

प्रगति प्रतिवेदन

PROGRESS REPORT

2019-20

सामाजिक विज्ञान
SOCIAL SCIENCES



अखिल भारतीय समन्वित गेहूँ एवं जौ अनुसंधान परियोजना

AICRP on Wheat and Barley

भा.कृ.अनु.प.-भारतीय गेहूँ एवं जौ अनुसंधान संस्थान, करनाल
ICAR-Indian Institute of Wheat and Barley Research, Karnal

For official use only

All India Coordinated Research Project on Wheat and Barley

**PROGRESS REPORT
2019-20**

SOCIAL SCIENCES

**Satyavir Singh
Anuj Kumar
Sendhil R
Anil Kumar Khippal
GP Singh**



**ICAR- Indian Institute of Wheat and Barley Research,
PO Box - 158, Agrasain Marg, Karnal – 132001
Haryana, India
www.iiwbr.org**



Correct Citation

ICAR-IIWBR 2020. Progress Report of AICRP on Wheat and Barley 2019-20, Social Sciences. Eds: Satyavir Singh, Anuj Kumar, Sendhil R, Anil Kumar Khippal and GP Singh. ICAR-Indian Institute of Wheat and Barley Research, Karnal, Haryana, India. P. 50.

**NO PART OF THIS REPORT SHOULD BE REPRODUCED
WITHOUT PRIOR PERMISSION OF THE DIRECTOR**

Issued on the occasion of 59th All India Wheat and Barley Research Workers' Meet organised in online mode during August 24-25, 2020.

ACKNOWLEDGEMENT

I wish to express my deep sense of gratitude to Dr. G.P. Singh, Director, ICAR-IIWBR, Karnal for his continuous encouragement, support and guidance in coordinating the activities under the AICRP on wheat and barley and during the preparation of this report.

Financial assistance provided by the Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India, New Delhi to coordinate wheat and barley frontline demonstrations is duly acknowledged.

I thankfully acknowledge the whole hearted support of each one of the co-operators whose sincere efforts helped in successful execution of frontline demonstrations (FLDs) during 2019-20.

Sincere thanks to my colleagues Dr. Anuj Kumar, Dr. Sendhil R and Dr. Anil Kumar Khippal for their prompt and sincere help in coordinating different activities of the Social Sciences Programme.

Appreciation and thanks are due to Dr. Mangal Singh and Dr. Ramesh Chand in extension activities, compilation, analysis and preparation of the report; Sh. Harinder Kumar for his support to the Social Sciences Programme; Mr. Naveen Kumar, Mr. Parveen Kumar and Mr. Navish Kumar for their help in typing this manuscript. I am thankful to Dr. Ajay Verma and Mr. P. Chandra Babu for the help rendered in smooth functioning of the computers required for analysis of data and preparation of the progress report. I am thankful to Mr. Yogesh Sharma for type setting and giving final shape to this report. The help rendered by Mr. Bhim Sain in the reprographic work is duly acknowledged.

Thanks are due to the officers and staff of the Administration, Finance, Coordination, Farm Section and other units for their cooperation and support to the Social Sciences Programme.

The authors are thankful to all those who have helped directly or indirectly in effective execution of the Social Sciences Programme.

In the end, it is stated that although utmost care has been taken to avoid any error in presentation of the results in this report, any error/omission is unintended and may please be brought to the notice of the undersigned.



(Satyavir Singh)
Principal Investigator
(Social Sciences)

Dated : 1st August, 2020

CONTENTS

S.No.	Particulars	Page
1.	Frontline Demonstrations (FLDs) 2019-20	1
2.	Wheat Frontline Demonstrations (FLDs) 2019-20	2
3.	Centre wise distribution of wheat FLDs	2
4.	State wise distribution of wheat FLDs	6
5.	Zone wise distribution of wheat FLDs	6
6.	Centre wise performance of improved wheat varieties	7
7.	State wise performance of improved wheat varieties	9
8.	Performance of improved timely sown wheat varieties	10
9.	Yield gain through bio-fortified wheat varieties	12
10.	Performance of improved late sown wheat varieties	13
11.	Zone wise productivity under wheat FLDs	13
12.	Highest wheat variety yield attained in various zones	14
13.	Yield gain through bio-fertilizer	14
14.	Performance of improved durum/dicoccum varieties	14
15.	Performance of improved varieties under rainfed/restricted irrigation	15
16.	Performance of zero tillage/Happy Seeder	15
17.	Performance of rotavator	16
18.	Yield gain through sprinkler /drip irrigation	17
19.	Performance of salt tolerant varieties	17
20.	Suggestions by cooperating centres	18
21.	Farmers' perception about FLDs	18
22.	Monitoring of Frontline Demonstrations (FLDs)	19
23.	Improved and check wheat varieties at farmers' field	28
24.	Zone wise popular wheat varieties	29
25.	Wheat FLDs at ICAR-IIWBR, Karnal centre	29
26.	Constraints analysis in different wheat producing zones of India	29
27.	Barley Frontline Demonstrations (FLDs) 2019-20	34
28.	Constraints analysis in different barley producing zones of India	39
29.	Costs and returns for wheat and barley FLDs vis-à-vis check plots	42
30.	Technology outreach programme	46
31.	Annexure-I : Categorywise number of wheat FLDs farmers	i-vii
32.	Annexure-II : Categorywise number of barley FLDs farmers	i-ii
33.	Annexure-III : Information on wheat varieties demonstrated in FLDs during 2019-20	i-vii
34.	Annexure-IV : Information on barley varieties demonstrated in FLDs during 2019-20	i

Frontline Demonstrations (2019-2020)

Globally, wheat and barley has been under cultivation in 271.57 million hectares (Wheat: 220.83 million hectares and Barley: 50.74 million hectares) with the annual production reaching an all-time highest output estimated at 923.99 million tonnes (Wheat: 769.31 million tonnes and Barley: 154.69 million tonnes) (Source: United States Department of Agriculture). The nutri-rich cereals respectively hold first and fourth position in terms of global cereals acreage for the period 2019-2020. In India, these *rabi* cereals are grown in 31.17 million hectares (24.94% of total crop acreage) covering five agro-climatic zones *viz.*, North Western Plains Zone (NWPZ), North Eastern Plains Zone (NEPZ), Central Zone (CZ), Northern Hills Zone (NHZ) and Peninsular Zone (PZ) contributing 36.79 per cent of the total foodgrains production during 2019-2020. Wheat has been under cultivation in 30.55 million hectares and barley covered 0.62 million hectares during 2019-2020 *rabi* season (Source: III Advance Estimates, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, India). The current year wheat production has touched a landmark output of 107.18 million tonnes with a record national average productivity of 3508 kg per ha. Similarly, barley registered 1.59 million tonnes during 2019-2020 from 0.62 million hectares with an average national productivity of 2617 kg/ha.

Frontline demonstrations (FLDs) conducted across regions also witnessed a similar kind of trend. The improved varieties and technologies demonstrated at farmers' field through the FLD programme exhibited significant yield gain across regions. The gaps (yield and information) across regions should be bridged through need based interventions by identifying the location-specific constraints. ICAR-IIWBR strives to make continuous efforts in popularizing the region-specific superior varieties as well as micro level strategies to enhance the wheat and barley productivity.

Despite several outreach programmes, there exists the need for increasing the crop productivity through different scientist-farmer interface activities with more emphasis on seed as well as varietal replacement, integrated crop (nutrient, pest & diseases, water, weed *etc.*) management, incorporation/retention of crop residues and soil health management. The farm advisory services through social media and rigorous training of field level extension functionaries or subject matter specialists by the institute has also played a key role in taking contingent management measures. Several other programmes have been initiated as well at the institute level to transfer the efficient technologies to farmers' field. Creation of awareness through mass and print media on seed treatment, seed and varietal replacement, and crop management helped to increase the farmers' livelihood and welfare. Procurement by different authorized agencies has also motivated the farmers to retain the same or allot more area under the respective crop. Developing storage facilities both at farm level and national level is the need of the hour and it warrants for some policy interventions. The report highlights the outcome of wheat and barley FLDs, yield gain due to FLDs, costs and returns as well as constraints in wheat and barley production.

Wheat Frontline Demonstrations (2019-2020)

During the wheat crop season 2019-20, 1500 Wheat Frontline Demonstrations (WFLDs) of one acre each were allotted to 85 cooperating centres across the country of which 1468 were conducted through 83 cooperating centers. The technologies such as improved wheat (*T.aestivum*, *T.durum* and *T. dicoccum*) varieties with complete package of practices, rotavator, zero tillage/happy seeder and bio-fertilizer were demonstrated in the selected farmers' fields. These WFLDs covered 1479.52 acres area of 1607 farmers in 19 states. The maximum number of WFLDs were conducted in UP (190) followed by Bihar (142), MP (137), Rajasthan (108), Maharashtra (100), Assam (91), Haryana (89), Karnataka (75), Punjab (73), HP (72), Jharkhand (65), J&K (51), Gujarat (50), Tamil Nadu (50), West Bengal (50), Chhattisgarh (43), Delhi & Uttarakhand (36) and Manipur (5). The details of centre wise and state wise WFLDs are given in Tables 1a, 1b, 2a and 2b.

