32.3	32.2	<b>33.9</b>
3. VL 907 (C)	04	39.7	32.9	30.5	<b>34.4</b>
4. HS 507 (C)	03	41.8	30.7	36.9	<b>36.5</b>
5. HPW 349 (C)	05	34.5	32.5	36.7	<b>34.6</b>
6. HS 562	02	43.9	37.7	33.6	<b>38.4</b>
<b>Mean</b>		<b>38.8</b>	<b>33.2</b>	<b>33.3</b>	<b>35.1</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	37.5	39.6	37.9	<b>38.3</b>
2. HS 277 (C)	12	37.9	33.7	43.3	<b>38.3</b>
3. VL 829 (C)	13	37.9	37.1	35.0	<b>36.7</b>
4. HPW 251 (C)	03	42.7	43.6	39.5	<b>41.9</b>
5. HS 542 (I)	09	41.6	40.4	40.3	<b>40.8</b>
6. HPW 400	02	40.6	38.8	38.7	<b>39.4</b>
7. HPW 401	04	39.4	43.5	49.2	<b>44.0</b>
8. HS 590	10	41.6	44.8	38.8	<b>41.7</b>
9. HS 591	11	43.2	45.9	41.2	<b>43.4</b>
10. HS 595	08	39.2	43.1	40.6	<b>41.0</b>
11. VL 1003	06	38.1	35.6	35.1	<b>36.3</b>
12. VL 1004	07	38.7	43.7	40.1	<b>40.8</b>
13. UP 2890	01	39.0	43.3	43.0	<b>41.8</b>
<b>Mean</b>		<b>39.8</b>	<b>41.0</b>	<b>40.2</b>	<b>40.3</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	46.7	33.0	36.6	<b>38.8</b>
2. HS 490 (C)	08	38.0	29.8	48.0	<b>38.6</b>
3. HS 577	12	46.9	37.8	39.2	<b>41.3</b>
4. HS 592	04	43.6	30.3	35.5	<b>36.5</b>
5. HS 593	10	43.0	37.1	36.4	<b>38.8</b>
6. HS 594	02	40.2	35.9	38.0	<b>38.0</b>
7. HPW 410	03	46.0	33.4	40.9	<b>40.1</b>
8. HPW 411	01	38.8	34.4	35.4	<b>36.2</b>
9. HPW 412	11	39.7	36.6	44.5	<b>40.3</b>
10. VL 3002	06	45.3	32.4	37.7	<b>38.5</b>
11. VL 3004	09	42.6	36.1	38.3	<b>39.0</b>
12. VL 3005	13	43.0	37.8	42.7	<b>41.2</b>
13. VL 3006	05	44.7	33.8	37.5	<b>38.7</b>
14. UP 2891	14	37.4	38.9	34.3	<b>36.9</b>
<b>Mean</b>		<b>42.6</b>	<b>34.8</b>	<b>38.9</b>	<b>38.8</b>

**Table 14: Iron Content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	33.1	35.0	36.1	-	42.3	<b>36.6</b>
2. WH 1138	10	33.4	38.5	39.4	-	43.1	<b>38.6</b>
3. HUW 666	23	32.9	36.2	39.0	-	39.3	<b>36.9</b>
4. DPW 621-50(C)	15	28.6	34.9	39.4	-	35.9	<b>34.7</b>
5. HD 2967 (C)	07	36.7	33.5	31.2	-	42.8	<b>36.1</b>
6. WH 1105 (C)	20	31.0	39.1	35.3	-	40.2	<b>36.4</b>
7. DBW 88 (I)	03	33.0	34.8	36.3	-	40.3	<b>36.1</b>
8. HD 3086 (I)	16	32.4	36.7	40.4	-	38.6	<b>37.0</b>
9. PBW 677	11	36.0	39.0	44.6	-	36.8	<b>39.1</b>
10. PBW 692	14	35.5	38.8	40.4	-	38.4	<b>38.3</b>
11. PBW 695	22	32.0	35.1	38.8	-	39.1	<b>36.3</b>
12. PBW 697	01	32.9	37.6	34.6	-	42.6	<b>36.9</b>
13. PBW 698	17	28.4	34.1	33.4	-	38.6	<b>33.6</b>
14. TL 2995	02	35.6	32.9	37.7	-	40.2	<b>36.6</b>
15. WH 1154	13	35.4	36.2	36.5	-	40.3	<b>37.1</b>
16. WH 1156	04	28.5	30.2	38.4	-	34.6	<b>32.9</b>
17. WH 1157	09	32.3	43.1	35.5	-	38.8	<b>37.4</b>
18. HUW 675	19	34.8	41.8	36.7	-	39.4	<b>38.2</b>
19. HD 3128	08	34.6	37.6	38.3	-	39.5	<b>37.5</b>
20. HD 3132	12	34.2	35.6	37.4	-	38.4	<b>36.4</b>
21. HD 3133	18	30.5	40.9	39.8	-	40.9	<b>38.0</b>
22. DBW 95	06	33.0	39.6	36.7	-	33.6	<b>35.7</b>
23. K 1204	21	36.5	41.3	39.4	-	39.2	<b>39.1</b>
<b>Mean</b>		<b>33.1</b>	<b>37.1</b>	<b>37.6</b>	-	<b>39.3</b>	<b>36.8</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	31.2	33.3	41.9	-	36.1	<b>35.6</b>
2. PBW 590 (C)	10	33.0	37.2	41.1	-	32.5	<b>36.0</b>
3. WH 1021 (C)	05	33.0	36.1	40.2	-	35.9	<b>36.3</b>
4. HD 3059 (C)	06	30.2	30.7	39.6	-	30.5	<b>32.8</b>
5. DBW 90 (I)	09	31.9	32.7	41.3	-	32.3	<b>34.6</b>
6. WH 1124 (I)	04	30.9	33.8	43.9	-	36.1	<b>36.2</b>
7. PBW 702	03	28.3	32.7	37.6	-	32.2	<b>32.7</b>
8. PBW 703	02	32.2	38.0	43.0	-	36.8	<b>37.5</b>
9. HD 3139	01	32.0	36.4	41.6	-	31.4	<b>35.4</b>
10. DBW 128	07	31.5	35.0	37.4	-	32.2	<b>34.0</b>
<b>Mean</b>		<b>31.4</b>	<b>34.6</b>	<b>40.8</b>	-	<b>33.6</b>	<b>35.1</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	45.1	-	45.5	-	38.3	<b>43.0</b>
2. WH 1080 (C)	04	38.2	-	37.2	-	35.4	<b>36.9</b>
3. PBW 660 (I)	01	42.3	-	46.1	-	41.5	<b>43.3</b>
4. PBW 706	05	43.9	-	47.1	-	39.7	<b>43.6</b>
5. WH 1164	02	46.1	-	39.8	-	39.0	<b>41.6</b>
<b>Mean</b>		<b>43.1</b>	-	<b>43.1</b>	-	<b>38.8</b>	<b>41.7</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	34.7	-	41.0	33.3	36.5	<b>36.4</b>
2. PBW 644 (C)	03	44.0	-	41.9	36.8	40.9	<b>40.9</b>
3. WH 1080 (C)	04	31.6	-	35.3	35.6	37.8	<b>35.1</b>
4. HD 3043 (C)	06	34.0	-	37.7	36.0	32.2	<b>35.0</b>
5. PBW 706	07	36.3	-	38.5	35.7	38.0	<b>37.1</b>
6. MP 1277	02	34.5	-	37.1	34.6	41.0	<b>36.8</b>
7. DBW 129	05	41.6	-	42.1	41.0	36.1	<b>40.2</b>
8. UAS 356	01	36.4	-	37.4	34.8	34.3	<b>35.7</b>
<b>Mean</b>		<b>36.6</b>	-	<b>38.9</b>	<b>36.0</b>	<b>37.1</b>	<b>37.1</b>

**Table 15: Iron Content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	38.3	47.8	36.1	<b>40.7</b>
2. DBW 39 (C)	08	40.2	34.4	34.4	<b>36.3</b>
3. HD 2733 (C)	05	38.1	33.8	44.9	<b>38.9</b>
4. NW 5054 (I)	06	41.4	35.3	33.6	<b>36.8</b>
5. K 1006 (I)	13	36.7	39.5	35.8	<b>37.3</b>
6. HD 3127	02	37.1	37.9	33.9	<b>36.3</b>
7. HD 3128	04	40.2	36.7	42.3	<b>39.7</b>
8. PBW 677	11	40.6	40.7	35.5	<b>38.9</b>
9. PBW 693	03	41.7	41.7	37.6	<b>40.3</b>
10. WH 1132	07	36.0	38.4	37.4	<b>37.3</b>
11. HUW 661	10	39.3	32.7	39.0	<b>37.0</b>
12. DBW 98	01	41.9	36.3	35.4	<b>37.9</b>
13. UP 2855	09	40.7	40.3	39.0	<b>40.0</b>
<b>Mean</b>		<b>39.4</b>	<b>38.1</b>	<b>37.3</b>	<b>38.3</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	41.1	47.5	36.0	<b>41.5</b>
2. DBW 107	03	51.5	41.5	40.0	<b>44.3</b>
3. K 1114	08	32.6	40.2	29.0	<b>33.9</b>
4. NW 2036 (C)	13	41.9	54.0	40.5	<b>45.5</b>
5. DBW 14 (C)	12	44.0	45.7	35.7	<b>41.8</b>
6. HD 2985 (C)	01	40.4	41.7	32.5	<b>38.2</b>
7. HI 1563 (C)	09	43.4	47.4	35.4	<b>42.1</b>
8. HD 3139	05	33.5	43.9	35.0	<b>37.5</b>
9. DBW 126	11	35.0	45.7	39.2	<b>40.0</b>
10. PBW 701	02	36.9	43.8	35.3	<b>38.7</b>
11. PBW 702	10	36.5	34.9	31.4	<b>34.3</b>
12. PBW 704	07	39.7	38.5	32.8	<b>37.0</b>
13. HUW 677	04	35.7	37.1	36.1	<b>36.3</b>
<b>Mean</b>		<b>39.4</b>	<b>43.2</b>	<b>35.3</b>	<b>39.3</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	36.8	49.6	33.3	<b>39.9</b>
2. C 306 (C)	03	36.0	42.7	38.0	<b>38.9</b>
3. K 8027 (C)	05	36.4	43.5	34.2	<b>38.0</b>
4. HD 2888 (C)	04	38.4	48.5	51.1	<b>46.0</b>
5. HUW 679	02	39.5	51.9	37.0	<b>42.8</b>
6. UAS 356	06	33.2	50.9	28.1	<b>37.4</b>
<b>Mean</b>		<b>36.7</b>	<b>47.9</b>	<b>37.0</b>	<b>40.5</b>

**Table 16: Iron Content (ppm) of *T.aestivum* genotypes in Central Zone AVT's**

Variety		Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	38.6	42.3	40.1	35.5	38.5	<b>39.0</b>
2.	GW 322 (C)	09	34.1	43.7	41.1	39.4	32.0	<b>38.1</b>
3.	HI 1544 (C)	10	40.1	45.7	42.8	41.9	39.1	<b>41.9</b>
4.	GW 451	03	40.9	42.5	35.5	34.5	35.9	<b>37.9</b>
5.	MACS 6604	07	36.3	36.9	43.1	34.1	32.5	<b>36.6</b>
<b>Mean</b>			<b>38.0</b>	<b>42.2</b>	<b>40.5</b>	<b>37.1</b>	<b>35.6</b>	<b>38.7</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	36.6	44.8	46.8	38.3	39.1	<b>41.1</b>
2.	HD 2864 (C)	03	39.8	39.4	53.4	37.1	32.4	<b>40.4</b>
3.	HD 2932 (C)	01	35.4	37.4	35.9	38.5	34.7	<b>36.4</b>
4.	MP 3336 (C)	04	40.5	41.5	42.7	48.3	33.0	<b>41.2</b>
5.	GW 455	02	39.8	39.3	52.4	41.2	35.6	<b>41.7</b>
<b>Mean</b>			<b>38.4</b>	<b>40.5</b>	<b>46.2</b>	<b>40.7</b>	<b>35.0</b>	<b>40.2</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	49.4	37.8	-	-	-	<b>43.6</b>
2.	PBW 689	17	57.9	44.4	-	-	-	<b>51.2</b>
3.	WH 1142	01	45.6	37.4	-	-	-	<b>41.5</b>
4.	HI 1500 (C)	16	50.0	46.9	-	-	-	<b>48.5</b>
5.	MP 3288 (C)	15	54.7	46.0	-	-	-	<b>50.4</b>
6.	NIAW 2030	03	52.1	42.3	-	-	-	<b>47.2</b>
7.	MP 1279	11	48.3	42.7	-	-	-	<b>45.5</b>
8.	K 1215	04	47.5	35.7	-	-	-	<b>41.6</b>
9.	K 1217	02	55.9	37.6	-	-	-	<b>46.8</b>
10.	CG 1010	07	50.4	47.2	-	-	-	<b>48.8</b>
<b>Mean</b>			<b>51.2</b>	<b>41.8</b>	-	-	-	<b>46.5</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	39.9	36.4	-	-	-	<b>38.2</b>
2.	HI 1500 (C)	01	48.6	46.5	-	-	-	<b>47.6</b>
3.	MP 3288 (C)	02	42.6	38.0	-	-	-	<b>40.3</b>
4.	HI 8627 (C) (d)	04	39.3	39.0	-	-	-	<b>39.2</b>
5.	HD 3146	05	40.0	38.0	-	-	-	<b>39.0</b>
<b>Mean</b>			<b>42.1</b>	<b>39.6</b>	-	-	-	<b>40.8</b>