Table 1a: Centre wise distribution of wheat FLDs during rabi 2019-20 (in acres)

S.No.	Zone and Name of Centre	WFLDs Allotted	WFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
NHZ					
1.	VPKAS, Almora (Uttarakhand)	18	18	18	76
2.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	12	12	12	13
3.	CSKHPKV, RWRC, Malan, Kangra (HP)	12	9	9	10
4.	KVK (CSKHPKV) and RSS, Berthin, Bilaspur (HP)	11	9	9	9
5.	CSKHPKV, HAREC, Dhaulakuan, Sirmour (HP)	10	Not conducted	-	-
6.	IARI, RS, Amartara Cottage, Shimla (HP)	12	5	5	14
7.	KVK (Dr.YSPUH&F), Chamba at Saru, Chamba (HP)	10	10	10	27
8.	MRCFC, SKUAST-K, Khudwani, Anantnag (J&K)	16	16	16	26
9.	RARS, SKUAST-Jammu, Tandwal, Rajouri (J&K)	12	10	10	10
10.	KVK (CSKHPKV), Bara, Hamirpur (HP)	15	15	15	28
11.	AICW&BIP Sub-Centre, CAU, Imphal (Manipur)	10	10	10	10
NEPZ					
12.	NDUA&T, Kumarganj, Ayodhya (UP)	18	18	18	18
13.	CSAU&T, Kanpur (UP)	20	20	20	19
14.	BHU, Varanasi (UP)	20	20	20	17
15.	KVK, Sohna, Sidharthnagar (UP)	25	24	24	25
16.	Kamla Nehru KVK, Sultanpur (UP)	12	12	12	12
17.	KVK (NDUA&T), Katiya, Banjariaya Farm, Basti (UP)	10	9	9	30
18.	BCKV, Kalyani, Nadia (West Bengal)	25	25	25	40
19.	UBKV, Pundibari, Coochbehar (West Bengal)	25	25	27.75*	16
20.	RARS, AAU, Shillongani, Nagaon (Assam)	25	25	25	25
21.	KVK (AAU), Chirakuta, (Jamduar Pt.II) Dhubri (Assam)	24	24	25.77*	51
22.	KVK (AAU), Napam, Tejpur, Sonitpur (Assam)	18	18	18	18
23.	KVK (AAU), Kajalgaon, Chirang (Assam)	24	24	24.5*	49
24.	IARI, RS, Pusa, Samastipur (Bihar)	25	25	25	25
25.	KVK (Gram Nirman Mandal), Sokhodeora, Nawadah (Bihar)	15	15	15	15
26.	KVK (RAU), Hariharpur, Vaishali (Bihar)	24	24	24	15
27.	KVK (Vanvasi Seva Kendra), Adhaura, Kaimur, Bhabua (Bihar)	18	18	18	17
28.	KVK (SKCET), Chanpura-Basaith, Madhubani (Bihar)	12	12	12	12
29.	KVK (RAU), Pipra Kothi, East Champaran (Bihar)	18	18	18	17
30.	KVK (RAU), Madhopur, West Champaran (Bihar)	18	18	18	18
31.	KVK (Samta Seva Kendra-Sitamarhi), Balha Madhusudan, Pupri, Sitamarhi (Bihar)	12	12	12	12
32.	BAU, Kanke, Ranchi (Jharkhand)	20	20	20	15
33.	KVK (Ramakrishna Mission), Morabadi, Ranchi (Jharkhand)	25	25	25	25
34.	KVK (BAU), Jagannathpur, West Singhbhum (Jharkhand)	20	20	20	20

S.No.	Zone and Name of Centre	WFLDs Allotted	WFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
NWPZ					
35.	KVK (CSKHPKV), Una (HP)	12	12	12	11
36.	KVK (SKUAST-Jammu), Rajhani, Kathua, Jammu (J&K)	25	25	25	26
37.	PAU, Ludhiana (Punjab)	25	25	25	25
38.	PAU, RRS, Gurdaspur (Punjab)	18	18	18	18
39.	KVK (PAU), Haveli Kalan, Rupnagar (Punjab)	15	15	15	13
40.	KVK (PAU), NagKalan-Jahangir, Majitha Road, Amritsar (Punjab)	15	15	15	11
41.	RBS College, Bichpuri, Agra (UP)	15	15	15	15
42.	KVK, Baghara, Muzaffarnagar (UP)	15	15	15	15
43.	ZARS, Nagina, Bijnor (UP)	12	12	12	12
44.	KVK, Khajuri Bagh, New Gopal Nagar, Saharanpur (UP)	12	12	12	12
45.	ICAR-IIFSR, Modipuram, Meerut (UP)	10	10	10	20
46.	KVK (SVPUAT-Meerut), Shamli (UP)	08	8	8	8
47.	Amity Centre for Extension Services, AUUP Campus, Sector-125, Noida (UP)	15	15	15	15
48.	GBPUA&T, Pantnagar, USNagar (Uttarakhand)	12	12	12	12
49.	KVK (GBPUAT-Pantnagar), Haridwar (Uttarakhand)	06	6	6	6
50.	CATAT, ICAR-IARI, New Delhi	18	18	18	18
51.	KVK (NHRDF), Ujwa, New Delhi	18	18	18	18
52.	ICAR-IIWBR, Karnal (Haryana)	20	20	20	20
53.	ICAR-CSSRI, Karnal (Haryana)	18	18	20*	20
54.	CCSHAU, Hisar (Haryana)	15	15	15	15
55.	KVK (CCSHAU), Bhiwani (Haryana)	12	12	12	12
56.	KVK (SCHE), Tepla, Ambala (Haryana)	12	12	12	9
57.	KVK (CCSHAU), Peoda Road, Kaithal (Haryana)	12	12	12	12
58.	RARI (SKNAU-Jobner), Durgapura, Jaipur (Rajasthan)	14	14	14	14
59.	KVK (SKNAU-Jobner), Ajmer (Rajasthan)	12	12	12	12
60.	KVK (Banasthali Vidyapeeth), Tonk (Rajasthan)	12	12	12	12
61.	ARS (SKRAU-Bikaner), Karni Road, Sriganganagar (Rajasthan)	12	12	12	16
62.	KVK (SKNAU-Jobner), Kumher, Bharatpur (Rajasthan)	06	6	6	6
63.	KVK (SKRAU-Bikaner), Gomat, Pokaran, Jaisalmer (Rajasthan)	06	Not conducted	-	-
CZ					
64.	RCOA (MPUA&T), Udaipur (Rajasthan)	18	18	18	18
65.	ARS (MPUAT-Udaipur), Borwat Farm, Banswara (Rajasthan)	16	16	16	16
66.	ARS (AU-Kota), Ummedganj Farm, Kota (Rajasthan)	18	18	18	18
67.	WRS (JAU), Junagarh (Gujarat)	25	25	25	25
68.	CERW (SDAU), Vijapur, Mehsana (Gujarat)	25	25	25	25
69.	JNKVV, Jabalpur (MP)	25	25	25	20
70.	ICAR-IARI, RWRS, Indore (MP)	25	25	25.5*	18
71.	KVK (JNKVV), Purushottampur, Panna (MP)	18	18	18	18
72.	KVK (JNKVV), Tikamgarh (MP)	25	25	25	24
73.	KVK (RVSKVV), Pipersama, Neemuch (MP)	12	12	12	12
74.	KVK (RVSKVV), COH, Mandsour (MP)	12	12	12	12
75.	KVK (RVSKVV), M.L.Nagar, Ujjain (MP)	10	10	10	10
76.	KVK (JNKVV), Sudamanagar, Indore road, Harda (MP)	10	10	10	10
77.	KVK (IGKV-Raipur), RRS, Kumhrawand Farm, Jagdalpur, Bastar (Chhattisgarh)	18	18	18	18
78.	BTC College of Agri & RS (IGKV-Raipur), Sarkanda, Bilaspur (Chhattisgarh)	25	25	25	25
PZ					
79.	Dr. PDKV, Krishi Nagar, Akola (Maharashtra)	25	25	25	25
80.	ARS, Niphad, Nasik (Maharashtra)	25	25	25	25
81.	MAU, Parbhani (Maharashtra)	25	25	26*	25
82.	ARI, MACS, Agharkar Road, Pune (Maharashtra)	25	25	25	25

S.No.	Zone and Name of Centre	WFLDs Allotted	WFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
83.	UAS, Dharwad (Karnataka)	50	50	50	50
84.	KVK (UAS-Dharwad), Indi, Vijayapura (Karnataka)	25	25	25	25
85.	ICAR-IARI, RS, Wellington (Tamil Nadu)	50	50	53	26
Total		1500	1468	1479.52	1607

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

Table 1b: Centre wise distribution of wheat FLDs during rabi 2019-20 (in hectares)