**Table 17: Iron Content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	MACS 6222 (C)	02	38.5	47.7	42.7	<b>43.0</b>
2.	MACS 6478 (I)	04	38.7	41.2	35.9	<b>38.6</b>
3.	MACS 6604	07	37.1	40.2	36.1	<b>37.8</b>
	<b>Mean</b>		<b>38.1</b>	<b>43.0</b>	<b>38.2</b>	<b>39.8</b>
<b>Irrigated, Late Sown</b>						
1.	HD 2932 (C)	03	43.4	38.9	36.7	<b>39.7</b>
2.	Raj 4083 (C)	02	41.6	43.1	39.4	<b>41.4</b>
3.	HD 3090 (I)	04	36.0	39.6	36.9	<b>37.5</b>
4.	HUW 677	01	34.9	37.8	38.1	<b>36.9</b>
5.	UP 2864	05	43.0	37.0	40.6	<b>40.2</b>
6.	K 1213	06	37.9	30.8	37.2	<b>35.3</b>
	<b>Mean</b>		<b>39.5</b>	<b>37.9</b>	<b>38.2</b>	<b>38.5</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 347	09	-	37.5	-	<b>37.5</b>
2.	NIAW 1994	05	-	43.0	-	<b>43.0</b>
3.	NI 5439 (C)	02	-	46.4	-	<b>46.4</b>
4.	NIAW 1415 (C)	06	-	43.9	-	<b>43.9</b>
5.	NIAW 2030	01	-	39.5	-	<b>39.5</b>
	<b>Mean</b>		-	<b>42.1</b>	-	<b>42.1</b>

**Table 18: Iron Content (ppm) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

	Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>							
1.	CoW (W) 1 (C)	01	62.3	57.7	68.3	59.9	<b>62.1</b>
2.	HW 2044 (C)	05	52.5	57.9	64.8	54.7	<b>57.5</b>
3.	HW 5216 (C)	02	46.8	58.7	67.4	65.4	<b>59.6</b>
4.	UAS 358	03	51.2	49.0	62.7	56.5	<b>54.9</b>
5.	MACS 6507	04	57.2	51.3	66.0	55.6	<b>57.5</b>
	<b>Mean</b>		<b>54.0</b>	<b>54.9</b>	<b>65.8</b>	<b>58.4</b>	<b>58.3</b>

**Table 19: Zinc Content (ppm) of *T.aestivum* genotypes in Northern Hill Zone AVT's**

Variety	Code	Almora	Shimla	Malan	Mean
<b>Irrigated, Timely Sown, High Fertility</b>					
1. VL 967	06	32.2	30.8	21.8	<b>28.3</b>
2. VL 804 (C)	01	31.9	27.3	21.7	<b>27.0</b>
3. VL 907 (C)	04	39.5	28.9	26.1	<b>31.5</b>
4. HS 507 (C)	03	41.4	37.3	22.2	<b>33.6</b>
5. HPW 349 (C)	05	41.5	34.8	20.0	<b>32.1</b>
6. HS 562	02	35.4	30.4	19.7	<b>28.5</b>
<b>Mean</b>		<b>37.0</b>	<b>31.6</b>	<b>21.9</b>	<b>30.2</b>
<b>Rainfed, Timely Sown, Low Fertility</b>					
1. VL 967	06	41.5	30.4	22.7	<b>31.5</b>
2. VL 804 (C)	01	43.5	33.3	23.6	<b>33.5</b>
3. VL 907 (C)	04	48.5	29.2	24.3	<b>34.0</b>
4. HS 507 (C)	03	43.4	24.6	25.6	<b>31.2</b>
5. HPW 349 (C)	05	36.3	29.4	23.3	<b>29.7</b>
6. HS 562	02	49.5	26.8	19.8	<b>32.0</b>
<b>Mean</b>		<b>43.8</b>	<b>29.0</b>	<b>23.2</b>	<b>32.0</b>
<b>Rainfed, Early Sown</b>					
1. HPW 376	05	47.4	29.8	25.1	<b>34.1</b>
2. HS 277 (C)	12	45.0	39.8	25.4	<b>36.7</b>
3. VL 829 (C)	13	46.1	30.9	20.0	<b>32.3</b>
4. HPW 251 (C)	03	54.8	49.8	29.8	<b>44.8</b>
5. HS 542 (I)	09	45.6	44.8	22.6	<b>37.7</b>
6. HPW 400	02	45.3	33.9	26.8	<b>35.3</b>
7. HPW 401	04	50.5	54.2	38.4	<b>47.7</b>
8. HS 590	10	52.7	53.2	30.3	<b>45.4</b>
9. HS 591	11	51.3	47.9	28.6	<b>42.6</b>
10. HS 595	08	50.6	47.9	28.5	<b>42.3</b>
11. VL 1003	06	41.7	24.8	19.9	<b>28.8</b>
12. VL 1004	07	51.0	47.6	34.3	<b>44.3</b>
13. UP 2890	01	51.2	48.9	32.1	<b>44.1</b>
<b>Mean</b>		<b>48.7</b>	<b>42.6</b>	<b>27.8</b>	<b>39.7</b>
<b>Restricted Irrigation, Late Sown</b>					
1. VL 892 (C)	07	38.4	37.7	27.5	<b>34.5</b>
2. HS 490 (C)	08	38.6	36.0	28.5	<b>34.4</b>
3. HS 577	12	44.4	55.9	34.0	<b>44.8</b>
4. HS 592	04	36.0	29.7	25.6	<b>30.4</b>
5. HS 593	10	42.7	45.3	36.8	<b>41.6</b>
6. HS 594	02	36.3	41.2	28.6	<b>35.4</b>
7. HPW 410	03	36.5	38.1	26.7	<b>33.8</b>
8. HPW 411	01	30.6	39.6	24.4	<b>31.5</b>
9. HPW 412	11	37.3	50.5	24.2	<b>37.3</b>
10. VL 3002	06	35.3	38.1	22.9	<b>32.1</b>
11. VL 3004	09	39.8	41.6	28.3	<b>36.6</b>
12. VL 3005	13	39.4	53.2	34.4	<b>42.3</b>
13. VL 3006	05	34.9	38.3	25.1	<b>32.8</b>
14. UP 2891	14	37.3	52.7	27.7	<b>39.2</b>
<b>Mean</b>		<b>37.7</b>	<b>42.7</b>	<b>28.2</b>	<b>36.2</b>

**Table 20: Zinc Content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PBW 681	05	31.7	38.1	40.0	28.7	48.7	<b>37.4</b>
2. WH 1138	10	32.2	38.2	38.7	27.1	40.4	<b>35.3</b>
3. HUW 666	23	31.4	34.5	36.1	25.3	36.3	<b>32.7</b>
4. DPW 621-50(C)	15	35.3	32.5	40.1	25.4	33.4	<b>33.3</b>
5. HD 2967 (C)	07	32.3	35.0	34.1	26.4	43.5	<b>34.3</b>
6. WH 1105 (C)	20	35.1	39.7	39.7	25.2	43.8	<b>36.7</b>
7. DBW 88 (I)	03	30.2	39.7	35.0	25.3	35.2	<b>33.1</b>
8. HD 3086 (I)	16	32.4	32.6	44.5	25.3	37.6	<b>34.5</b>
9. PBW 677	11	36.3	41.3	43.2	33.9	34.4	<b>37.8</b>
10. PBW 692	14	36.5	43.1	39.5	30.1	38.8	<b>37.6</b>
11. PBW 695	22	32.2	37.5	41.5	29.9	39.9	<b>36.2</b>
12. PBW 697	01	37.7	35.7	38.3	25.1	43.8	<b>36.1</b>
13. PBW 698	17	36.2	40.7	36.9	29.1	42.8	<b>37.1</b>
14. TL 2995	02	48.2	51.3	52.5	39.0	53.8	<b>49.0</b>
15. WH 1154	13	28.3	41.2	38.7	25.3	37.9	<b>34.3</b>
16. WH 1156	04	27.8	35.9	39.7	24.0	35.5	<b>32.6</b>
17. WH 1157	09	34.6	35.0	42.7	25.2	39.8	<b>35.5</b>
18. HUW 675	19	29.5	34.2	37.4	24.2	35.3	<b>32.1</b>
19. HD 3128	08	29.9	40.5	45.4	23.5	42.9	<b>36.4</b>
20. HD 3132	12	29.0	39.2	34.9	26.4	35.9	<b>33.1</b>
21. HD 3133	18	40.1	41.2	43.6	30.4	43.1	<b>39.7</b>
22. DBW 95	06	36.9	41.3	33.6	25.3	43.6	<b>36.1</b>
23. K 1204	21	36.7	48.7	41.0	27.3	43.7	<b>39.5</b>
<b>Mean</b>		<b>33.9</b>	<b>39.0</b>	<b>39.9</b>	<b>27.3</b>	<b>40.4</b>	<b>36.1</b>
<b>Irrigated Late Sown</b>							
1. WH 1129	08	36.3	36.4	48.8	23.7	35.4	<b>36.1</b>
2. PBW 590 (C)	10	40.3	44.6	51.0	20.9	38.8	<b>39.1</b>
3. WH 1021 (C)	05	32.2	40.5	48.0	25.1	42.8	<b>37.7</b>
4. HD 3059 (C)	06	28.5	35.5	39.8	22.3	31.6	<b>31.5</b>
5. DBW 90 (I)	09	27.6	35.6	48.1	22.0	35.0	<b>33.7</b>
6. WH 1124 (I)	04	32.2	38.2	48.9	27.8	36.8	<b>36.8</b>
7. PBW 702	03	33.4	37.3	43.8	24.5	35.3	<b>34.9</b>
8. PBW 703	02	31.2	41.7	45.3	26.2	45.4	<b>38.0</b>
9. HD 3139	01	45.1	45.8	47.9	31.5	38.8	<b>41.8</b>
10. DBW 128	07	31.3	40.7	46.1	25.6	34.8	<b>35.7</b>
<b>Mean</b>		<b>33.8</b>	<b>39.6</b>	<b>46.8</b>	<b>25.0</b>	<b>37.5</b>	<b>36.5</b>
<b>Rainfed, Timely Sown</b>							
1. PBW 644 (C)	03	35.1	-	49.8	-	33.4	<b>39.4</b>
2. WH 1080 (C)	04	26.1	-	40.7	-	31.5	<b>32.8</b>
3. PBW 660 (I)	01	36.1	-	50.9	-	39.6	<b>42.2</b>
4. PBW 706	05	32.4	-	40.2	-	47.9	<b>40.2</b>
5. WH 1164	02	35.7	-	52.1	-	40.7	<b>42.8</b>
<b>Mean</b>		<b>33.1</b>		<b>46.7</b>		<b>38.6</b>	<b>39.5</b>
<b>Restricted Irrigation Timely Sown</b>							
1. WH 1142	08	26.2	-	35.9	31.2	41.4	<b>33.7</b>
2. PBW 644 (C)	03	36.0	-	51.8	32.4	36.2	<b>39.1</b>
3. WH 1080 (C)	04	24.1	-	35.8	30.3	35.9	<b>31.5</b>
4. HD 3043 (C)	06	30.3	-	49.4	37.7	43.8	<b>40.3</b>
5. PBW 706	07	31.8	-	46.0	40.1	50.7	<b>42.2</b>
6. MP 1277	02	28.1	-	37.3	34.2	41.8	<b>35.4</b>
7. DBW 129	05	30.2	-	44.2	33.9	35.7	<b>36.0</b>
8. UAS 356	01	29.3	-	44.5	33.7	39.2	<b>36.7</b>
<b>Mean</b>		<b>29.5</b>		<b>42.9</b>	<b>34.3</b>	<b>40.8</b>	<b>36.9</b>