S.No.	Zone and Name of Centre	WFLDs Allotted	WFLDs Conducted	Area Sown (hectares)	No. of Farmers/ Locations
NHZ					
1.	VPKAS, Almora (Uttarakhand)	7.2	7.2	7.2	76
2.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	4.8	4.8	4.8	13
3.	CSKHPKV, RWRC, Malan, Kangra (HP)	4.8	3.6	3.6	10
4.	KVK (CSKHPKV) and RSS, Berthin, Bilaspur (HP)	4.4	3.6	3.6	9
5.	CSKHPKV, HAREC, Dhaulakuan, Sirmour (HP)	4	Not conducted	-	-
6.	IARI, RS, Amartara Cottage, Shimla (HP)	4.8	2	2	14
7.	KVK (Dr.YSPUH&F), Chamba at Saru, Chamba (HP)	4	4	4	27
8.	MRCFC, SKUAST-K, Khudwani, Anantnag (J&K)	6.4	6.4	6.4	26
9.	RARS, SKUAST-Jammu, Tandwal, Rajouri (J&K)	4.8	4	4	10
10.	KVK (CSKHPKV), Bara, Hamirpur (HP)	6	6	6	28
11.	AICW&BIP Sub-Centre, CAU, Imphal (Manipur)	4	4	4	10
NEPZ					
12.	NDUA&T, Kumarganj, Ayodhya (UP)	7.2	7.2	7.2	18
13.	CSAUA&T, Kanpur (UP)	8	8	8	19
14.	BHU, Varanasi (UP)	8	8	8	17
15.	KVK, Sohna, Sidharthnagar (UP)	10	9.6	9.6	25
16.	Kamla Nehru KVK, Sultanpur (UP)	4.8	4.8	4.8	12
17.	KVK (NDUA&T), Katiya, Banjariaya Farm, Basti (UP)	4	3.6	3.6	30
18.	BCKV, Kalyani, Nadia (West Bengal)	10	10	10	40
19.	UBKV, Pundibari, Coochbehar (West Bengal)	10	10	11.1*	16
20.	RARS, AAU, Shillongani, Nagaon (Assam)	10	10	10	25
21.	KVK (AAU), Chirakuta, (Jamduar Pt.II) Dhubri (Assam)	9.6	9.6	10.31*	51
22.	KVK (AAU), Napam, Tejpur, Sonitpur (Assam)	7.2	7.2	7.2	18
23.	KVK (AAU), Kajalgaon, Chirang (Assam)	9.6	9.6	9.8*	49
24.	IARI, RS, Pusa, Samastipur (Bihar)	10	10	10	25
25.	KVK (Gram Nirman Mandal), Sokhodeora, Nawadah (Bihar)	6	6	6	15
26.	KVK (RAU), Hariharpur, Vaishali (Bihar)	9.6	9.6	9.6	15
27.	KVK (Vanvasi Seva Kendra), Adhaura, Kaimur, Bhabua (Bihar)	7.2	7.2	7.2	17
28.	KVK (SKCET), Chanpura-Basaith, Madhubani (Bihar)	4.8	4.8	4.8	12
29.	KVK (RAU), Pipra Kothi, East Champaran (Bihar)	7.2	7.2	7.2	17
30.	KVK (RAU), Madhopur, West Champaran (Bihar)	7.2	7.2	7.2	18
31.	KVK (Samta Seva Kendra-Sitamarhi), Balha Madhusudan, Pupri, Sitamarhi (Bihar)	4.8	4.8	4.8	12
32.	BAU, Kanke, Ranchi (Jharkhand)	8	8	8	15
33.	KVK (Ramakrishna Mission), Morabadi, Ranchi (Jharkhand)	10	10	10	25
34.	KVK (BAU), Jagannathpur, West Singhbhum (Jharkhand)	8	8	8	20
NWPZ					
35.	KVK (CSKHPKV), Una (HP)	4.8	4.8	4.8	11
36.	KVK (SKUAST-Jammu), Rajhani, Kathua, Jammu (J&K)	10	10	10	26
37.	PAU, Ludhiana (Punjab)	10	10	10	25
38.	PAU, RRS, Gurdaspur (Punjab)	7.2	7.2	7.2	18
39.	KVK (PAU), Haveli Kalan, Rupnagar (Punjab)	6	6	6	13
40.	KVK (PAU), NagKalan-Jahangir, Majitha Road, Amritsar (Punjab)	6	6	6	11
41.	RBS College, Bichpuri, Agra (UP)	6	6	6	15
42.	KVK, Baghara, Muzaffarnagar (UP)	6	6	6	15

S.No.	Zone and Name of Centre	WFLDs Allotted	WFLDs Conducted	Area Sown (hectares)	No. of Farmers/ Locations
43.	ZARS, Nagina, Bijnor (UP)	4.8	4.8	4.8	12
44.	KVK, Khajuri Bagh, New Gopal Nagar, Saharanpur (UP)	4.8	4.8	4.8	12
45.	ICAR-IIFSR, Modipuram, Meerut (UP)	4	4	4	20
46.	KVK (SVPUAT-Meerut), Shamli (UP)	3.2	3.2	3.2	8
47.	Amity Centre for Extension Services, AUUP Campus, Sector-125, Noida (UP)	6	6	6	15
48.	GBPUA&T, Pantnagar, USNagar (Uttarakhand)	4.8	4.8	4.8	12
49.	KVK (GBPUAT-Pantnagar), Haridwar (Uttarakhand)	2.4	2.4	2.4	6
50.	CATAT, ICAR-IARI, New Delhi	7.2	7.2	7.2	18
51.	KVK (NHRDF), Ujwa, New Delhi	7.2	7.2	7.2	18
52.	ICAR-IIWBR, Karnal (Haryana)	8	8	8	20
53.	ICAR-CSSRI, Karnal (Haryana)	7.2	7.2	8*	20
54.	CCSHAU, Hisar (Haryana)	6	6	6	15
55.	KVK (CCSHAU), Bhiwani (Haryana)	4.8	4.8	4.8	12
56.	KVK (SCHE), Tepla, Ambala (Haryana)	4.8	4.8	4.8	9
57.	KVK (CCSHAU), Peoda Road, Kaithal (Haryana)	4.8	4.8	4.8	12
58.	RARI (SKNAU-Jobner), Durgapura, Jaipur (Rajasthan)	5.6	5.6	5.6	14
59.	KVK (SKNAU-Jobner), Ajmer (Rajasthan)	4.8	4.8	4.8	12
60.	KVK (Banasthali Vidyapeeth), Tonk (Rajasthan)	4.8	4.8	4.8	12
61.	ARS (SKRAU-Bikaner), Karni Road, Sriganganagar (Rajasthan)	4.8	4.8	4.8	16
62.	KVK (SKNAU-Jobner), Kumher, Bharatpur (Rajasthan)	2.4	2.4	2.4	6
63.	KVK (SKRAU-Bikaner), Gomat, Pokaran, Jaisalmer (Rajasthan)	2.4	Not conducted	-	-
CZ					
64.	RCOA (MPUA&T), Udaipur (Rajasthan)	7.2	7.2	7.2	18
65.	ARS (MPUAT-Udaipur), Borwat Farm, Banswara (Rajasthan)	6.4	6.4	6.4	16
66.	ARS (AU-Kota), Ummedganj Farm, Kota (Rajasthan)	7.2	7.2	7.2	18
67.	WRS (JAU), Junagarh (Gujarat)	10	10	10	25
68.	CERW (SDAU), Vijapur, Mehsana (Gujarat)	10	10	10	25
69.	JNKVV, Jabalpur (MP)	10	10	10	20
70.	ICAR-IARI, RWRS, Indore (MP)	10	10	10.2*	18
71.	KVK (JNKVV), Purushottampur, Panna (MP)	7.2	7.2	7.2	18
72.	KVK (JNKVV), Tikamgarh (MP)	10	10	10	24
73.	KVK (RVSKVV), Pipersama, Neemuch (MP)	4.8	4.8	4.8	12
74.	KVK (RVSKVV), COH, Mandasour (MP)	4.8	4.8	4.8	12
75.	KVK (RVSKVV), M.L.Nagar, Ujjain (MP)	4	4	4	10
76.	KVK (JNKVV), Sudamanagar, Indore road, Harda (MP)	4	4	4	10
77.	KVK (IGKV-Raipur), RRS, Kumhrawand Farm, Jagdalpur, Bastar (Chhattisgarh)	7.2	7.2	7.2	18
78.	BTC College of Agri & RS (IGKV-Raipur), Sarkanda, Bilaspur (Chhattisgarh)	10	10	10	25
PZ					
79.	Dr. PDKV, Krishi Nagar, Akola (Maharashtra)	10	10	10	25
80.	ARS, Niphad, Nasik (Maharashtra)	10	10	10	25
81.	MAU, Parbhani (Maharashtra)	10	10	10.4*	25
82.	ARI, MACS, Agharkar Road, Pune (Maharashtra)	10	10	10	25
83.	UAS, Dharwad (Karnataka)	20	20	20	50
84.	KVK (UAS-Dharwad), Indi, Vijayapura (Karnataka)	10	10	10	25
85.	ICAR-IARI, RS, Wellington (Tamil Nadu)	20	20	21.2	26
Total		600	587.2	591.81	1607

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

The wheat FLDs data received from the cooperating centers which were not reported properly as per FLDs guidelines were not included for analysis.

Table 2a: State wise distribution of wheat FLDs during *rabi* 2019-20 (in acres)

State	No. of centers	WFLDs Allotted	WFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
Uttarakhand	3	36	36	36	94
HP	8	94	72	72	112
J&K	3	53	51	51	62
Manipur	1	10	10	10	10
UP	13	192	190	190	218
West Bengal	2	50	50	52.75	56
Assam	4	91	91	93.27	143
Bihar	8	142	142	142	131
Jharkhand	3	65	65	65	60
Punjab	4	73	73	73	67
Delhi	2	36	36	36	36
Haryana	6	89	89	91	88
Rajasthan	9	114	108	108	112
Gujarat	2	50	50	50	50
MP	8	137	137	137.5	124
Chhattisgarh	2	43	43	43	43
Maharashtra	4	100	100	101	100
Karnataka	2	75	75	75	75
Tamil Nadu	1	50	50	53	26
Total	85	1500	1468	1479.52	1607

Table 2b: State wise distribution of wheat FLDs during *rabi* 2019-20 (in hectares)

State	Number of centers	WFLDs Allotted	WFLDs Conducted	Area Sown (hectares)	No. of Farmers/ Locations
Uttarakhand	3	14.4	14.4	14.4	94
HP	8	37.6	28.8	28.8	112
J&K	3	21.2	20.4	20.4	62
Manipur	1	4.0	4.0	4.0	10
UP	13	76.8	76.0	76.0	218
West Bengal	2	20.0	20.0	21.1	56
Assam	4	36.4	36.4	37.31	143
Bihar	8	56.8	56.8	56.8	131
Jharkhand	3	26.0	26.0	26.0	60
Punjab	4	29.2	29.2	29.2	67
Delhi	2	14.4	14.4	14.4	36
Haryana	6	35.6	35.6	36.4	88
Rajasthan	9	45.6	43.2	43.2	112
Gujarat	2	20.0	20.0	20.0	50
MP	8	54.8	54.8	55.0	124
Chhattisgarh	2	17.2	17.2	17.2	43
Maharashtra	4	40.0	40.0	40.4	100
Karnataka	2	30.0	30.0	30.0	75
Tamil Nadu	1	20.0	20.0	21.2	26
Total	85	600	587.2	591.81	1607

Table 3a: Zone wise distribution of wheat FLDs during *rabi* 2019-20 (in acres)

Zone	Number of centers	WFLDs Allotted	WFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
NHZ	11	138	114	114	223
NEPZ	23	453	451	456.02	511
NWPZ	29	402	396	398	403
CZ	15	282	282	282.5	269
PZ	07	225	225	229	201
Total	85	1500	1468	1479.52	1607

Table 3b: Zone wise distribution of wheat FLDs during *rabi* 2019-20 (in hectares)

Zone	Number of centers	WFLDs Allotted	WFLDs Conducted	Area Sown (hectares)	No. of Farmers/ Locations
NHZ	11	55.2	45.6	45.6	223
NEPZ	23	181.2	180.4	182.41	511
NWPZ	29	160.8	158.4	159.2	403
CZ	15	112.8	112.8	113.1	269
PZ	07	90.0	90.0	91.6	201
Total	85	600	587.2	591.81	1607

Table 4: Centre wise performance of improved wheat varieties during *rabi* 2019-20

Zone & Centre	Improved varieties/FLD Mean yield (q/ha)	Check varieties Mean yield (q/ha)	Gain (%)
NHZ			
Almora	37.18	30.23	22.99***
Bajaura	29.73	25.30	17.49***
Malan Kangra	29.73	26.70	11.33***
Bilaspur	25.00	14.93	67.50***
Tutikandi, Shimla	31.85	28.60	11.36 ^{NS}
Chamba	22.60	16.13	40.16***
Khudwani, Anantnag	33.58	29.73	12.95***
Tandwal, Rajouri	30.28	24.83	21.95**
Hamirpur	21.05	17.18	22.56***
Imphal, Manipur	16.75	10.50	59.52***
NEPZ			
Ayodhya	54.90	50.63	8.44***
Kanpur	41.15	30.88	33.28***
Varanasi	32.35	23.90	35.36***
Siddharthnagar	41.05	40.23	02.05 ^{NS}
Sultanpur	44.68	36.45	22.57***
Basti	41.83	34.10	22.65***
Kalyani, Nadia	43.28	36.83	17.52***
Coochbehar	38.10	34.90	09.17***
Shillongani	32.75	22.78	43.80***
Dhubri	29.03	22.73	27.72***
Sonitpur	40.90	29.18	40.19***
Chirang	22.55	16.53	36.46***
Samastipur	51.05	46.10	10.74***
Nawada	52.43	47.85	09.56***
Vaishali	38.28	33.28	15.03***
Adhaura, Kaimur	39.25	31.83	23.33***
Madhubani	32.33	25.83	25.17***
East Champaran	44.95	40.10	12.09***
West Champaran	52.65	44.03	19.59***
Sitamarhi	35.90	29.33	22.42***
Kanke, Ranchi	45.18	24.68	83.08***
Morabadi, Ranchi	39.88	34.95	14.09***
West Singhbhum	29.83	25.23	18.24***
NWPZ			
Una, HP	52.13	50.50	03.22*
Kathua, Jammu	42.80	40.15	6.60***
Ludhiana	56.93	54.10	05.22**
Gurdaspur	48.20	44.93	07.29***
Ropar	51.25	50.48	01.54 ^{NS}

Zone & Centre	Improved varieties/FLD Mean yield (q/ha)	Check varieties Mean yield (q/ha)	Gain (%)
Amritsar	50.63	48.58	04.22**
Bichpuri, Agra	47.33	42.20	12.14***
Muzaffarnagar	47.65	39.63	20.25***
Nagina, Bijnor	47.58	44.75	06.31***
Saharanpur	52.20	44.28	17.89***
Modipuram, Meerut	42.53	39.60	07.39***
Shamli UP	69.48	64.60	07.55***
Amity Noida	58.70	50.13	17.11***
Pantnagar, US Nagar	53.43	53.38	00.09 ^{NS}
Haridwar	47.08	37.93	24.13***
IARI, New Delhi	57.80	53.03	09.01***
Ujwa, New Delhi	51.73	46.45	11.36***
IWBR, Karnal	59.33	54.40	09.05***
CSSRI, Karnal	43.13	41.35	04.29 ^{NS}
Hisar	57.35	56.10	02.23*
Bhiwani	50.58	45.43	11.34***
Ambala	51.05	49.18	03.81 ^{NS}
Kaithal	55.68	54.43	02.30**
Durgapura, Jaipur	66.25	61.43	07.86***
Ajmer	56.05	43.65	28.41***
Tonk	50.23	49.43	01.62 ^{NS}
Sriganganagar	48.75	46.10	05.75 ^{NS}
Bharatpur	46.68	42.93	08.74**
CZ			
Udaipur	51.10	46.55	09.77**
Banswara	43.05	38.45	11.96***
Kota	55.70	51.55	08.05***
Junagarh	63.65	57.25	11.18***
Vijapur, Mehsana	49.65	42.68	16.34***
Jabalpur	52.23	39.45	32.38***
Indore	58.90	45.55	29.31***
Panna	34.10	29.30	16.38***
Tikamgarh MP	40.58	35.70	13.66***
Neemuch	68.48	60.40	13.37***
Mandsaur	62.08	55.93	11.00***
Ujjain	71.40	61.50	16.10***
Harda	54.20	49.35	09.83**
Jagdapur, Bastar	24.55	19.70	24.62***
Sarkanda, Bilaspur	37.83	32.23	17.38***
PZ			
Akola	35.53	30.55	16.28***
Niphad, Nashik	41.15	35.98	14.38***
Parbhani	35.90	31.80	12.89***
Pune	43.63	30.60	42.57***
Dharwad	23.23	21.70	07.03 ^{NS}
Indi, Vijaypura	33.00	30.90	06.80 ^{NS}
Wellington	24.15	-	-

*** Significant at 1 percent level, ** Significant at 5 percent level, * Significant at 10 percent level, NS is Non-significant

Centre wise yield gain over check at different centres in different wheat growing zones is given in Table 4. The significant yield gain in NHZ was 67.50% per cent at Bilaspur centre followed by Imphal Manipur (59.52%), Chamba (40.16%), Almora (22.99%), Hamirpur

(22.56%), Tandwal Rajouri (21.95%) and Bajaura (17.49%). In NEPZ, the yield gain varied from 08.44 per cent at Ayodhya to 83.08 per cent at Kanke Ranchi. The maximum yield gain due to improved wheat varieties was 83.08% at Kanke Ranchi followed by 43.80% at Shillongani, 40.19% at Sonitpur, 36.46% at Chirang, 35.36% at Varanasi, 33.28% at Kanpur and 27.72% at Dhubri. In NWPZ, the significant highest yield gain was at Ajmer (28.41%) followed by Haridwar (24.13%), Muzaffarnagar (20.25%), Saharanpur (17.89%) and Amity Noida (17.11%). In CZ, the highest significant yield gain was recorded at Jabalpur (32.38%) followed by Indore (29.31%) and Jagdalpur Bastar (24.62%). In PZ, the significant yield gain of 42.57, 16.28, 14.38 and 12.89 per cent at Pune, Akola, Niphad Nashik and Parbhani centers, respectively.

Table 5: State wise performance of improved wheat varieties during *rabi* 2019-20

State	Mean yield (q/ha)		Gain (%)
	Improved	Check	
Assam	28.95	21.43	35.12***
Bihar	44.53	38.53	15.57***
Chhattisgarh	32.28	26.98	19.65***
Gujarat	56.65	49.95	13.41***
Haryana	52.70	49.95	05.51***
HP	27.48	22.80	20.50***
J&K	37.65	34.10	10.41***
Jharkhand	37.85	28.63	32.23***
Karnataka	26.48	24.75	06.97 ^{NS}
Maharashtra	38.65	32.38	19.38***
Manipur	16.75	10.50	59.52***
MP	52.55	44.33	18.56***
Delhi	54.78	49.75	10.10***
Punjab	52.45	50.03	04.85***
Rajasthan	52.45	47.80	09.73***
Tamil Nadu	24.15	-	-
UP	46.40	40.45	14.71***
Uttarakhand	39.88	33.68	18.41***
West Bengal	41.80	36.28	15.23***

*** Significant at 1 percent level, NS is Non-significant

Statewise yield gain over check in different states is given in Table 5. All the improved varieties for different production conditions (timely sown, late sown, rainfed) have been included while calculating the yield gain over check/regional yield). The maximum yield gain was observed in Manipur (59.52%) followed by Assam (35.12%), Jharkhand (32.33%), HP (20.50%), Chhattisgarh (19.65%), Maharashtra (19.38%) and MP (18.56%).