**Table 21: Zinc Content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's**

Variety	Code	Kanpur	Pusa	Sabour	Mean
<b>Irrigated, Timely Sown</b>					
1. K 0307 (C)	12	35.6	43.3	26.8	<b>35.2</b>
2. DBW 39 (C)	08	34.3	35.5	24.3	<b>35.2</b>
3. HD 2733 (C)	05	31.2	36.5	21.6	<b>31.4</b>
4. NW 5054 (I)	06	32.7	37.6	24.1	<b>29.8</b>
5. K 1006 (I)	13	32.8	40.7	25.2	<b>31.5</b>
6. HD 3127	02	34.5	37.4	26.1	<b>32.9</b>
7. HD 3128	04	37.9	42.9	25.3	<b>32.7</b>
8. PBW 677	11	36.0	43.0	24.9	<b>35.4</b>
9. PBW 693	03	34.0	45.8	28.4	<b>34.6</b>
10. WH 1132	07	32.1	37.9	24.6	<b>36.1</b>
11. HUW 661	10	36.0	33.0	22.5	<b>31.5</b>
12. DBW 98	01	28.7	36.9	20.5	<b>30.5</b>
13. UP 2855	09	37.7	48.5	24.2	<b>28.7</b>
<b>Mean</b>		<b>34.1</b>	<b>39.9</b>	<b>24.5</b>	<b>36.8</b>
<b>Irrigated, Late Sown</b>					
1. HD 3118	06	38.8	44.9	26.2	<b>36.6</b>
2. DBW 107	03	38.0	39.2	30.0	<b>35.7</b>
3. K 1114	08	30.5	34.2	23.4	<b>29.4</b>
4. NW 2036 (C)	13	37.1	45.9	24.8	<b>35.9</b>
5. DBW 14 (C)	12	35.0	39.7	22.4	<b>32.4</b>
6. HD 2985 (C)	01	33.5	36.0	21.9	<b>30.5</b>
7. HI 1563 (C)	09	35.1	43.7	24.4	<b>34.4</b>
8. HD 3139	05	31.2	40.0	22.8	<b>31.3</b>
9. DBW 126	11	33.7	36.4	24.9	<b>31.7</b>
10. PBW 701	02	34.9	43.8	25.1	<b>34.6</b>
11. PBW 702	10	32.5	36.4	24.7	<b>31.2</b>
12. PBW 704	07	36.2	38.8	26.5	<b>33.8</b>
13. HUW 677	04	36.3	39.9	24.8	<b>33.7</b>
<b>Mean</b>		<b>34.8</b>	<b>39.9</b>	<b>24.8</b>	<b>33.2</b>
<b>Rainfed, Timely Sown</b>					
1. BRW 3723	01	39.9	30.7	35.3	<b>35.3</b>
2. C 306 (C)	03	50.5	37.6	33.2	<b>40.4</b>
3. K 8027 (C)	05	56.9	39.5	36.6	<b>44.3</b>
4. HD 2888 (C)	04	57.5	41.0	35.8	<b>44.8</b>
5. HUW 679	02	53.2	37.1	35.2	<b>41.8</b>
6. UAS 356	06	41.3	33.3	30.3	<b>35.0</b>
		<b>49.9</b>	<b>36.5</b>	<b>34.4</b>	<b>40.3</b>

**Table 22: Zinc Content (ppm) of *T.aestivum* genotypes in Central Zone AVT's**

Variety		Code	Indore	Kota	Junagarh	P' Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	MP 3382	05	37.6	35.5	33.7	36.0	45.8	<b>37.7</b>
2.	GW 322 (C)	09	35.4	33.4	30.0	40.7	37.2	<b>35.3</b>
3.	HI 1544 (C)	10	37.7	36.0	29.5	41.0	35.4	<b>35.9</b>
4.	GW 451	03	40.1	32.6	27.8	36.4	40.4	<b>35.5</b>
5.	MACS 6604	07	37.0	26.7	29.6	31.6	37.7	<b>32.5</b>
<b>Mean</b>			<b>37.6</b>	<b>32.8</b>	<b>30.1</b>	<b>37.1</b>	<b>39.3</b>	<b>35.4</b>
<b>Irrigated, Late Sown</b>								
1.	MP 4010 (C)	05	35.1	37.1	31.5	37.8	35.9	<b>35.5</b>
2.	HD 2864 (C)	03	37.0	30.5	36.4	37.8	31.6	<b>34.7</b>
3.	HD 2932 (C)	01	32.1	25.8	31.4	32.7	31.7	<b>30.7</b>
4.	MP 3336 (C)	04	38.7	36.0	32.8	42.1	36.1	<b>37.1</b>
5.	GW 455	02	35.8	27.2	39.6	41.8	33.3	<b>35.5</b>
<b>Mean</b>			<b>35.7</b>	<b>31.3</b>	<b>34.3</b>	<b>38.4</b>	<b>33.7</b>	<b>34.7</b>
<b>Rainfed, Timely Sown</b>								
1.	NIAW 1885	08	51.4	30.4	-	-	-	<b>40.9</b>
2.	PBW 689	17	51.4	32.1	-	-	-	<b>41.8</b>
3.	WH 1142	01	40.1	21.5	-	-	-	<b>30.8</b>
4.	HI 1500 (C)	16	51.3	28.2	-	-	-	<b>39.8</b>
5.	MP 3288 (C)	15	50.1	30.7	-	-	-	<b>40.4</b>
6.	NIAW 2030	03	59.8	30.3	-	-	-	<b>45.1</b>
7.	MP 1279	11	54.9	28.1	-	-	-	<b>41.5</b>
8.	K 1215	04	55.8	32.5	-	-	-	<b>44.2</b>
9.	K 1217	02	58.2	23.3	-	-	-	<b>40.8</b>
10.	CG 1010	07	57.2	42.3	-	-	-	<b>49.8</b>
<b>Mean</b>			<b>53.0</b>	<b>29.9</b>	-	-	-	<b>41.5</b>
<b>Restricted Irrigation, Timely Sown</b>								
1.	DBW 110	03	44.9	37.7	-	-	-	<b>41.3</b>
2.	HI 1500 (C)	01	57.6	45.6	-	-	-	<b>51.6</b>
3.	MP 3288 (C)	02	43.6	35.8	-	-	-	<b>39.7</b>
4.	HI 8627 (C) (d)	04	44.8	41.2	-	-	-	<b>43.0</b>
5.	HD 3146	05	40.4	42.6	-	-	-	<b>41.5</b>
<b>Mean</b>			<b>46.3</b>	<b>40.6</b>	-	-	-	<b>43.4</b>

**Table 23: Zinc Content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's**

	Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	MACS 6222 (C)	02	41.2	45.9	37.2	<b>41.4</b>
2.	MACS 6478 (I)	04	38.2	40.0	29.5	<b>35.9</b>
3.	MACS 6604	07	35.9	39.1	28.4	<b>34.5</b>
	<b>Mean</b>		<b>38.4</b>	<b>41.7</b>	<b>31.7</b>	<b>37.3</b>
<b>Irrigated, Late Sown</b>						
1.	HD 2932 (C)	03	48.8	24.3	36.8	<b>36.6</b>
2.	Raj 4083 (C)	02	49.2	23.3	33.5	<b>35.3</b>
3.	HD 3090 (I)	04	50.7	27.5	33.3	<b>37.2</b>
4.	HUW 677	01	42.9	19.3	30.2	<b>30.8</b>
5.	UP 2864	05	48.0	25.4	35.6	<b>36.3</b>
6.	K 1213	06	40.4	25.2	36.2	<b>33.9</b>
	<b>Mean</b>		<b>46.7</b>	<b>24.2</b>	<b>34.3</b>	<b>35.0</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 347	09	-	32.6	-	<b>32.6</b>
2.	NIAW 1994	05	-	35.6	-	<b>35.6</b>
3.	NI 5439 (C)	02	-	43.8	-	<b>43.8</b>
4.	NIAW 1415 (C)	06	-	40.2	-	<b>40.2</b>
5.	NIAW 2030	01	-	35.9	-	<b>35.9</b>
	<b>Mean</b>		-	<b>37.6</b>	-	<b>37.6</b>

**Table 24: Zinc Content (ppm) of *T.aestivum* genotypes in Southern Hills Zone AVT's**

	Variety	Code	Wellington (TS)	Wellington (LS)	Ooty	Kodaikanal	Mean
<b>Restricted Irrigation, Timely Sown</b>							
1	CoW (W) 1 (C)	1	46.8	39.1	59.0	42.2	<b>46.8</b>
2	HW 2044 (C)	5	38.2	41.5	57.4	50.4	<b>46.9</b>
3	HW 5216 (C)	2	48.5	44.4	53.8	54.2	<b>50.2</b>
4	UAS 358	3	40.2	42.8	41.1	38.4	<b>40.6</b>
5	MACS 6507	4	41.9	42.8	51.2	46.9	<b>45.7</b>
	<b>Mean</b>		<b>43.1</b>	<b>42.1</b>	<b>52.5</b>	<b>46.4</b>	<b>46.0</b>

**Table 25: Protein Content (%) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	11.90	11.32	12.43	10.53	9.70	<b>11.18</b>
2. PDW 291 (C)	01	11.10	12.10	13.30	11.11	9.82	<b>11.49</b>
3. PDW 314 (C)	05	9.60	11.27	11.81	10.12	9.77	<b>10.51</b>
4. HD 2967 (C) (A)	03	10.20	12.15	13.13	12.13	12.05	<b>11.93</b>
5. HD 4730	02	10.33	11.11	12.11	11.20	10.13	<b>10.98</b>
<b>Mean</b>		<b>10.63</b>	<b>11.59</b>	<b>12.56</b>	<b>11.02</b>	<b>10.29</b>	<b>11.22</b>

**Table 26: Protein Content (%) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	10.05	10.81	12.16	10.11	12.41	<b>11.11</b>
2. HI 8737	01	9.23	10.77	12.05	11.43	12.36	<b>11.17</b>
3. HI 8498 (C)	11	10.23	11.91	12.33	11.91	12.53	<b>11.78</b>
4. MPO 1215 (C)	12	9.67	11.97	12.46	11.77	12.31	<b>11.64</b>
5. HI 8750	04	9.43	11.51	11.66	10.71	12.46	<b>11.15</b>
6. HD 4728	08	9.11	11.91	11.23	10.66	11.92	<b>10.97</b>
7. HD 4730	02	9.01	11.88	11.11	10.33	11.67	<b>10.80</b>
<b>Mean</b>		<b>9.53</b>	<b>11.54</b>	<b>11.86</b>	<b>10.99</b>	<b>12.24</b>	<b>11.23</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	13.10	10.67	-	-	-	<b>11.89</b>
2. A 9-30-1 (C)	14	13.31	10.53	-	-	-	<b>11.92</b>
3. HI 8755	09	14.11	11.11	-	-	-	<b>12.61</b>
4. MACS 3916	13	13.41	10.72	-	-	-	<b>12.07</b>
5. MACS 3927	10	12.36	10.95	-	-	-	<b>11.66</b>
6. UAS 451	12	13.41	10.67	-	-	-	<b>12.04</b>
7. DDW 30	05	13.53	10.59	-	-	-	<b>12.06</b>
<b>Mean</b>		<b>13.10</b>	<b>10.67</b>	-	-	-	<b>11.89</b>

**Table 27: Protein Content (%) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	11.61	12.67	11.97	<b>12.08</b>
2. UAS 428 (C)	01	12.05	13.61	11.47	<b>12.38</b>
3. HI 8750	03	11.57	12.77	12.11	<b>12.15</b>
4. DDW 27	05	11.11	12.81	11.23	<b>11.72</b>
<b>Mean</b>		<b>11.59</b>	<b>12.97</b>	<b>11.70</b>	<b>12.08</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 44	10	-	13.56	-	<b>13.56</b>
2. AKDW 2997-16 (C)	07	-	12.11	-	<b>12.11</b>
3. HI 8751	03	-	12.43	-	<b>12.43</b>
4. HI 8754	04	-	12.11	-	<b>12.11</b>
5. MACS 3927	08	-	12.96	-	<b>12.96</b>
<b>Mean</b>		-	<b>13.56</b>	-	<b>13.56</b>