Table 6: Performance of improved timely sown wheat varieties during rabi 2019-20

Zone & Centre	Improved varieties	Mean yield (q/ha)	Check varieties	Mean yield (q/ha)	Gain (%)
NHZ					
Almora	VL 967	37.17	Local	30.23	22.93***
Bajaura	HS 542	29.73	HS 507	25.30	17.49***
Malan	HS 542	29.73	HPW 349	26.70	11.33***
Bilaspur	HS 542	25.00	HPW 155	14.93	67.41***
Shimla	HS 542	31.85	HS 507	28.50	11.75 ^{NS}
Chamba	HS 542	22.59	HPW 236	16.12	40.15***
Khudwani	HS 542	33.58	SKW 355	29.72	12.98***
Rajouri	HS 542	30.28	VL 829	24.83	21.95**
Hamirpur	HPW 368	22.5	Local	17.16	31.15***
Hamirpur	HS 542	20.46	Local	17.18	19.14***
Imphal	HS 542	16.75	K 7410	10.50	59.52***
NEPZ					
Ayodhya	DBW 187	60.63	Malviya 234	54.00	12.27***
Ayodhya	HD 3086	52.69	HD 2733	49.33	06.82***
Kanpur	DBW 187	40.20	PBW 343	31.50	27.62**
Kanpur	HD 3086	41.46	PBW 343	30.67	35.19**
Varanasi	DBW 187	33.13	HD 2967	25.63	29.27**
Varanasi	HD 3086	32.14	HUW 468	23.39	37.40***
Sidharthnagar	HD 3086	40.12	HD 2967	38.10	05.30 ^{NS}
Sultanpur	HD 3086	43.00	PBW 502	35.75	20.28**
Sultanpur	DBW 187	42.92	PBW 154	33.83	26.85*
Sultanpur	HD 3086	45.91	PBW 154	37.79	21.51***
Basti	HD 3086	41.82	HD 2967	34.09	22.67**
Kalyani	DBW 187	50.17	PBW 343	40.58	23.61*
Kalyani	DBW 187	52.50	UP 262	42.50	23.53**
Kalyani	HD 3086	45.83	HD 2967	47.58	-03.68 ^{NS}
Kalyani	HD 3086	46.39	PBW 343	40.96	13.25**
Kalyani	HD 3086	39.11	UP 262	32.70	19.59***
Shillongani	DBW 187	31.94	Sonalika	22.31	43.14***
Shillongani	HD 3086	32.71	Sonalika	22.31	46.64***
Dhubri	HD 3086	29.02	Sonalika	22.72	27.72***
Sonitpur	HD 3086	40.21	Local	28.45	41.34***
Sonitpur	HD 3086	42.72	Sonalika	31.09	37.41***
Chirang	HD 3086	22.55	Sonalika	16.52	36.55***
Pusa Samastipur	DBW 187	58.00	HD 2967	47.90	21.09***
Pusa Samastipur	HD 3086	49.33	HD 2967	45.68	07.99***
Nawada	HD 3086	53.23	HD 2967	51.74	02.86 ^{NS}
Nawada	HD 3086	53.62	PBW 343	46.65	14.95***
Nawada	HD 3086	50.91	PBW 502	46.29	09.99***
Vaishali	HD 3086	38.27	HD 2733	33.27	15.03***
Kaimur	HD 3086	38.95	PBW 373	31.60	23.26***
Kaimur	HD 3086	40.57	HD 2967	31.63	28.24***
Kaimur	HD 3086	38.96	HUW 234	32.06	21.50***
Madhubani	HD 3086	32.50	PBW 343	25.54	27.23***
Madhubani	HD 3086	32.00	UP 262	26.35	21.44***
East Champaran	HD 3086	44.96	HD 2733	40.10	12.10***
West Champaran	HD 3086	53.25	UP 262	44.00	21.02***
Sitamarhi	HD 3086	38.00	HD 2967	35.00	08.57 ^{NS}
Sitamarhi	HD 3086	36.11	PBW 343	28.79	25.43***
Sitamarhi	HD 3086	35.00	PBW 502	28.88	21.21***
Kanke	DBW 187	45.00	HD 2967	30.00	50.00 ^{NS}
Kanke	HD 3086	50.00	HD 2967	35.00	42.86 ^{NS}
Kanke	HD 3086	44.75	K 9107	23.50	90.43***
Kanke	HD 3086	45.00	UP 262	23.33	92.86 ^{NS}

Morabadi	DBW 187	54.05	UP 262	41.85	29.15 ^{NS}
Morabadi	HD 3086	42.35	UP 262	34.05	24.40 ^{***}
West Singhbhum	HD 3086	29.83	K 9107	25.23	18.24 ^{***}
NWPZ					
Una	HD 3226	51.29	HD 3086	50.13	02.33 ^{NS}
Kathua	HD 3226	43.09	HD 2967	39.97	07.79 ^{***}
Ludhiana	PBW 677	57.75	PBW 725	55.25	04.52 ^{NS}
Agra	HD 3226	47.60	PBW 502	42.30	12.53 ^{***}
Muzaffarnagar	HD 3226	47.61	PBW 502	40.12	18.68 ^{NS}
Saharanpur	HD 3226	54.24	HD 2967	44.08	23.05 ^{***}
Meerut	HD 3226	42.65	PBW 502	39.50	07.98 ^{***}
Shamli	DBW 187	72.75	HD 2967	64.75	12.36 ^{***}
Noida	HD 3226	61.43	HD 2967	51.50	19.29 ^{***}
Noida	HD 3226	61.84	HD 3086	51.24	20.69 ^{***}
Ujwa, New Delhi	HD 3226	56.00	WH 711	47.00	19.15 ^{**}
IIWBR, Karnal	DBW 187	62.50	HD 2967	50.00	25.00 ^{NS}
CSSRI, Karnal	KRL 210	43.12	HD 2967	41.35	04.29 ^{NS}
Bhiwani	HD 3226	54.04	D 2967	45.83	17.91 ^{***}
Durgapura	HD 3226	66.25	Raj 4079	61.88	07.06 ^{***}
Ajmer	HD 3226	61.67	Raj 3077	45.83	34.55 ^{***}
Ajmer	HD 3226	65.00	Raj 4037	45.42	43.12 ^{***}
Tonk	HD 3226	51.83	Raj 4120	51.46	00.72 ^{NS}
Sriganganagar	HD 3226	51.25	Raj 1482	46.88	09.33 ^{NS}
CZ					
Banswara	DBW 110	43.05	Raj 4120	38.44	11.99 ^{***}
Junagarh	GW 451	64.55	GW 496	57.95	11.40 ^{***}
Junagarh	GW 451	62.50	Lok 1	56.36	10.89 ^{***}
Vijapur	GW 451	49.67	GW 496	42.27	17.49 ^{***}
Jabalpur	MP 3382	52.22	GW 273	39.46	32.34 ^{***}
Indore	HD 2987	49.00	HI 1531	38.50	27.27 ^{**}
Indore	HI 1544	60.25	Lok 1	46.75	28.88 ^{***}
Indore	HI 1605	51.25	HI 1531	35.75	43.36 ^{**}
Panna	DBW 110	34.10	JW 3211	29.30	16.38 ^{***}
Tikamgarh	DBW 110	40.58	GW 322	35.69	13.72 ^{***}
Neemach	DBW 110	68.48	Lok 1	60.40	13.38 ^{***}
Mandsaur	DBW 110	62.08	Lok 1	55.93	11.00 ^{***}
Ujjain	DBW 110	71.40	HI 1544	61.50	16.10 ^{***}
Harda	DBW 110	54.20	GW 322	49.34	09.85 ^{**}
Jagdapur	DBW 110	25.45	Lok 1	18.14	40.27 ^{***}
Bilaspur	CG 1018	37.82	GW 273	32.24	17.33 ^{***}
PZ					
Niphad	NIAW 3170	41.90	NIAW 1994	36.45	14.95 ^{***}
Parbhani	NIAW 1994	35.88	NIAW 301	31.80	12.84 ^{***}
Pune	MACS 6478	43.85	HD 2189	30.48	43.86 ^{***}
Dharwad	UAS 304	31.61	DWR 162	30.00	05.36 [*]
Dharwad	UAS 347	14.56	Local	11.72	24.27 ^{**}
Dharwad	UAS 375	13.78	Local	12.43	10.89 ^{***}
Indi Vijayapura	UAS 304	38.00	Ankur	32.95	15.32 ^{***}
Wellington	HW 5207	24.00	-	-	-
Wellington	HW 1098 (dic)	24.18	-	-	-

*** Significant at 1 percent level, ** Significant at 5 percent level, * Significant at 10 percent level, NS is Non-significant

The variety wise mean yield data revealed that variety VL 967 gave highest yield of 37.17 q/ha at Almora center in NHZ followed by HS 542 (33.58 q/ha) at Khudwani center which was significantly higher than the check variety (Table 6). In NEPZ, the highest significant average yield was recorded by DBW 187 variety at Ayodhya (60.63 q/ha) followed by the same variety DBW 187 (58.00 q/ha) at Pusa Samastipur. In NWPZ, the highest significant

average yield was recorded by DBW 187 (72.75 q/ha) at Shamli followed by HD 3226 (66.25 q/ha) at Durgapura Jaipur center. In CZ, DBW 110 gave highest significant average yield of 71.40 q/ha at Ujjain centre followed by the same variety DBW 110 (68.48 q/ha) at Neemach and GJW 451 (64.55 q/ha) at Junagarh centre. In PZ, MACS 6478 gave the highest significant yield (43.85 q/ha) at Pune centre followed by NIAW 3170 (41.90 q/ha) at Niphad Nashik and UAS 304 (38.00 q/ha) at Indi Vijayapura centre.

The biofortified variety HPBW 01 was demonstrated in NWPZ. The significant yield gain of 24.18%, 23.58%, 18.80%, 13.98%, 11.43%, 10.80% and 10.48% was recorded at Haridwar, Muzaffarnagar, Ajmer, IARI New Delhi, Agra, Saharanpur and Gurdaspur centers, respectively (Table 7a).

Table 7a : Yield gain through bio-fortified wheat varieties during rabi 2019-20 in NWPZ

NWPZ Centre	Improved varieties	Mean yield (q/ha)	Check varieties	Mean yield (q/ha)	Gain (%)
Una	HPBW 01	53.15	HD 3086	50.95	04.32 ^{NS}
Kathua	HPBW 01	42.09	HD 2967	40.56	03.78 ^{NS}
Ludhiana	HPBW 01	56.28	PBW 725	52.47	07.25 ^{NS}
Gurdaspur	HPBW 01	48.33	HD 2967	43.75	10.48 ^{**}
Gurdaspur	HPBW 01	50.00	HD 3086	46.25	08.11 ^{NS}
Gurdaspur	HPBW 01	50.00	PBW 677	48.75	02.56 ^{NS}
Gurdaspur	HPBW 01	49.17	PBW 725	47.08	04.42 ^{NS}
Gurdaspur	HPBW 01	48.75	PBW 723	46.88	04.00 ^{NS}
Ropar	HPBW 01	50.00	HD 3086	49.58	00.84 ^{NS}
Ropar	HPBW 01	51.25	PBW 725	50.00	02.50 ^{NS}
Ropar	HPBW 01	51.72	Unnat PBW 343	50.94	01.53 ^{NS}
Amritsar	HPBW 01	50.16	HD 2967	48.58	03.24 [*]
Amritsar	HPBW 01	53.25	HD 3086	50.50	05.45 ^{NS}
Amritsar	HPBW 01	52.25	PBW 627	46.50	12.37 ^{NS}
Muzzaffarnagar	HPBW 01	47.74	PBW 502	38.63	23.58 ^{***}
Agra	HPBW 01	46.80	PBW 343	42.00	11.43 ^{***}
Saharanpur	HPBW 01	49.33	HD 2967	44.52	10.80 [*]
Shamli	HPBW 01	66.19	HD 2967	64.44	02.72 ^{***}
Noida	HPBW 01	52.30	HD 2967	46.90	11.51 ^{***}
Noida	HPBW 01	53.25	HD 3086	48.90	08.90 ^{NS}
Haridwar	HPBW 01	47.08	PBW 550	37.92	24.18 ^{***}
IARI, New Delhi	HPBW 01	56.25	HD 3086	48.75	15.38 ^{NS}
IARI, New Delhi	HPBW 01	52.50	PBW 226	43.75	20.00 ^{NS}
IARI, New Delhi	HPBW 01	59.13	Super 303	51.88	13.98 ^{**}
Ujwa, New Delhi	HPBW 01	50.10	WH 711	46.25	08.32 ^{***}
Bhiwani	HPBW 01	47.08	HD 2967	45.00	04.63 ^{NS}
Durgapura	HPBW 01	66.25	Raj 4079	60.83	08.91 ^{***}
Ajmer	HPBW 01	49.38	Raj 3077	41.56	18.80 ^{***}
Ajmer	HPBW 01	47.50	Raj 4037	41.88	13.43 ^{NS}
Tonk	HPBW 01	48.63	Raj 4120	47.38	02.64 ^{NS}
Sriganganagar	HPBW 01	46.25	Raj 1482	45.33	02.04 ^{NS}
Bharatpur	HPBW 01	46.67	Raj 3077	42.92	08.74 ^{**}

The late sown varieties mean yield data revealed that variety DBW 173 gave significantly higher yield (43.75 q/ha) at Meerut center in NWPZ (Table 7). In CZ, the significant average yield was recorded by Raj 4238 (51.00 q/ha) at Udaipur center. In PZ, the significant average yield was recorded by AKAW 4210-6 (35.38 q/ha) at Akola center (Table 7b).

Table 7b: Performance of improved late sown wheat varieties during rabi 2019-20

Zone & Centre	Improved varieties	Mean yield (q/ha)	Check varieties	Mean yield (q/ha)	Gain (%)
NWPZ					
Meerut	DBW 173	42.65	PBW 226	39.68	07.48***
CZ					
Udaipur	Raj 4238	51.00	Lok 1	45.80	11.35**
Udaipur	Raj 4238	50.83	Raj 4037	47.00	08.16**
Udaipur	Raj 4238	50.20	Raj 4079	45.40	10.57**
Vijapur	GW 499	48.93	GW 496	41.72	17.29**
PZ					
Akola	AKAW 4210-6	35.38	Lok 1	30.30	16.77***

*** Significant at 1 percent level, ** Significant at 5 percent level

The yield gain due to improved varieties over regional mean yield was highest in CZ (36.48%) followed by NEPZ (32.61%), PZ (31.19 %), NHZ (25.97%) and NWPZ (16.52%) (Table 8a). It is clear from table 8a that there was a significant yield gain in all the zones under wheat FLDs, which ranged from 16.52% in north western plains zone to 36.48% in central zone.

Table 8a: Zone wise productivity under FLDs over regional mean during rabi 2019-20

Zone	Mean yield (q/ha)		Gain (%)
	WFLDs	Regional	
NHZ	29.98	23.80	25.97***
NEPZ	38.47	29.01	32.61***
NWPZ	51.85	44.50	16.52***
CZ	49.61	36.35	36.48***
PZ	31.97	24.37	31.19***

*** Significant at 1 percent level

Across all zones demonstrated varieties have shown yield superiority over check varieties and it ranged from 08.07% in NWPZ to 23.94% in NHZ. The yield gain due to improved varieties over check was highest in NHZ (23.94%) followed by NEPZ (21.55%), CZ (15.67%), PZ (10.43%) and NWPZ (08.07%) (Table 8b). Concerted efforts are needed to be made by the developmental agencies in all zones to bridge yield gap.

Table 8b: Zone wise productivity under FLDs over check during rabi 2019-20

Zone	Mean yield (q/ha)		Gain (in %)
	WFLDs	Check	
NHZ	29.98	24.19	23.94***
NEPZ	38.47	31.65	21.55***
NWPZ	51.85	47.98	08.07***
CZ	49.61	42.89	15.67***
PZ	31.97	28.95	10.43***

*** Significant at 1 percent level

The location specific highest average varietal yield (Table 9) attained in a zone were; HI 8759 (d) (77.00 q/ha) at Indore centre in CZ, DBW 187 (74.00 q/ha) at Shamli in NWPZ, DBW 187 (62.50 q/ha) at Ayodhya in NEPZ, MACS 6478 (57.50 q/ha) at Pune in PZ and VL 967 (45.00 q/ha) at Almora in NHZ (Table 9).

Table 9: Highest average yield attained by wheat variety in various zones during *rabi* 2019-20

Zone	Centre	Variety	Yield (q/ha)
NHZ	Almora	VL 967	45.00
NEPZ	Ayodhya	DBW 187	62.50
NWPZ	Shamli	DBW 187	74.00
CZ	Indore	HI 8759 (d)	77.00
PZ	Pune	MACS 6478	57.50

FLDs on bio-fertilizer (Azotobactor and PSB) along with 100% inorganic fertilizer as compared to check (100% recommended dose of inorganic fertilizer) showed that the yield gain was 30.19% at Shillongani center in NEPZ, although it was non-significant. In NWPZ, significant yield gain of 7.60% and 4.08% was recorded at Bijnor and Hisar centers, respectively. In CZ 13.98% and 8.03% significant yield gain was recorded at Jagdalpur Bastar and Kota centers respectively (Table 10).

Table 10: Yield gain through bio-fertilizer during *rabi* 2019-20

Zone & Centre	100 % Inorganic + Bio-fertilizer (Azotobactor + PSB)		100 % Inorganic fertilizer		% Gain
	Variety	Mean yield (q/ha)	Variety	Mean yield (q/ha)	
NEPZ					
Shillongani	DBW 187	34.50	DBW 187	26.50	30.19 ^{NS}
Shillongani	HD 3086	33.75	HD 3086	27.00	25.00 ^{NS}
NWPZ					
Bijnor	HPBW 01	48.85	HPBW 01	45.40	07.60 ^{***}
Pantnagar	HPBW 01	50.40	HPBW 01	49.28	02.28 ^{NS}
Hisar	HPBW 01	57.57	HPBW 01	55.31	04.08 [*]
IARI, New Delhi	HD 3226	59.00	HD 3226	56.17	05.04 ^{NS}
CZ					
Kota	Raj 4238	55.69	Raj 4238	51.56	08.03 ^{***}
Vijapur	GW 1339 (d)	52.10	GW 1339 (d)	45.93	13.45 ^{NS}
Vijapur	GW 451	48.66	GW 451	43.06	13.00 ^{NS}
Jagdalpur Bastar	DBW 110	23.85	DBW 110	20.93	13.98 [*]

*** Significant at 1 per cent level, * Significant at 10 per cent level, NS is Non-significant

In case of improved durum varieties, the variety HI 8759 (d) gave a significant average yield of 67.60 q/ha at Indore centre in Central zone. In PZ, the variety MACS 3949 (d) gave an average yield of 40.00 q/ha at Pune center, though it was non-significant (Table 11).

Table 11: Performance of improved durum/ dicoccum varieties during *rabi* 2019-20

Zone & Center	Improved variety	Yield (q/ha)	Check variety	Yield (q/ha)	Gain (%)
CZ					
Udaipur	HD 4728 (d)	54.50	HI 8498 (d)	50.00	09.00 ^{NS}
Indore	HI 8737 (d)	59.33	HI 8498 (d)	48.67	21.92 ^{**}
Indore	HI 8759 (d)	67.60	HI 8663 (d)	53.40	26.59 ^{***}

Zone & Center	Improved variety	Yield (q/ha)	Check variety	Yield (q/ha)	Gain (%)
PZ					
Akola	MACS 3949 (d)	35.75	Lok 1	30.90	15.70***
Niphad	MACS 3949 (d)	38.18	Ajit 102	34.09	12.00***
Pune	MACS 3949 (d)	40.00	MACS 3125 (d)	32.50	23.08 ^{NS}
Dharwad	MACS 3949 (d)	31.25	DWR 2006	30.00	04.17 ^{NS}
Dharwad	MACS 3949 (d)	33.75	Keerti	32.50	03.85 ^{NS}
Dharwad	MACS 3949 (d)	32.29	UAS 415 (d)	30.94	04.38 ^{NS}
Dharwad	UAS 428 (d)	37.50	DWR 1006	35.00	07.14 ^{NS}
Dharwad	UAS 446 (d)	14.21	B. Yellow (d)	12.50	13.67 ^{NS}
Indi Vijayapura	MACS 3949 (d)	26.58	Ankur	26.20	01.43 ^{NS}
Wellington	HW 1098 (dic.)	24.18	-	-	-

*** Significant at 1 per cent level, ** Significant at 5 per cent level, NS is Non-significant

In NHZ, at Almora, improved rainfed variety VL 967 yielded 37.17 q/ha which was significantly higher than the check variety. The variety HS 542 gave significantly higher yield of 33.58 q/ha and 30.28 q/ha at Khudwani and Rajouri centers, respectively. In CZ, DBW 110 gave 71.40 q/ha yield at Vijapur center which was significantly higher than the check variety. In PZ, NIAW 3170 yielded 41.90 q/ha under rainfed condition at Niphad centre which was significant (Table 12).