**Table 28: Yellow Pigment Content (ppm) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety	Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>							
1. PDW 233 (C)	04	8.06	7.77	7.95	7.86	7.40	<b>7.81</b>
2. PDW 291 (C)	01	5.66	5.46	5.13	5.12	5.73	<b>5.42</b>
3. PDW 314 (C)	05	5.40	4.60	4.62	4.67	5.61	<b>4.98</b>
4. HD 2967 (C) (A)	03	3.99	2.81	2.39	2.81	3.33	<b>3.07</b>
5. HD 4730	02	5.78	5.87	6.25	5.95	5.95	<b>5.96</b>
<b>Mean</b>		<b>5.78</b>	<b>5.30</b>	<b>5.27</b>	<b>5.28</b>	<b>5.60</b>	<b>5.45</b>

**Table 29: Yellow Pigment Content (ppm) of *T. durum* genotypes in Central Zone AVT's**

Variety	Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>							
1. HI 8736	06	5.44	4.95	5.41	4.67	5.14	<b>5.12</b>
2. HI 8737	01	5.67	5.26	6.67	5.46	6.17	<b>5.85</b>
3. HI 8498 (C)	11	4.53	4.81	4.22	4.79	4.79	<b>4.63</b>
4. MPO 1215 (C)	12	5.39	4.81	5.27	4.76	4.93	<b>5.03</b>
5. HI 8750	04	5.05	5.68	5.28	5.88	5.82	<b>5.54</b>
6. HD 4728	08	6.18	6.06	5.82	6.06	6.29	<b>6.08</b>
7. HD 4730	02	6.46	5.86	6.24	6.41	6.06	<b>6.21</b>
<b>Mean</b>		<b>5.53</b>	<b>5.35</b>	<b>5.56</b>	<b>5.43</b>	<b>5.60</b>	<b>5.49</b>
<b>Rainfed, Timely Sown</b>							
1. HI 8627 (C)	06	6.73	6.21	-	-	-	<b>6.47</b>
2. A 9-30-1 (C)	14	3.85	4.13	-	-	-	<b>3.99</b>
3. HI 8755	09	4.55	5.47	-	-	-	<b>5.01</b>
4. MACS 3916	13	4.67	5.55	-	-	-	<b>5.11</b>
5. MACS 3927	10	4.67	5.18	-	-	-	<b>4.93</b>
6. UAS 451	12	5.02	5.44	-	-	-	<b>5.23</b>
7. DDW 30	05	6.06	6.10	-	-	-	<b>6.08</b>
<b>Mean</b>		<b>5.08</b>	<b>5.44</b>	-	-	-	<b>5.26</b>

**Table 30: Yellow Pigment Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety	Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>					
1. NIDW 295 (C)	06	5.54	6.25	6.41	<b>6.07</b>
2. UAS 428 (C)	01	6.08	5.76	6.09	<b>5.98</b>
3. HI 8750	03	4.93	5.25	5.14	<b>5.11</b>
4. DDW 27	05	5.75	6.19	5.97	<b>5.97</b>
<b>Mean</b>		<b>5.58</b>	<b>5.86</b>	<b>5.90</b>	<b>5.78</b>
<b>Rainfed, Timely Sown</b>					
1. UAS 446	10	-	5.40	-	<b>5.40</b>
2. AKDW 2997-16 (C)	07	-	3.71	-	<b>3.71</b>
3. HI 8751	03	-	4.22	-	<b>4.22</b>
4. HI 8754	04	-	4.94	-	<b>4.94</b>
5. MACS 3927	08	-	4.74	-	<b>4.74</b>
<b>Mean</b>		-	<b>4.60</b>	-	<b>4.60</b>



**Table 31: Iron Content (ppm) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety		Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>								
1.	PDW 233 (C)	04	34.0	29.4	37.0	38.5	35.4	<b>34.9</b>
2.	PDW 291 (C)	01	35.0	35.3	42.2	40.8	41.5	<b>39.0</b>
3.	PDW 314 (C)	05	30.2	32.7	39.0	41.5	39.7	<b>36.6</b>
4.	HD 2967 (C) (A)	03	32.6	36.2	39.8	42.8	38.3	<b>37.9</b>
5.	HD 4730	02	36.3	37.0	37.7	47.5	39.0	<b>39.5</b>
<b>Mean</b>			<b>33.6</b>	<b>34.1</b>	<b>39.1</b>	<b>42.2</b>	<b>38.8</b>	<b>37.6</b>

**Table 32: Iron Content (ppm) of *T. durum* genotypes in Central Zone AVT's**

Variety		Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	HI 8736	06	35.6	41.2	42.8	36.5	37.0	<b>38.6</b>
2.	HI 8737	01	35.8	37.4	46.8	36.8	35.5	<b>38.5</b>
3.	HI 8498 (C)	11	36.9	45.0	37.9	40.6	36.9	<b>39.5</b>
4.	MPO 1215 (C)	12	35.4	39.1	41.0	37.5	35.7	<b>37.7</b>
5.	HI 8750	04	37.0	36.7	33.4	34.2	40.0	<b>36.3</b>
6.	HD 4728	08	35.0	48.0	39.3	38.7	38.9	<b>40.0</b>
7.	HD 4730	02	34.9	42.1	41.7	37.7	38.0	<b>38.9</b>
<b>Mean</b>			<b>35.8</b>	<b>41.4</b>	<b>40.4</b>	<b>37.4</b>	<b>37.4</b>	<b>38.5</b>
<b>Rainfed, Timely Sown</b>								
1.	HI 8627 (C)	06	45.3	34.5	-	-	-	<b>39.9</b>
2.	A 9-30-1 (C)	14	53.5	39.3	-	-	-	<b>46.4</b>
3.	HI 8755	09	47.6	40.4	-	-	-	<b>44.0</b>
4.	MACS 3916	13	46.9	36.3	-	-	-	<b>41.6</b>
5.	MACS 3927	10	43.5	45.8	-	-	-	<b>44.7</b>
6.	UAS 451	12	50.2	38.9	-	-	-	<b>44.6</b>
7.	DDW 30	05	46.9	36.1	-	-	-	<b>41.5</b>
<b>Mean</b>			<b>47.7</b>	<b>38.8</b>	-	-	-	<b>43.2</b>

**Table 33: Iron Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety		Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	NIDW 295 (C)	06	37.8	36.8	35.7	<b>36.8</b>
2.	UAS 428 (C)	01	40.8	43.1	41.8	<b>41.9</b>
3.	HI 8750	03	35.3	37.7	41.0	<b>38.0</b>
4.	DDW 27	05	37.3	37.4	38.5	<b>37.7</b>
<b>Mean</b>			<b>37.8</b>	<b>38.8</b>	<b>39.3</b>	<b>38.6</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 446	10	-	43.0	-	<b>43.0</b>
2.	AKDW 2997-16 (C)	07	-	43.1	-	<b>43.1</b>
3.	HI 8751	03	-	46.1	-	<b>46.1</b>
4.	HI 8754	04	-	47.2	-	<b>47.2</b>
5.	MACS 3927	08	-	45.2	-	<b>45.2</b>
<b>Mean</b>			-	<b>44.9</b>	-	<b>44.9</b>

**Table 34: Zinc Content (ppm) of *T. durum* genotypes in North Western Plains Zone AVT's**

Variety		Code	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
<b>Irrigated, Timely Sown</b>								
1.	PDW 233 (C)	04	34.1	39.4	53.6	28.3	31.5	<b>37.4</b>
2.	PDW 291 (C)	01	30.9	44.2	51.9	32.5	39.6	<b>39.8</b>
3.	PDW 314 (C)	05	29.4	45.2	56.4	30.5	47.9	<b>41.9</b>
4.	HD 2967 (C) (A)	03	23.2	40.1	43.8	26.2	33.4	<b>33.3</b>
5.	HD 4730	02	29.7	45.0	53.6	28.9	40.7	<b>39.6</b>
<b>Mean</b>			<b>29.5</b>	<b>42.8</b>	<b>51.9</b>	<b>29.3</b>	<b>38.6</b>	<b>38.4</b>

**Table 35: Zinc Content (ppm) of *T. durum* genotypes in Central Zone AVT's**

Variety		Code	Indore	Kota	Junagarh	P'Kheda	Vijapur	Mean
<b>Irrigated, Timely Sown</b>								
1.	HI 8736	06	39.5	36.9	34.6	40.1	48.0	<b>39.8</b>
2.	HI 8737	01	40.1	35.1	35.6	46.0	43.1	<b>40.0</b>
3.	HI 8498 (C)	11	41.3	36.2	27.2	46.9	49.4	<b>40.2</b>
4.	MPO 1215 (C)	12	40.8	34.6	33.3	45.4	45.4	<b>39.9</b>
5.	HI 8750	04	42.4	32.3	30.1	37.5	47.7	<b>38.0</b>
6.	HD 4728	08	32.6	33.0	35.5	39.8	39.9	<b>36.2</b>
7.	HD 4730	02	35.5	33.2	32.5	42.0	43.3	<b>37.3</b>
<b>Mean</b>			<b>38.9</b>	<b>34.5</b>	<b>32.7</b>	<b>42.5</b>	<b>45.3</b>	<b>38.8</b>
<b>Rainfed, Timely Sown</b>								
1.	HI 8627 (C)	06	55.5	28.8	-	-	-	<b>42.2</b>
2.	A 9-30-1 (C)	14	59.1	30.5	-	-	-	<b>44.8</b>
3.	HI 8755	09	57.4	31.0	-	-	-	<b>44.2</b>
4.	MACS 3916	13	53.5	32.5	-	-	-	<b>43.0</b>
5.	MACS 3927	10	52.9	35.7	-	-	-	<b>44.3</b>
6.	UAS 451	12	55.9	31.6	-	-	-	<b>43.8</b>
7.	DDW 30	05	57.1	25.9	-	-	-	<b>41.5</b>
<b>Mean</b>			<b>55.9</b>	<b>30.9</b>	-	-	-	<b>43.4</b>

**Table 36: Zinc Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's**

Variety		Code	Pune	Dharwad	Niphad	Mean
<b>Irrigated, Timely Sown</b>						
1.	NIDW 295 (C)	06	41.0	38.3	32.5	<b>37.3</b>
2.	UAS 428 (C)	01	43.2	44.7	32.3	<b>40.1</b>
3.	HI 8750	03	41.4	45.5	35.3	<b>40.7</b>
4.	DDW 27	05	42.4	39.5	35.4	<b>39.1</b>
<b>Mean</b>			<b>42.0</b>	<b>42.0</b>	<b>33.9</b>	<b>39.3</b>
<b>Rainfed, Timely Sown</b>						
1.	UAS 446	10	-	39.6	-	<b>39.6</b>
2.	AKDW 2997-16 (C)	07	-	46.9	-	<b>46.9</b>
3.	HI 8751	03	-	36.2	-	<b>36.2</b>
4.	HI 8754	04	-	46.8	-	<b>46.8</b>
5.	MACS 3927	08	-	44.4	-	<b>44.4</b>
<b>Mean</b>			-	<b>42.8</b>	-	<b>42.8</b>

# **SECTION G**

## **INITIATIVE FOR WHEAT EXPORT**

**(Analysis of FCI Wheat Samples)**

- i. Punjab**
- ii. Haryana**
- iii. Madhya Pradesh**

## Quality Analysis Report of Wheat Samples from Food Corporation of India

About one hundred and fifty million tons of wheat is traded every year throughout the world. The share of export from India is very small and inconsistent. India achieved wheat production of 95.82 million tons in the year 2013-14 and is the second largest producer of wheat in the world for last more than a decade. In spite of repeated draught and several other unforeseen reasons the production is more than 90.0 million tones. This shows the inherent strength and resilient nature of wheat programme in the country. This could be made possible by developing high yielding, disease resistant wheat varieties and adopting matching production technologies. Considering the production level, India can emerge as a major player for wheat export. Wheat quality needs uppermost attention in the time to come to meet the trade requirements of domestic and international market.

Three species of wheat namely, *T.aestivum*, *T.durum* and *T.dicoccum* are cultivated in the country. Bread wheat is contributing approximately 95 % while around 4% comes from durum wheat and just about 1% is the share of *dicoccum* wheat to the total wheat production. The quality requirements of wheat for various products like chapati, bread, biscuit and pasta are different. Hard wheat (*T.aestivum*) with strong & extensible gluten and high protein is required for making good bread. For biscuit, the quality requirements are soft wheat, low protein and weak & extensible gluten. For chapati, we need hard wheat, medium to high protein and medium & extensible gluten. For pasta products, hard wheat (*T.durum*) with strong gluten, high protein, low yellow berry incidence and high  $\beta$ -carotene content are required.

The wheat is traded based on classes and grades. Hence, all the major wheat exporting nations like U.S.A, Canada, Australia and Argentina have graded and classified their wheat. Grades are based on the physical quality of the wheat and include parameters like test weight, foreign matter, broken & shrunken kernel, total defect and other classes. Classes are based on the functional quality of the wheat and signifies the product specificity of a given wheat lot. For example, wheat in U.S.A has been divided into 6 classes and 6 grades. To classify and grade the Indian wheat in a systematic manner, it is necessary to have an in depth knowledge of quality of wheat grain samples from the stocks of Food Corporation of India (FCI) throughout the country. An exercise had been undertaken during 2012-13 to analyse wheat grain samples from FCI stocks for grading or physical parameters and also for non-grading or chemical or functional parameters. Based on the quality data generated on about 5500 wheat grain samples, Food Corporation of India could export about 4.50 million tonnes of wheat through its exporting agencies during 2012-13.

## **Collection of wheat grain samples and their quality analysis**

During 2013-14, Two thousand two hundred fifty one (2251) wheat grain samples (500 g each) were collected by FCI officials from their stocks covering 3 major wheat growing states viz. Punjab (857 samples), Haryana (345 samples) and Madhya Pradesh (1049 samples). These samples were sent to Quality Laboratory, Directorate of Wheat Research, Karnal and analyzed for various wheat grading or physical parameters like test weight, damaged kernel, foreign matter, shrivelled & broken kernel, total defects & other classes and wheat non- grading or functional or chemical parameters like protein, moisture, wet gluten and falling no.

**Grading Parameters:** These parameters explain the physical purity of wheat lot. Higher value of test weight and lower values of all other parameters i.e. damaged kernel, foreign matter, shrunken 8, broken kernel, total defects & other classes are desirable and fetch higher price in the international market.

**Test Weight:** It is an important parameter for millers as it is positively correlated with flour recovery. In U.S. system of grain trading, bread wheat with 76.4 kg/hl and above test weight is classified in grade 1. In Canadian system, the threshold value is 78.0 kg/hl.

**Protein Content:** It is an important parameter for making different products of bread wheat. For making good quality bread, chapatti and biscuit, the protein requirements are >12.0%, 10.0-13.0% and <10.0% respectively. The genetic heritability is about 0.50, hence it is highly influenced by agroclimatic conditions.

**Wet Gluten:** It is associated with the quality of end products of wheat. Higher values are desirable for making bread.

**Falling Number:** This quality parameter gives a measure of alpha-amylase activity. More is the value of falling no. means less alpha amylase activity. The falling number values more than 300 – 400 seconds is considered desirable in the international market.

### CHEMICAL QUALITY PARAMETERS OF WHEAT IN HARYANA

Sr. No.	Name of District	No. of Samples	Protein Content (as is basis)		Moisture Content (%)		Wet Gluten (%)		Falling No. (Seconds)	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Bhiwani	28	12.6	(11.9-13.2)	11.5	(10.6-11.9)	27.1	(25.8-28.4)	512	(485-553)
2.	Fatehabad	40	12.0	(11.2-12.8)	11.6	(10.6-13.5)	26.0	(23.6-27.7)	521	(427-583)
3.	Hisar	39	12.5	(11.6-13.2)	12.1	(11.0-13.6)	27.0	(24.5-28.6)	522	(440-597)
4.	Kaithal	46	12.3	(11.7-12.9)	12.4	(11.2-13.9)	26.6	(25.4-27.8)	470	(433-569)
5.	Karnal	96	12.2	(11.5-13.1)	11.8	(11.2-12.4)	26.3	(24.6-28.3)	486	(426-568)
6.	Kurukshetra	50	12.2	(11.0-13.0)	11.7	(11.2-12.5)	26.4	(23.1-28.2)	495	(467-539)
7.	Panipat	10	12.4	(12.0-12.7)	13.1	(12.8-13.3)	26.9	(26.0-27.9)	423	(408-438)
8.	Sirsa	36	12.5	(11.9-13.1)	12.0	(11.2-13.5)	26.8	(25.7-28.2)	513	(452-576)
<b>Overall Haryana</b>		<b>345</b>	<b>12.3</b>	<b>(11.0-13.2)</b>	<b>11.9</b>	<b>(10.6-13.9)</b>	<b>26.5</b>	<b>(23.1-28.6)</b>	<b>496</b>	<b>(408-597)</b>

**PHYSICAL QUALITY PARAMETERS OF WHEAT IN HARYANA**

Sr. No.	Name of District	No. of Samples	Test Weight (kg/hl)		Damaged Kernel (%)		Shrivelled & Broken Kernel (%)		Foreign Matter (%)		Total Defect (%)		Other Classes	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Bhiwani	28	77.5	76.0-79.6	0.753	0.000-2.195	4.867	2.460-6.427	0.155	0.030-0.380	5.776	2.733-8.460	1.000	0.136-3.053
2.	Fatehabad	40	78.8	77.0-82.3	0.535	0.000-2.544	4.966	3.746-6.972	0.099	0.000-0.414	5.601	4.233-7.353	0.269	0.000-0.645
3.	Hisar	39	77.9	74.7-81.2	0.665	0.000-2.215	5.057	2.353-7.192	0.128	0.000-0.360	5.850	2.665-8.259	0.793	0.049-2.940
4.	Kaithal	46	78.2	77.0-79.6	0.419	0.000-1.624	5.329	3.599-8.200	0.087	0.000-0.438	5.836	4.248-8.430	0.424	0.065-1.234
5.	Karnal	96	78.2	76.0-80.0	0.444	0.000-1.934	4.759	1.168-8.568	0.131	0.007-0.798	5.334	1.441-9.218	0.338	0.000-1.010
6.	Kurukshetra	50	78.5	75.3-80.3	0.422	0.000-1.363	4.288	1.892-6.506	0.134	0.008-1.008	4.845	2.249-7.122	0.311	0.000-2.504
7.	Panipat	10	78.1	77.0-80.0	1.452	0.000-4.113	3.886	2.636-5.288	0.137	0.030-0.297	5.475	3.461-7.906	0.269	0.014-0.490
8.	Sirsa	36	78.4	76.1-81.9	0.522	0.000-2.567	4.497	2.847-5.812	0.107	0.016-0.235	5.126	3.370-7.410	0.321	0.000-0.983
<b>Overall Haryana</b>		<b>345</b>	<b>78.3</b>	<b>(74.7-82.3)</b>	<b>0.536</b>	<b>(0.000-4.113)</b>	<b>4.781</b>	<b>(1.168-8.568)</b>	<b>0.121</b>	<b>(0.000-1.008)</b>	<b>5.438</b>	<b>(1.441-9.218)</b>	<b>0.439</b>	<b>(0.000-3.053)</b>

### CHEMICAL QUALITY PARAMETERS OF WHEAT IN PUNJAB

Sr. No.	Name of District	No. of Samples	Protein Content (as is basis)		Moisture Content (%)		Wet Gluten (%)		Falling No. (Seconds)	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Amritsar	23	12.0	(11.5-12.6)	13.4	(12.7-14.1)	25.9	(24.5-26.8)	524	(464-554)
2.	Bathinda	36	12.0	(11.2-13.1)	12.3	(11.2-13.1)	26.0	(23.4-27.9)	449	(401-529)
3.	Faridkot	96	12.3	(10.9-13.4)	11.8	(10.3-13.6)	26.4	(23.4-28.9)	523	(407-640)
4.	Fatehgarh Sahib	18	12.3	(11.4-13.1)	13.0	(11.1-13.9)	26.6	(24.4-28.4)	414	(341-475)
5.	Fazilka	23	12.4	(11.8-13.1)	11.2	(10.4-11.7)	26.7	(25.5-28.3)	530	(454-562)
6.	Ferozepur	75	12.4	(11.7-13.4)	11.8	(10.0-13.1)	26.6	(25.3-28.7)	499	(419-610)
7.	Gurdaspur	23	12.0	(11.6-12.4)	11.9	(11.4-12.5)	26.1	(24.7-26.7)	482	(427-517)
8.	Hoshiarpur	18	11.9	(11.3-12.5)	13.3	(12.8-13.7)	25.6	(24.1-26.5)	515	(482-569)
9.	Jalandhar	19	12.3	(11.6-13.1)	12.9	(12.4-13.5)	26.4	(25.1-27.8)	509	(472-533)
10.	Kapurthala	16	12.1	(11.6-13.0)	13.3	(12.7-13.8)	26.1	(24.1-28.1)	513	(480-533)
11.	Ludhiana	108	12.5	(10.6-13.3)	11.7	(10.4-13.4)	26.9	(22.2-28.7)	477	(387-557)
12.	Mansa	74	12.7	(11.8-13.5)	11.6	(10.0-13.5)	27.0	(25.7-28.6)	525	(482-595)
13.	Moga	35	12.3	(11.7-13.0)	12.8	(12.1-13.8)	26.7	(25.2-28.1)	479	(440-510)
14.	Muktsar	61	12.5	(11.1-13.3)	11.3	(10.2-12.3)	26.8	(23.4-28.6)	546	(454-631)
15.	Nabha	4	12.1	(11.7-12.6)	13.5	(13.1-13.8)	26.2	(25.0-27.3)	466	(466-466)
16.	Nawanshahar	5	12.5	(11.8-12.9)	13.2	(12.9-13.5)	26.6	(25.8-27.4)	485	(483-487)
17.	Patiala	116	12.6	(11.6-13.8)	12.0	(10.4-13.4)	27.0	(24.4-29.6)	494	(361-627)
18.	Ropar	6	12.7	(12.3-13.2)	11.3	(10.7-12.4)	27.1	(26.5-27.6)	520	(483-567)
19.	Sangrur	92	12.5	(11.6-13.5)	11.8	(10.8-12.9)	27.0	(24.7-28.7)	494	(417-570)
20.	Mohali	5	12.3	(11.8-12.7)	13.5	(13.1-13.9)	26.4	(25.7-27.0)	446	(415-467)
21.	TaranTaran	4	12.1	(11.9-12.3)	13.7	(13.6-13.7)	26.1	(25.9-26.4)	460	(460-460)
<b>Overall Punjab</b>		<b>857</b>	<b>12.4</b>	<b>(10.6-13.8)</b>	<b>12.0</b>	<b>(10.0-14.1)</b>	<b>26.7</b>	<b>(22.2-29.6)</b>	<b>500</b>	<b>(341-640)</b>