Table 12: Performance of improved varieties under rainfed/restricted irrigation conditions during rabi 2019-20

Zone & Center	Improved variety	Mean yield (q/ha)	Check variety	Mean yield (q/ha)	Gain (%)
NHZ					
Almora	VL 967	37.17	Local	30.23	22.93***
Bajaura	HS 542	29.73	HS 507	25.30	17.49***
Malan	HS 542	29.73	HPW 349	26.70	11.33***
Bilaspur	HS 542	25.00	HPW 155	14.93	67.41***
Shimla	HS 542	31.85	HS 507	28.50	11.75 ^{NS}
Chamba	HS 542	22.59	HPW 236	16.12	40.15***
Khudwani	HS 542	33.58	SKW 355	29.72	12.98***
Rajouri	HS 542	30.28	VL 829	24.83	21.95**
Hamirpur	HPW 368	22.5	Local	17.16	31.15***
Hamirpur	HS 542	20.46	Local	17.18	19.14***
Imphal	HS 542	16.75	K 7410	10.50	59.52***
CZ					
Banswara	DBW 110	43.05	Raj 4120	38.44	11.99***
Indore	HI 1605	51.25	HI 1531	35.75	43.36**
Panna	DBW 110	34.10	JW 3211	29.30	16.38***
Tikamgarh	DBW 110	40.58	GW 322	35.69	13.72***
Neemach	DBW 110	68.48	Lok 1	60.40	13.38***
Mandsaur	DBW 110	62.08	Lok 1	55.93	11.00***
Ujjain	DBW 110	71.40	HI 1544	61.50	16.10***
Harda	DBW 110	54.20	GW 322	49.34	09.85**
Jagdulpur	DBW 110	25.45	Lok 1	18.14	40.27***
PZ					
Niphad	NIAW 3170	41.90	NIAW 1994	36.45	14.95***
Dharwad	UAS 347	14.56	Local	11.72	24.27**
Dharwad	UAS 375	13.78	Local	12.43	10.89***
Wellington	HW 5207	24.00	-	-	-

*** Significant at 1 per cent level, ** Significant at 5 per cent level, * Significant at 10 per cent level, NS is Non-significant

A significant yield gain of 10.19% at coochbehar centre was observed in NEPZ under zero tillage of wheat sowing. In NWPZ, zero tillage gave the significant yield advantage of 11.48% and 07.75% at IIWBR Karnal center. The yield gain due to zero tillage technology was non significant at most of the centres (Table 13).

Table 13: Performance of zero tillage/happy seeder during rabi 2019-20

Zone & Centre	Technology	Improved varieties	Zero Tillage/ Happy Seeder mean yield (q/ha)	Check varieties	Conventional tillage mean yield (q/ha)	Gain (%)
NEPZ						
Sidharthnagar	Happy Seeder	DBW 187	43.40	DBW 187	39.50	09.87 ^{NS}
Sidharthnagar	Happy Seeder	HD 3086	42.29	HD 3086	41.60	01.65 ^{NS}
Sidharthnagar	Zero Tillage	DBW 187	32.00	DBW 187	28.75	10.16 ^{NS}
Sidharthnagar	Zero Tillage	HD 3086	41.31	HD 3086	41.06	00.61 ^{NS}
Coochbehar	Zero Tillage	DBW 187	37.10	DBW 187	34.70	06.92 ^{**}
Coochbehar	Zero Tillage	HD 3086	38.57	HD 3086	35.00	10.19 ^{***}
Shillongani	Zero Tillage	HD 3086	33.75	HD 3086	25.00	35.00 ^{NS}
Morabadi	Zero Tillage	HD 3086	33.79	HD 3086	31.65	06.78 [*]
NWPZ						
Ludhiana	Happy Seeder	PBW 677	57.75	PBW 677	56.00	03.13 ^{NS}
Ludhiana	Zero Tillage	HPBW 01	60.38	HPBW 01	56.88	06.15 ^{NS}
Ludhiana	Zero Tillage	PBW 677	58.50	PBW 677	55.00	06.36 ^{NS}
Pantnagar	Zero Tillage	HD 3226	52.08	HD 3226	53.08	-01.88 ^{NS}
IARI, New Delhi	Zero Tillage	HD 3226	58.13	HD 3226	56.25	03.33 ^{NS}
IIWBR, Karnal	Happy Seeder	DBW 187	62.19	DBW 187	55.78	11.48 ^{***}
IIWBR, Karnal	Happy Seeder	HD 3226	57.92	HD 3226	53.75	07.75 ^{**}
IIWBR, Karnal	Happy Seeder	HPBW 01	48.75	HPBW 01	47.50	02.63 ^{NS}
IIWBR, Karnal	Zero Tillage	DBW 187	66.63	DBW 187	64.25	03.70 ^{NS}
IIWBR, Karnal	Zero Tillage	HD 3226	56.67	HD 3226	52.50	07.94 ^{NS}
IIWBR, Karnal	Zero Tillage	HPBW 01	50.25	HPBW 01	48.50	03.61 ^{NS}
Hisar	Happy Seeder	HD 3226	57.57	HD 3226	56.39	02.10 ^{NS}
Ambala	Happy Seeder	HD 3226	53.58	HD 3226	51.17	04.72 ^{NS}
Ambala	Happy Seeder	HPBW 01	53.75	HPBW 01	52.50	02.38 ^{NS}
Ambala	Zero Tillage	HD 3226	53.75	HD 3226	52.50	02.38 ^{NS}
Kaithal	Happy Seeder	HD 3226	56.00	HD 3226	55.00	01.82 ^{NS}
Kaithal	Happy Seeder	HD 3226	58.00	HD 3226	56.00	03.57 ^{NS}
Kaithal	Zero Tillage	HD 3226	55.75	HD 3226	54.75	01.83 ^{***}
Kaithal	Zero Tillage	HPBW 01	56.50	HPBW 01	54.50	03.67 ^{NS}

*** Significant at 1 per cent level, ** Significant at 5 per cent level, * Significant at 10 per cent level, NS is Non-significant

Yield gain under rotavator technology was 05.65% at Bijnor which was significantly higher than conventional tillage. At other centers, it was non-significant (Table 14).

Table 14: Performance of rotavator during rabi 2019-20

Zone & Centre	Improved varieties	Rotavator mean yield (q/ha)	Conventional tillage mean yield (q/ha)	Gain (%)
NEPZ				
Sidharthnagar	HD 3086	40.38	40.13	00.62 ^{NS}
NWPZ				
Ludhiana	HPBW 01	54.00	52.63	02.61 ^{NS}
Ludhiana	PBW 677	57.88	55.75	03.81 ^{NS}
Gurdaspur	PBW 725	47.50	42.50	11.76 ^{NS}
Gurdaspur	Unnat PBW 343	45.00	41.25	09.09 ^{NS}

Zone & Centre	Improved varieties	Rotavator mean yield (q/ha)	Conventional tillage mean yield (q/ha)	Gain (%)
Bijnor	HD 3226	46.95	44.44	05.65***
Pantnagar	HD 3226	58.19	58.75	-00.96 ^{NS}
Ambala	HD 3226	49.85	48.55	02.68 ^{NS}
Ambala	HPBW 01	47.50	44.40	06.99 ^{NS}
Kaithal	HD 3226	54.00	53.00	01.89 ^{NS}
Kaithal	HPBW 01	56.00	55.00	01.82 ^{NS}

*** Significant at 1 per cent level, NS is Non-significant

Yield gain due to micro irrigations was non-significant at Vijapur center (Table 15).

Table 15: Yield gain through sprinkler irrigation/drip irrigation technology during rabi 2019-20

Zone & Centre	Improved variety	Mean Yield (q/ha)	Check variety	Mean yield (q/ha)	Gain (%)
CZ					
Vijapur (Sprinkler irrigation)	GW 451	52.50	GW 451	46.06	13.98 ^{NS}
Vijapur (Drip irrigation)	GW 1339 (d)	46.18	GW 1339 (d)	41.50	11.27 ^{NS}

NS is Non-significant

Performance of salt tolerant variety KRL 210 was better in NWPZ, but in yield terms it was statistically non-significant (Table 16).

Table 16: Performance of salt tolerant varieties during rabi 2019-20

Zone & Centre	Improved variety	Mean Yield (q/ha)	Check variety	Mean yield (q/ha)	Gain (%)
NWPZ					
CSSRI, Karnal	KRL 210	43.12	HD 2967	41.35	04.29 ^{NS}

NS is Non-significant

Suggestions by the cooperating centers of different zones for the smooth conduct of wheat FLDs

Suggestions	Zone				
	NHZ	NEPZ	NWPZ	CZ	PZ
• Release of funds should be before the start of sowing	√	√	√	√	√
• Supply of seeds should be before time	√	√	√	√	√
• Supply of treated seeds should be ensured	√	√	√		
• Increase budget on POL/hiring of vehicle for monitoring of FLDs, organization of field day and display boards	√	√	√	√	√
• Late sown and limited irrigated conditions varieties should also be included	√	√		√	√
• Incorporate short duration, less water requiring and heat tolerant varieties.		√		√	√
• In place of cluster approach individual farmer approach will be more appropriate.	√	√			
• Increase number of demonstration per centre	√	√	√	√	√
• Training on latest production technologies for different centres should be organised under FLDs programme	√	√	√		√
• There must be flexibility in expenditure of funds as per the requirements of the FLD centres	√	√	√	√	√
• Promote more than one variety in a crop season		√		√	
• There must be freedom of centres to use their own varieties under FLDs		√	√	√	

Suggestions by the cooperating centers of different zones for the smooth conduct of barley FLDs

Suggestions	Zone		
	NEPZ	NWPZ	CZ
• Release of funds well in advance	√	√	√
• Provision of additional fund for organizing field day and for POL	√	√	√
• Increase budget for POL/hiring of vehicle for monitoring of FLD sites and organizing field day	√	√	√
• Number of demonstrations should be increased		√	√
• Include barley varieties suitable for limited irrigation condition under FLD.	√		√
• Provision of funds for training and extension literature should also be made	√	√	√

Farmers' perception about FLDs

- Farmers were highly satisfied with performance of improved wheat & barley technologies under FLDs. The improved varieties outperformed check varieties across locations.
- Farmers were highly satisfied with the performance of zero tillage technology sowing as it saves time, labour, money and energy. This technology is also capable of *in situ* management rice stubbles.
- Farmers were highly convinced with the benefits of seed treatment with bio-fertilizers (Azotobactor and Phosphorus Solubilizing Bacteria) and were motivated to adopt it at their own in coming seasons.
- Neighboring farmers were enthusiastic to adopt technologies which were demonstrated in their vicinity and they have asked for seeds of improved variety from the FLD farmer.
- All the farmers were highly satisfied with the yield advantage of different technologies at their field and with their increased income due to more yield.