**PHYSICAL QUALITY PARAMETERS OF WHEAT IN PUNJAB**

Sr. No.	Name of District	No. of Samples	Test Weight (kg/hl)		Damaged Kernel (%)		Shrivelled & Broken Kernel (%)		Foreign Matter (%)		Total Defect (%)		Other Classes	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Amritsar	23	77.8	(75.4-80.3)	0.852	(0.313-1.329)	3.836	(1.993-6.322)	0.145	(0.000-0.720)	4.834	(2.540 – 7.326)	0.150	(0.000-0.589)
2.	Bathinda	36	78.1	(76.5-80.5)	0.819	(0.000-3.046)	3.438	(2.056-5.195)	0.046	(0.000-0.172)	4.251	(2.696- 7.007)	0.198	(0.000-1.850)
3.	Faridkot	96	78.4	(75.2-80.1)	0.631	(0.000-4.288)	4.331	(1.452-11.054)	0.074	(0.000-0.582)	5.021	(1.725-12.918)	0.233	(0.000-2.209)
4.	Fatehgarh Sahib	18	78.2	(76.7-79.6)	2.284	(0.000-10.338)	5.012	(2.555-8.154)	0.074	(0.000-0.179)	7.370	(4.030-15.189)	0.084	(0.000-0.313)
5.	Fazilka	23	78.4	(74.9-80.3)	0.155	(0.000-0.541)	4.211	(1.400-7.539)	0.102	(0.007-0.393)	4.468	(1.445-7.666)	0.323	(0.000-2.788)
6.	Ferozepur	75	77.9	(75.3-80.4)	0.644	(0.000-4.960)	4.335	(1.422-7.246)	0.110	(0.000-1.079)	5.080	(1.686-10.072)	0.362	(0.000-2.284)
7.	Gurdaspur	23	77.8	(75.1-79.4)	0.561	(0.155-1.337)	5.430	(3.611-6.908)	0.073	(0.020-0.145)	6.064	(4.235-7.534)	0.604	(0.042-1.580)
8.	Hoshiarpur	18	79.3	(78.5-80.8)	1.057	(0.488-1.528)	3.807	(2.951-5.867)	0.012	(0.000-0.068)	4.664	(1.042-7.459)	0.126	(0.000-0.363)
9.	Jalandhar	19	78.9	(76.8-81.3)	1.455	(0.226-4.084)	3.417	(1.030-6.605)	0.049	(0.000-0.112)	4.920	(2.182-5.174)	0.203	(0.000-0.736)
10.	Kapurthala	16	77.8	(76.9-78.7)	1.598	(0.254-4.367)	3.949	(2.393-6.500)	0.057	(0.000-0.135)	5.604	(2.982-10.673)	0.182	(0.022-0.406)
11.	Ludhiana	108	78.6	(75.3-81.3)	0.471	(0.000-3.942)	4.088	(0.241-8.674)	0.072	(0.000-0.351)	4.624	(0.992-10.163)	0.107	(0.000-1.225)
12.	Mansa	74	78.0	(75.0-81.0)	0.350	(0.000-1.745)	4.147	(1.577-7.149)	0.059	(0.000-0.388)	4.532	(1.780-7.896)	0.621	(0.000-2.497)
13.	Moga	35	78.1	(76.9-79.9)	3.783	(0.388-9.520)	3.344	(2.280-5.458)	0.066	(0.000-0.415)	7.193	(3.704-13.022)	0.087	(0.000-0.323)
14.	Muktsar	61	78.3	(75.7-80.6)	0.184	(0.000-0.647)	4.138	(1.068-8.570)	0.053	(0.000-0.454)	4.375	(1.198-8.726)	0.149	(0.000-1.341)
15.	Nabha	4	78.5	(78.2-78.7)	1.056	(0.000-3.376)	3.978	(2.967-4.776)	0.039	(0.025-0.067)	5.073	(3.606-8.219)	0.224	(0.000-0.331)
16.	Nawanshahar	5	78.7	(78.2-79.2)	0.784	(0.180-1.857)	3.871	(3.156-4.561)	0.059	(0.000-1.195)	4.714	(3.669-6.439)	0.171	(0.073-0.220)
17.	Patiala	116	78.4	(75.6-80.7)	0.780	(0.000-3.216)	4.667	(1.536-11.753)	0.064	(0.000-0.416)	5.516	(1.915-12.918)	0.305	(0.000-3.545)
18.	Ropar	6	80.0	(76.7-81.9)	2.194	(0.120-4.715)	4.639	(3.182-7.300)	0.049	(0.000-0.121)	6.882	(4.458-12.031)	0.038	(0.000-0.157)
19.	Sangrur	92	78.7	(77.3-80.4)	1.051	(0.000-4.905)	4.721	(2.554-7.760)	0.083	(0.000-0.315)	5.831	(3.167-10.915)	0.313	(0.000-1.007)
20.	Mohali	5	78.2	(76.7-79.0)	1.590	(1.109-2.336)	3.719	(2.963-4.534)	0.024	(0.012-0.057)	5.333	(4.204-6.509)	0.237	(0.023-0.600)
21.	TaranTaran	4	77.6	(77.3-78.0)	0.813	(0.736-0.882)	3.969	(2.843-5.849)	0.192	(0.087-0.353)	4.974	(3.921-7.013)	0.210	(0.058-0.343)
<b>Overall Punjab</b>		<b>857</b>	<b>78.3</b>	<b>(74.9-81.9)</b>	<b>0.859</b>	<b>(0.000-10.828)</b>	<b>4.262</b>	<b>(0.241-11.753)</b>	<b>0.073</b>	<b>(0.000-1.079)</b>	<b>5.170</b>	<b>(0.992-15.189)</b>	<b>0.268</b>	<b>0.000-3.545</b>

### CHEMICAL QUALITY PARAMETERS OF WHEAT IN MADHYA PRADESH

Sr. No.	Name of District	No. of Samples	Protein Content (as is basis)		Moisture Content (%)		Wet Gluten (%)		Falling No. (Seconds)	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Bhopal	442	12.4	(10.4-13.6)	12.5	(9.7-14.1)	26.8	(21.8-29.2)	525	(433-633)
2.	Gwalior	162	12.0	(11.0-12.9)	12.5	(10.2-13.5)	25.9	(23.1-28.1)	513	(441-573)
3.	Indore	108	13.0	(11.3-13.7)	12.2	(10.2-12.9)	27.9	(23.4-29.5)	520	(420-558)
4.	Jabalpur	38	12.8	(11.5-13.9)	12.4	(10.7-13.8)	27.5	(24.3-30.1)	504	(378-575)
5.	Sagar	78	11.5	(10.6-12.8)	12.6	(11.4-13.6)	24.5	(22.2-27.7)	510	(474-553)
6.	Ujjain	442	12.7	(11.3-13.7)	12.8	(11.4-14.0)	27.4	(24.0-29.5)	512	(346-585)
<b>Overall MP</b>		<b>1049</b>	<b>12.4</b>	<b>(10.4-13.9)</b>	<b>12.5</b>	<b>(9.7-14.1)</b>	<b>26.7</b>	<b>(21.8-30.1)</b>	<b>518</b>	<b>(346-633)</b>

### PHYSICAL QUALITY PARAMETERS OF WHEAT IN MADHYA PRADESH

Sr. No.	Name of District	No. of Samples	Test Weight (kg/hl)		Damaged Kernel (%)		Shrivelled & Broken Kernel (%)		Foreign Matter (%)		Total Defect (%)		Other Classes	
			Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
1.	Bhopal	442	78.3	(74.0-81.2)	1.601	(0.000-7.172)	5.145	(1.482-8.348)	0.386	(0.000-2.481)	7.071	(1.702-12.295)	0.231	(0.000-2.071)
2.	Gwalior	162	78.8	(75.4-81.8)	0.362	(0.000-2.227)	4.556	(0.536-7.164)	0.288	(0.057-1.150)	5.206	(0.983-8.367)	0.564	(0.000-1.706)
3.	Indore	108	79.1	(75.8-82.2)	0.383	(0.000-3.557)	3.898	(1.402-7.363)	0.505	(0.106-1.703)	4.786	(1.917-11.291)	0.155	(0.000-0.857)
4.	Jabalpur	38	78.0	(74.5-80.2)	2.141	(0.000-6.437)	3.137	(0.665-5.686)	0.422	(0.000-1.056)	5.700	(2.485-9.722)	0.239	(0.000-1.492)
5.	Sagar	78	78.4	(75.0-80.5)	1.220	(0.000-4.835)	3.300	(0.758-6.072)	0.325	(0.000-1.050)	4.830	(1.167-9.578)	0.717	(0.057-2.474)
6.	Ujjain	442	78.9	(76.3-81.6)	1.385	(0.000-6.008)	3.516	(0.412-7.123)	0.440	(0.075-1.994)	5.335	(1.049-9.915)	0.323	(0.000-1.140)
<b>Overall MP</b>		<b>1049</b>	<b>78.6</b>	<b>(74.0-82.2)</b>	<b>1.230</b>	<b>(0.000-7.172)</b>	<b>4.372</b>	<b>(0.412-8.348)</b>	<b>0.391</b>	<b>(0.000-2.481)</b>	<b>5.966</b>	<b>(0.983-12.295)</b>	<b>0.330</b>	<b>(0.000-0.474)</b>

**Frequency Distribution of Physical Quality Parameters in Wheat Grain Samples from Food Corporation of India**

Sr. No.	Distribution Level	Punjab	Haryana	Madhya Pradesh	Overall
<b>Test Weight (Kg/hl)</b>					
1.	<74.0	0.00	0.00	0.00	0.00
2.	74.0-76.0	2.45	2.32	3.34	2.84
3.	76.1-78.0	35.01	44.06	28.79	33.50
4.	78.1-80.0	57.29	49.86	58.15	56.55
5.	>80.0	5.25	3.77	9.72	7.11
<b>Damaged Kernel (%)</b>					
1.	<1.000	74.45	87.25	60.63	69.97
2.	1.000-3.000	19.95	11.88	22.50	19.90
3.	3.001-5.000	4.32	0.87	16.02	9.24
4.	5.001-7.000	0.82	0.00	0.76	0.67
5.	>7.000	0.47	0.00	0.10	0.22
<b>Shrivelled &amp; Broken Kernel (%)</b>					
1.	<1.000	0.12	0.00	1.14	0.58
2.	1.000-3.000	17.62	5.51	19.26	16.53
3.	3.001-5.000	56.24	53.33	43.18	49.71
4.	5.001-7.000	20.77	38.26	33.65	29.45
5.	>7.000	5.25	2.90	2.76	3.73
<b>Foreign Matter (%)</b>					
1.	<0.500	99.53	99.42	76.93	88.98
2.	0.500-1.000	0.35	0.29	19.45	9.24
3.	1.001-2.000	0.12	0.29	3.43	1.69
4.	2.001-4.000	0.00	0.00	0.19	0.09
5.	>4.000	0.00	0.00	0.00	0.00
<b>Total Defect (%)</b>					
1.	<1.000	0.12	0.00	0.10	0.09
2.	1.000-3.000	8.17	2.90	7.44	7.02
3.	3.001-5.000	45.27	34.49	25.64	34.47
4.	5.001-7.000	32.09	52.75	36.51	37.32
5.	>7.000	14.35	9.86	30.31	21.10
<b>Other Classes (%)</b>					
1.	<0.500	88.45	73.04	79.89	82.10
2.	0.500-1.000	5.60	18.26	16.49	12.62
3.	1.001-2.000	4.43	7.25	3.24	4.31
4.	2.001-4.000	1.52	1.45	0.38	0.98
5.	>4.000	0.00	0.00	0.00	0.00

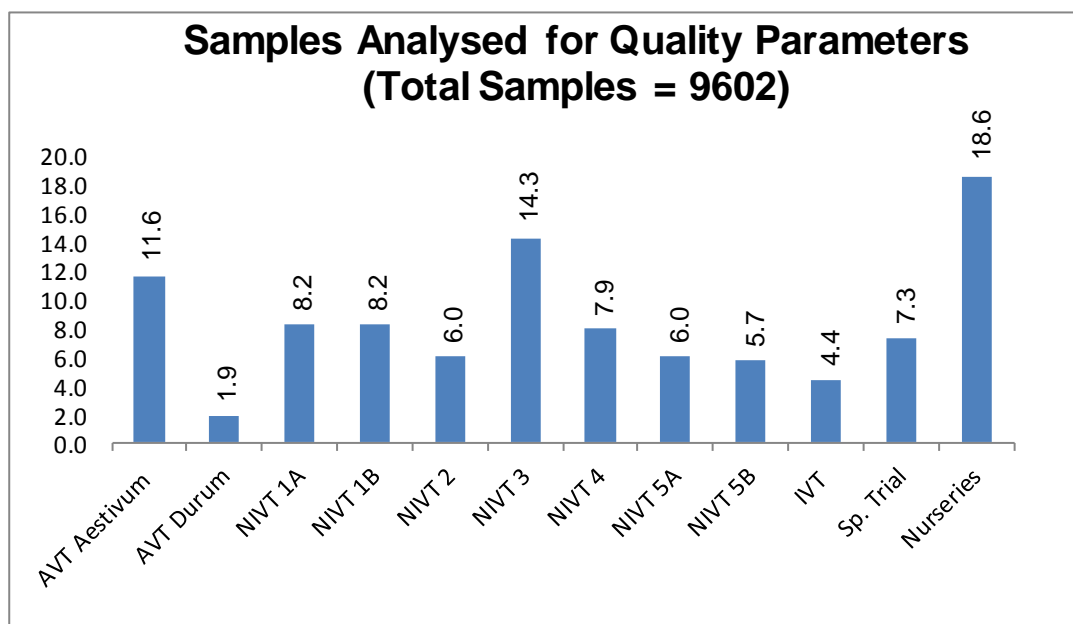
**Frequency Distribution of Chemical or Functional Quality Parameters in Wheat Grain Samples from Food Corporation of India**

Sr. No.	Distribution Level	Punjab	Haryana	Madhya Pradesh	Overall
<b>Protein Content (%)</b>					
1.	<10.0	0.00	0.00	0.00	0.00
2.	10.0-11.0	0.23	0.29	1.43	0.80
3.	11.1-12.0	23.92	25.80	25.74	25.06
4.	12.1-13.0	67.09	70.72	60.53	64.59
5.	>13.0	8.75	3.19	12.30	9.55
<b>Moisture Content (%)</b>					
1.	<10.0	0.00	0.00	0.38	0.18
2.	10.0-11.0	12.37	4.64	6.77	8.57
3.	11.1-12.0	48.31	68.12	12.96	34.87
4.	12.1-13.0	24.74	15.36	54.24	37.05
5.	>13.0	14.59	11.88	25.64	19.32
<b>Wet Gluten (%)</b>					
1.	<24.0	0.82	0.58	4.77	2.62
2.	24.0-26.0	24.50	26.38	20.50	22.92
3.	26.1-28.0	67.79	68.99	60.25	64.46
4.	28.1-30.0	6.88	4.06	14.39	9.95
5.	>30.0	0.00	0.00	0.10	0.04
<b>Falling No. (Seconds)</b>					
1.	<300	0.00	0.00	0.00	0.00
2.	300-400	2.80	0.00	0.76	1.42
3.	401-500	45.51	58.84	29.08	39.89
4.	501-600	48.42	41.16	69.49	57.13
5.	>600	3.27	0.00	0.67	1.55

# **RESEARCH HIGHLIGHTS**

## RESEARCH HIGHLIGHTS

The wheat production in India is estimated to be 95.82 million tons during 2013-14. This could be made possible by developing high yielding, disease resistant wheat varieties and also matching production technologies. The increase in domestic demand of baked & pasta products and economic liberalisation & global trade have offered opportunities for better utilization of wheat. Wheat quality needs uppermost attention to meet the trade requirements of the domestic and international markets. The report includes aspects like identification of product specific genotypes. Promising genotypes showing superiority in various quality traits including grain nutrition parameters have been identified. Zone wise variability in grain nutrition parameters has been recorded. During 2013-14, nine thousand six hundred two (9602) AICW & BIP wheat grain samples belonging to AVTs, NIVTS, IVTs, Special Trials and Nurseries were analysed.



### AVTs :

All the 2<sup>nd</sup> and AVT entries including checks were subjected to baking evaluation for chapati, bread, biscuit and pasta products apart from analyzing them and also all the 1<sup>st</sup> year AVT entries for physico- chemical properties (grain appearance, test weight, protein, sedimentation value, moisture, phenol test, extraction rate, grain hardness index, wet / dry gluten and gluten index), HMWGS and grain nutrition (protein, yellow pigment, iron and zinc).

Product specific genotypes were identified from AVT trials. For the evaluation of chapati, several parameters like water absorption, dough nature & colour (before and after maturation), chapati appearance & its colour, aroma, pliability, taste, puffing height and loss of water (just after baking and after 4 hours of baking) were considered. Only those genotypes were selected for chapati, which scored > 8.0 score out 10.0.

#### **Promising Genotypes for Chapati**

<b>Category</b>	<b>Genotypes</b>
Check	C 306, K 8027, HD 2888 (RTS, NEPZ), HD 2864, HD 2932, MP 3336, (ILS, CZ), HI 1500 (RTS, RITS, CZ), MACS 6478 (ITS, PZ), HD 2932 (ILS, PS) and NIAW 1415 (RTS, PZ).
2 <sup>nd</sup> year AVT	WH 1129 (ILS, NWPZ), MP 3382 (ITS, CZ).

For bread quality evaluation, parameters like loaf volume, stickiness, appearance, crust colour, crumb colour, texture, taste and aroma were considered. Genotypes with > 575 ml loaf volumes were selected for bread.

#### **Promising Genotypes for Bread**

<b>Category</b>	<b>Genotypes</b>
Check	NW 2036 (ILS, NEPZ), MACS 6222 (ITS, PZ), HD 2.932, Raj 4083, HD 3090 (ILS, PZ), NI 5439 and NIAW 1415 (RTS, PZ).
2 <sup>nd</sup> year AVT	UAS 347, NIAW 1994 (RTS, PZ).

The spread factor was calculated by dividing the diameter of the biscuit with its thickness. The highest spread factor of 11.8 was exhibited by HS 490 (RILS, NHZ). This variety also showed lower SKCS grain hardness index of 20 indicating its higher potential towards biscuit making.

For the evaluation of pasta products (macaroni), various cooking quality parameters like cooking time, water absorption, water uptake ratio, gruel solid loss and stickiness were considered. Apart from these, sensory evaluation was carried out where parameters like colour, texture, flavour and overall acceptability using a '9' point hedonic scales were considered. Only those genotypes were selected which scored > 7.0 point on the hedonic scale and after considering cooking and other quality parameters. Genotypes recording >71.0% extraction rate were also identified.

### Promising Genotypes for Pasta Products (Macroni)

Category	Genotypes
Check	None
2 <sup>nd</sup> year AVT	HI 8736, HI 8737 (ITS, CZ), UAS 446 (RTS, PZ).

### Promising Genotypes for Extraction Rate

Category	Genotypes
Check	DBW 90, WH 1124 (ILS, NWPZ), K 0307 (ITS, NEPZ), HI 1563 (ILS, NEPZ), C 306 (RTS, NEPZ), Raj 4083 (ILS, PZ), NI 5439 (RTS, PZ) and COW (W) 1 (RITS, SHZ).
2 <sup>nd</sup> year AVT	None

Three species of wheat namely, *T.aestivum*, *T.durum* and *T.dicoccum* are cultivated in the country. Bread wheat is contributing approximately 95 % while around 4% comes from durum wheat and just about 1% is the share of *dicoccum* wheat to the total wheat production. The quality requirements of wheat for various products like chapati, bread, biscuit and pasta are different. Hard wheat (*T.aestivum*) with strong & extensible gluten and high protein is required for making good bread. For biscuit, the quality requirements are soft wheat, low protein and weak & extensible gluten. For chapati, we need hard wheat, medium to high protein and medium & extensible gluten. For pasta products, hard wheat (*T.durum*) with strong gluten, high protein, low yellow berry incidence and high  $\beta$ -carotene content are required.

Promising genotypes for various quality parameters were also identified. For *T. aestivum*, parameters included were protein, wet gluten, dry gluten, gluten index, hardness index, sedimentation value, glu-1 score, extraction rate, yellow pigment, iron and zinc. Likewise, *T.durum* genotypes were selected for various quality parameters and micronutrients.



### Promising Genotypes for Various Quality Parameters

PARAMETER	VALUE	GENOTYPES
<b>(<i>T.aestivum</i>)</b>		
<b>Test Weight</b>	>83.0 kg/hl	MP 3382, GW 451, HD 2864, GW 455, HI 1500, MP 3288, K 1215.
<b>Protein</b>	>12.5%	MP 3382, CG 1010, MACS 6222, MACS 6478, HD 2932, Raj 4083, HI 5439, NIAW 1415, NIAW 2030, HW 5216, MACS 6507.
<b>Wet Gluten</b>	>32.0%	MP 3382, HI 1544, HD 2932, MP 3336, PBW 689, MACS 6222, MACS 6478, NIAW 1415, HW 5216.
<b>Dry Gluten</b>	~11.0%	MP 3336, NIAW 1885, PBW 689, MACS 6222, MACS 6478, MP 2932, NIAW 1415.
<b>Gluten Index</b>	>80	VL 967, HPW 349, HPW 376, PBW 681, DBW 88.
<b>Sedimentation value</b>	~60 ml	HS 594, PBW 681, HUW 666, DPW 621-50, PBW 692, HUW 675, HI 5439.
<b>Extraction Rate</b>	>71.0%	DBW 90, WH 1124, K 0307, HI 1563, C 306, Raj 4083, NI 5439, COW (W) 1.
<b>Grain Hardness Index</b>	~80	DBW 98, PBW 704, C 306, K 1217, NI 5439, NIAW 1415, NIAW 2030, COW (W) 1.
	<45	HS 490, VL 3002, WH 1164.
<b>Yellow Pigment</b>	>4.0 PPM	VL 907, VL 804, HS 542, HS 490, DBW 39, DBW 107, NW 2036, BRW 3723, COW (W) 1.
<b>Iron</b>	~50.0 ppm	PBW 689, HI 1500, MP 3288, CG 1010, COW (W) 1. HW 2044, HW 5216, UAS 358, MACS 6507.
<b>Zinc</b>	>45.0 ppm	HPW 401, HS 590, TL 2995, CG 1010, HI 1500, COW (W) 1, HW 2044, HW 5216, MACS 6507.
<b>(<i>T.durum</i>)</b>		
<b>Protein</b>	~12.5%	HI 8755, UAS 428, UAS 446, HI 8751, MACS 3927.
<b>Sedimentation value</b>	~40 ml	PDW 233, DDW 30, DDW 27, HI 3927.
<b>Grain Hardness Index</b>	>80	MACS 3927, DDW 27, UAS 446, HI 8751, HI 8754, MACS 3927.
<b>Yellow Pigment</b>	~6.0 ppm	PDW 233, HD 4728, HD 4730, DDW 30, HI 8627, NIDW 295, DDW 27.
<b>Iron</b>	>45.0 ppm	A-9-30-1, HI 8751, HI 8754, MACS 3927.
<b>Zinc</b>	~45.0 ppm	A-9-30-1, MACS 3927, HI 8755, AKDW 2997-16, HI 8754, MACS 3927

All the *T.aestivum* 1<sup>st</sup> and 2<sup>nd</sup> year AVT entries including checks (1114 nos.) were analysed for various quality traits which included grain

appearance score, test weight, protein content, grain hardness index & sedimentation value and nutritional traits like iron & zinc. The 2<sup>nd</sup> year AVT entries including checks (557 nos.) were also analysed for wet gluten, dry gluten & gluten index, extraction rate and yellow pigment. The Yellow Pigment (ppm) for *T.aestivum* in NHZ, NWPZ, NEPZ, CZ, PZ, SHZ and overall were 3.68, 3.31, 3.54, 3.14, 2.93, 3.85 and 3.38 ranging from 2.40 to 4.67, 2.47 to 4.29, 2.41 to 4.41, 2.23 to 6.23, 1.93 to 3.91, 3.37 to 4.37 and 1.93 to 6.23 respectively.

### Variability in the Quality Parameter of *T.aestivum* in AVTs

Parameter	NHZ	NWPZ	NEPZ	CZ	PZ	SHZ	Overall
Grain Appearance (out of 10.0)	5.8 (4.8-7.5)	6.2 (3.0-7.6)	6.1 (4.9-6.8)	7.0 (6.0-7.9)	6.8 (5.7-8.4)	6.9 (6.0-8.6)	6.3 (3.0-8.4)
Test Weight (kg/hl)	78.5 (69.5-83.0)	78.3 (53.2-82.6)	79.4 (71.0-83.0)	82.5 (77.3-83.2)	81.2 (78.3-83.6)	80.1 (75.0-83.0)	79.4 (69.5-83.6)
Protein content (%)	9.8 (7.9-13.4)	11.7 (8.9-14.9)	11.2 (8.7-14.0)	11.5 (8.7-14.3)	12.5 (10.2-14.7)	12.6 (11.3-14.7)	11.3 (7.9-14.9)
Grain hardness Index	62 (14-89)	61 (34-87)	71 (35-96)	64 (40-86)	68 (45-85)	74 (55-99)	64 (14-99)
Sedimentation value (ml)	42 (31-65)	51 (26-67)	44 (31-59)	45 (28-60)	45 (35-58)	44 (32-57)	46 (26-67)
Wet Gluten (%)	20.2 (13.2-32.7)	27.9 (19.5-38.0)	27.6 (18.4-36.8)	30.9 (19.2-41.6)	32.9 (27.0-39.8)	30.4 (26.5-39.5)	27.5 (13.2-41.6)
Dry Gluten (%)	7.0 (5.3-10.3)	9.3 (6.7-13.0)	9.0 (6.3-11.8)	9.9 (6.6-12.9)	10.3 (8.5-11.8)	9.8 (8.8-11.8)	9.0 (5.3-13.0)
Gluten Index (%)	66 (40-89)	70 (40-89)	57 (35-85)	54 (39-74)	56 (37-71)	56 (43-71)	62 (35-89)
Extraction Rate (%)	63.1 (57.2-67.2)	69.6 (66.2-72.6)	70.3 (68.4-73.3)	69.1 (66.0-71.6)	70.6 (68.5-73.6)	70.9 (69.1-73.5)	68.6 (57.2-73.6)
Yellow Pigment (ppm)	3.68 (2.40-4.67)	3.31 (2.47-4.29)	3.54 (2.41-4.41)	3.14 (2.23-6.23)	2.93 (1.93-3.91)	3.85 (3.37-4.37)	3.38 (1.93-6.23)
Iron (ppm)	38.1 (29.7-49.2)	36.8 (28.3-47.1)	39.1 (28.1-54.0)	41.4 (32.0-57.9)	39.4 (30.8-47.7)	58.3 (46.8-68.3)	39.1 (28.1-68.3)
Zinc (ppm)	35.8 (19.7-55.9)	36.6 (20.9-53.8)	36.0 (20.5-57.5)	37.7 (21.5-59.8)	36.1 (19.3-50.7)	46.0 (38.2-59.0)	36.8 (19.3-59.8)

In brackets are given the range values.

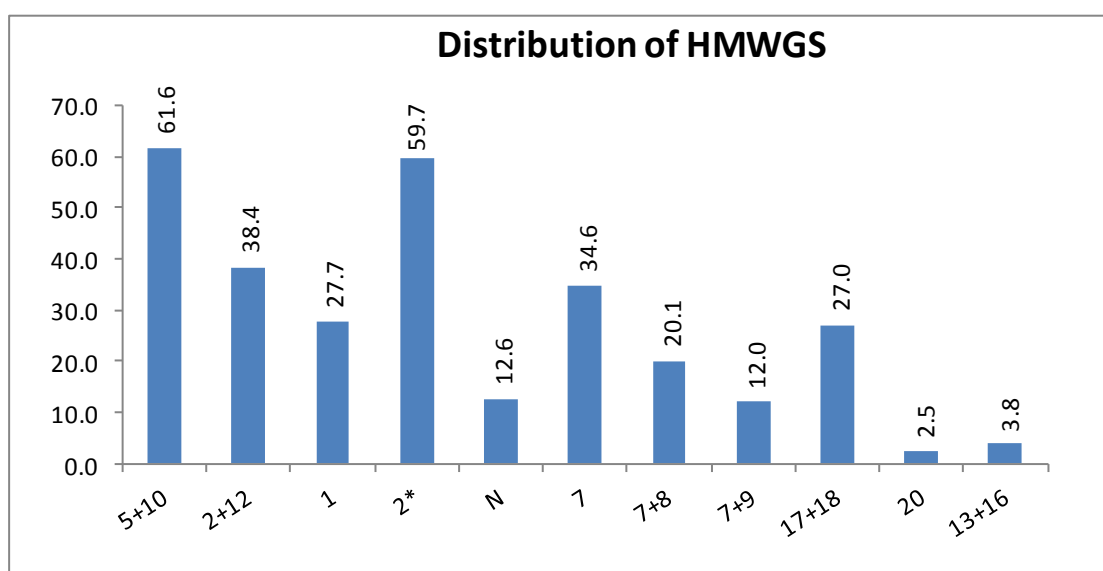
All the *T.durum* 1<sup>st</sup> and 2<sup>nd</sup> year AVT entries including checks (182 nos.) were analysed for various quality traits like grain appearance, test weight, protein content, grain hardness index, sedimentation value, yellow berry incidence and nutritional traits like yellow pigment, iron & zinc. For example, the mean values of yellow pigment (ppm) were distinctly higher in *T.durum*. The mean values for NWPZ, CZ, PZ and overall were 5.45, 5.43, 5.43 and 5.43 ranging from 2.39 to 8.06, 3.85 to 6.73, 3.71 to 6.41 and 2.39 to 8.06 respectively.

### Variability in Quality Parameters of *T. durum* in AVTs

Parameters	NWPZ	CZ	PZ	Overall
Grain Appearance (Out of 10.0)	6.5 (5.5-7.6)	7.2 (5.3-8.4)	7.9 (6.5-8.6)	7.2 (5.3-8.6)
Test Weight(kg/hl)	79.5 (74.0-83.0)	83.2 (74.6-83.8)	82.3 (80.0-83.4)	82.0 (74.0-83.8)
Protein Content (%)	11.2 (9.6-13.3)	11.5 (9.0-14.1)	12.2 (11.1-13.6)	11.5 (9.0-14.1)
Grain hardness Index	65 (61-85)	70 (49-85)	80 (58-99)	70 (49-99)
Sedimentation Value (ml)	40 (34-53)	32 (22-42)	35 (28-44)	35 (22-53)
Yellow Berry Incidence (%)	17.5 (0.0-85.1)	21.3 (0.0-77.7)	11.9 (0.0-48.3)	18.9 (0.0-85.1)
Yellow Pigment(ppm)	5.45 (2.39-8.06)	5.43 (3.85-6.73)	5.43 (3.71-6.41)	5.43 (2.39-8.06)
Iron (ppm)	37.6 (29.4-47.5)	39.8 (33.4-53.5)	40.5 (35.3-47.2)	39.3 (29.4-53.5)
Zinc (ppm)	38.4 (23.2-56.4)	40.1 (25.9-59.1)	40.3 (32.3-46.9)	39.7 (23.2-59.1)

In brackets are given the range values.

Two hundred twenty nine (229), 2<sup>nd</sup> and 1<sup>st</sup> year AVT entries including checks were evaluated for High Molecular Weight Glutenin Subunits (HMWGS). Subunits 5+10 and 2+12 were present in 61.6% and 38.4% of the total entries, whereas percent entries having 1, 2\* and N subunits were 27.7%, 59.7% and 12.6% respectively. Likewise, percent entries having subunits 7, 7+8, 7+9, 17+18, 20 and 13+16 were 34.6, 20.1, 12.0, 27.0, 2.5 and 3.8 respectively.



**NIVTs :**

The *T.aestivum* NIVTs were analysed for grain appearance, test weight, protein content and sedimentation value.

**Quality Parameters of *T.aestivum* in NIVTs**

<b>Trial</b>	<b>Condition</b>	<b>Zone</b>	<b>Grain Appearance (Max Score 10.0)</b>	<b>Test Weight (kg/hl)</b>	<b>Protein Content (%)</b>	<b>Sediment. Value (ml)</b>
NIVT 1A	ITS	NWPZ	5.5	75.3	11.8	42
NIVT 1A	ITS	NEPZ	5.7	78.0	10.7	40
NIVT 1A	ITS	Overall	5.6	76.3	11.4	41
NIVT 1B	ITS	NWPZ	7.1	74.6	12.4	36
NIVT 1B	ITS	NEPZ	7.1	77.6	11.0	36
NIVT 1B	ITS	Overall	7.1	75.7	11.9	36
NIVT 2	ITS	CZ	7.0	80.2	12.7	42
NIVT 2	ITS	PZ	7.0	79.4	14.0	45
NIVT 2	ITS	Overall	7.0	79.9	13.2	43
NIVT 3	ILS	NWPZ	5.5	75.7	11.9	37
NIVT 3	ILS	NEPZ	5.4	76.2	11.8	38
NIVT 3	ILS	CZ	6.8	78.1	12.1	41
NIVT 3	ILS	PZ	7.2	79.5	12.5	45
NIVT 3	ILS	Overall	6.1	77.0	12.0	39
NIVT 5A	RTS	NWPZ	5.6	73.7	12.9	45
NIVT 5A	RTS	NEPZ	5.9	78.7	10.4	45
NIVT 5A	RTS	CZ	5.9	79.4	13.0	45
NIVT 5A	RTS	PZ	6.1	79.7	12.9	51
NIVT 5A	RTS	Overall	5.9	77.8	12.3	46
NIVT 5A	RITS	Indore	6.0	81.3	11.2	46
NIVT 5A	RITS	Kota	5.7	79.5	12.8	48
NIVT 5A	RITS	Overall	5.9	80.4	12.0	47
IVT	ITS	NHZ	6.4	79.7	10.3	49
IVT	RTS	NHZ	6.1	79.5	9.5	46
IVT	RITS	SHZ	6.4	78.7	12.9	42

The *T. durum* NIVTs were also analysed for yellow berry incidence and yellow pigment.

### Quality Parameters of *T.durum* in NIVTs

Trial	Sowing Condition	Zone	Grain App. (max. Score 10.0)	Test Weight (kg/hl)/ TGW (g)	Protein Content (%)	Sed. Value (ml)	Yellow Berry (%)	Yellow Pigment (ppm)
NIVT 4A	ITS	NWPZ	5.5	79.2	12.0	35	7.9	5.80
NIVT4A	ITS	CZ	5.8	82.5	12.1	34	8.4	5.60
NIVT 4A	ITS	PZ	5.9	82.2	12.4	36	5.5	5.10
NIVT 4A	ITS	Over All	5.7	81.3	12.2	35	7.5	5.50
NIVT 5B	RTS	CZ	6.4	82.5	12.5	29	24.2	4.78
NIVT 5B	RTS	PZ	7.0	83.3	13.7	31	13.0	5.00
NIVT 5B	RTS	Over All	6.6	82.8	12.9	30	20.0	4.84

Promising entries were selected from NIVTs for promotion to AVT under irrigated timely sown (ITS) condition based on quality traits. From NIVT 1A, the selected entry was Raj 4376 for NWPZ. From NIVT 2, the selected entries were PBW 715 & HI 1603 for CZ and HD 3164 & HI 1603 for PZ.

#### Quality Component Screening Nursery :

**New genetic stocks:** Three genotypes namely QLD 46, GW 09-246 (d) and QLD 49 completed three years testing in QCSN and their average performance was compared with the checks and recently identified genetic resources. QLD 46 had all characteristics of rainfed variety C 306 as it was tall, late flowering, had good grain appearance (GAS: 6.5), sedimentation value (44ml), grain protein (13.2%) and bold grains (TGW: 46.4g). It shall be examined for *chapati* quality for any further decision. Durum entry GW 09-246 excelled in test weight (81.7 kg/hl) but remained at par with check PDW 233 and recently identified genetic resources like K 1005 and GW 07-112 for all other parameters. QLD 49, a bread wheat genotype derived from cross 37<sup>th</sup> IBWSN 72 / 5th IAT at DWR had very soft grain texture with grain hardness index only 13. Rest of the grain quality parameters i.e. protein (12.3%), test weight (78.2 kg/hl), sedimentation value (44ml), GAS (5.5) and yield (351 g/m<sup>2</sup>) were comparable with HI 977 and other soft grain genotype QLD 28. Therefore, QLD 49 was identified as genetic resource for grain softness.

## Special Trials :

The entries including checks of special trials on *T.dicoccum* were analysed for thousand grain weight, protein content, sedimentation value and yellow pigment. Similarly those of salinity/alkalinity trial and triticale trial were analysed for grain appearance, test weight, protein content and sedimentation value.

### Quality Parameters of Genotypes in *T.dicoccum* Trial

Centres (CZ)	Thousand Grain Weight (g)	Protein Content (%)	Sedimentation Value (ml)	Yellow Pigment (ppm)
Dharwad	44.8	14.7	24	3.16
Arabhavi	43.9	14.4	23	3.32
Kalloli	43.9	15.0	24	3.24
Ugar	40.2	12.7	21	3.36
Madhol	45.7	14.7	24	3.12
Pune	46.3	14.2	21	2.89
Overall	44.1	14.3	23	3.18

### Quality Parameters of Genotypes in Salinity/ Alkalinity Trial

Zone	Grain Appearance (Out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)
NWPZ	5.5	76.2	9.8	36
NEPZ	5.6	76.5	12.5	36
OVEALL	5.6	76.3	11.1	36

### Quality Parameters of Genotypes in Triticale Trial

Zone	Grain Appearance (Out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)
Ludhiana	6.1	72.9	13.2	32
Delhi	6.2	75.1	13.1	36
OVEALL	6.2	74.0	13.2	34

### Quality Parameters of Genotypes in *Wheat Bio-fortification* Trial

Zone	Grain Appearance (out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Grain Hardness Index	Sedimentation Value (ml)	Iron Content (ppm)	Zinc Content (ppm)
NWPZ	6.2	76.9	12.4	61	48	41.4	44.2
NEPZ	5.8	75.3	12.1	71	51	40.0	34.5
PZ	7.6	82.0	13.5	67	50	44.6	32.3
OVERALL	6.2	77.1	12.4	64	49	41.4	40.3

### Quality Parameters of Genotypes in *Wheat MABB/NIL* Trial

Zone	Grain Appearance (out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)	Grain Hardness Index
NWPZ	5.6	76.5	12.2	49	65
NEPZ	5.6	75.4	12.6	46	69
CZ	7.1	82.4	12.0	47	61
PZ	6.6	80.5	13.5	57	68
CZ+PZ	6.9	81.6	12.6	51	64

#### **New Initiative for Wheat Export (Analysis of FCI Wheat grain samples) :**

Considering the production level of 95.82 million tons during the year 2013-14, India can emerge as a major player for wheat export. Two thousand two hundred fifty one (2251) wheat grain samples drawn from stocks of Food Corporation of India (FCI) covering seven states viz. Punjab, Haryana & Madhya Pradesh were analysed for various wheat grading parameters like test weight, damaged kernel, foreign matter, shrunken & broken kernel, total defects & other classes and wheat functional parameters like protein, moisture, wet gluten, dry gluten & falling no. Based on these quality data, Food Corporation of India could export about 2.0 million tons of wheat through its exporting agencies.