Monitoring of Frontline Demonstrations (FLDs)

The ICAR-IIWBR team accompanied by the experts from the Ministry of Agriculture & Farmers Welfare and the concerned centres monitored the following FLDs centres during the crop season 2019-20.

Team Leader	Centres Monitored	Dates of Monitoring
Dr. Satyavir Singh	Niphad Nasik and Pune	6-7 March, 2020
Dr. Anil Khippal	Imphal, Kalyani, Wellington and Dharwad	24-27 February and 12-15 March, 2020
Dr. Raj Pal Meena	Meerut, Shamli, Saharanpur and Muzaffarnagar	11-13 March, 2020
Dr. Sendhil R.	Bilaspur and Jagdalpur	4-7 March, 2020
Dr. Mangal Singh	Kanke Ranchi, Morabadi and Pusa	17-20 March, 2020
Dr. Ramesh Chand	Rewa, Panna and Jabalpur	26-28 February, 2020

Monitoring Centre: Niphad, Nashik (Maharashtra)

Monitoring Date: 06.03.2020

Monitoring Team

Dr. Satyavir Singh, Principal Scientist & PI (SS), ICAR-IIWBR, Karnal (Haryana).

Dr. SC Wadile, Assistant Professor (Agronomy), ARS (MPKV), Niphad, Nashik (Maharashtra).

- The team visited the wheat FLDs on 6th March, 2020 conducted by ARS (MPKV) Niphad, Nashik center at villages Niphad, Wakad and Dahivadi in district Nashik using variety NIAW 3170. The improved or newly released wheat variety (NRWV) with complete package of practices was demonstrated at farmers' fields.

Monitoring Centre: Pune (Maharashtra)

Monitoring Date: 07.03.2020

Monitoring Team

Dr. Satyavir Singh, Principal Scientist & PI (SS), ICAR-IIWBR, Karnal (Haryana).

Dr. Yashwant Kumar K.J., Incharge AICRP and Wheat Breeder, MACR-ARI, Pune (Maharashtra).

Dr. Vijendra Shantaram Baviskar, Junior Wheat Agronomist, MACS-ARI, Pune (Maharashtra).

Dr. Sudhir Navathe, Plant Pathologist, MACS-ARI, Pune (Maharashtra).

Dr. A.M. Chavan, Farm Manager, Hol Farm, MACS-ARI, Pune (Maharashtra).

- The team visited the wheat FLDs on 7th March, 2020 conducted by MACS-ARI, Pune (Maharashtra) center at villages Hol, Sortewadi, Chaudharwadi and Malegaon in district Pune using varieties MACS 6478 and MACS 3949 (d). The technology i.e. improved or newly released wheat varieties (NRWV) with complete package of practices was demonstrated at farmers' fields.
- The weeds infestation in FLDs was negligible. The wheat FLDs crop was free from diseases. New wheat varieties have good tillering good crop stand, long earhead, more number of grains per earhead and bold grains. Wheat straw is good for domestic animals. The improved wheat varieties being popularized were NIAW 3170, MACS 6478 and MACS 3949 (d). The check varieties being used were NIAW 1994 (*Phule Samadhan*), Ajit 102 and HD 2189. The neighbour farmers of the wheat FLDs were impressed by the performance of new varieties.

- No lodging was seen in new varieties fields. Farmers expected more yield from the new varieties than the old varieties. FLD is good source of technology transfer. The farmers appreciated the work done by FLDs co-operators.

Monitoring Centre: BTC College of Agriculture & Research Station, IGKV, Bilaspur

Monitoring Date: 04-06.03.2020

Monitoring Team

Dr. Sendhil R, Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. A.P. Agrawal, Principal Scientist (PB&G), BTC CoA & RS (IGKV), Bilaspur (CG)

Dr. Dinesh Pandey, Scientist (Agronomy) BTC CoA & RS, IGKV Bilaspur

Dr. Sandip Silawat, Senior Technical Assistant, Directorate of Pulses Development, Bhopal (MP)

- Improved or newly released wheat varieties viz., CG 1018 (Chhattisgarh Amber Wheat) & HI 8759 (d) were demonstrated in 25 acres of land at various farmers' fields against the check variety (GW 273). All the FLDs were conducted in Bhelwapapara village of Kota block in Chhattisgarh. The following observations were made during the overall monitoring (4-5 March, 2020) and discussion with the beneficiaries of FLD conducted by the BTC CoA & RS (IGKV), Bilaspur Centre.
- Out of 25 beneficiaries (SC farmers), 10 wheat FLD plots were monitored by the above team.
- As per the site visit of the beneficiaries' field, majority of the crop was at the harvesting stage with evident crop canopy in demonstrated plots against the check plots.
- A majority of the farmers used the recommended seed rate and opted line sowing. Though the demonstrated varieties were advocated for timely sown, farmers opted for late sown owing to late harvest of rice which is expected to hamper the realised yield level in the region.
- Fertilizer nutrients were applied based on the recommended dose for the region. Mostly, it was a mix of Urea, DAP and MOP. Very few farmers used SSP. It was recommended for soil test based fertilizer application.
- One of the FLD beneficiaries (Sh. Shankar Lal, S/o Sh. Murit Lal) applied only fertilizers barring plant protection chemicals. The rest applied based on the incidence, mostly weeds.
- The monitored plots were not infested with any insect-pests and diseases.
- In some of the visited fields, higher weed infestation was found indicating the need for proper management practices.
- All the farmers reported that they have given 4-5 irrigations despite a good rainfall during the ongoing season.
- The crop growth was good in the region with handful tillers.
- Harvesting is expected to commence in a couple of weeks in the monitored plots and around 10-12 quintals per acre was their yield expectation.
- Farmers valued the demonstrations of new production technologies via FLDs as the improved varieties perform better and expected to give more yield than the local or check varieties. They highly appreciated the technical assistance and advisory offered by the BTC CoA & RS (IGKV), Bilaspur centre.

- The beneficiaries - majority of them are new cultivators of the crop - are interested to continue with the improved varieties of wheat cultivation.
- Apart from FLDs, the team monitored the demonstrations (5 plots) conducted under the TSP program funded by the MoA&FW.
- A 'Field Day' was also organised by the BTC CoA & RS, IGKV, Bilaspur Centre on 5th March, 2020 at the demonstrated village wherein around 70 farmers participated including the village sarpanch. The participants were enlightened about the recent practices of wheat production technologies.

Monitoring Centre: KVK Jagdalpur, Bastar (Chhatisgarh)

Monitoring Date: 07.03.2020

Monitoring Team

Dr. Sendhil R, Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. SK Nag, Senior Scientist (Agril. Eco) & Head KVK, Jagdalpur, Bastar (Chhattisgarh)

Dr. Swati Thakur Mirjha, Subject Matter Specialist, KVK Jagdalpur, Chhattisgarh

Dr. Sandip Silawat, Senior Technical Assistant, Directorate of Pulses Development, Bhopal (MP)

Dr. Adikant Pradhan, Senior Scientist (Agronomy), SG CoA & RS, Jagdalpur, Bastar(Chhattisgarh)

- Improved and newly released wheat variety DBW 110 was demonstrated in 18 acres of farmers' fields at multiple locations by the KVK Jagdalpur centre against local check like Lok1 to identify the impact of bio-fertilizer treatment demonstration barring the varietal influence.
- The following observations were made during the overall monitoring and discussion with the FLD beneficiaries'.
- Selection of beneficiaries had the combination and/or inclusive of male, female, general category, OBC and ST.
- Line sowing by seed drill was the most common practice witnessed in the demonstrated plots with the recommended seed rate.
- Some farmers have opted for broadcasting despite line sowing was the recommendation.
- Almost all farmers had done seed treatment before taking up sowing
- Around five irrigations were given to the crop amidst scarcity of water.
- The crop stand was good in most of the plots but in a few demonstrated plots, the tillers per plant were too low.
- Almost all the visited FLD sites were ready to harvest in a couple of days.
- Fertilizer nutrients were applied based on the recommended dose or level for the region and the monitoring team reiterated the farmers for soil test based application. Mostly, farmers opted a mix of Urea, DAP and MOP.
- There was no incidence of pests and diseases in the monitored plot(s) except one plot owned by Sh. Joshi, where shoot borer incidence was reported. *Medicago denticulata* weed was found in some visited fields.
- Though the demonstrated variety (DBW 110) were advocated for timely sown and restricted irrigation, a majority of the farmers opted for late sown owing to late harvest of rice which is expected to hamper the realised yield level.

- From FLDs, farmers expect yield around 10 quintals per acre and they doubt that the ongoing season would yield less than the past season owing to erratic weather.
- Technical assistance and advisories offered by the KVK Jagdalpur was much appreciated by the beneficiaries and they are interested to continue.

Monitoring Centre: CAU, Imphal (Manipur)

Monitoring Date: 24-26.02.2020

Monitoring Team

Dr. Anil Kumar Khippal, Principal Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. Samuel Jeberson, Scientist, CAU, Imphal (Manipur)

- Package technology of wheat was demonstrated (10 FLDs) at various sites. Seed rate used was higher being rainfed area. Majority of the demonstrated plots were nearby the main road and were line sown with a good crop stand. In few demonstrations, the line spacing was more than recommendation. The crop was at tillering stage at the time of visit. Irrigation was reported as a major issue in that region. Despite a good crop stand, a few fields were infested with weeds. Display board was found at majority of demonstrations. Farmers valued the demonstrations of new wheat production technologies via FLDs. Many farmers have sown wheat for the first time. They appreciated the technical assistance and advisories offered by the scientist of CAU, Imphal team. They were interested to continue wheat cultivation even if the assistance from FLD programme is stopped.

Monitoring Centre: Bidhan Chandra Krishi Viswavidyalaya, Kalyani (West Bengal)

Monitoring Date: 27.02.2020

Monitoring Team

Dr. Anil Kumar Khippal, Principal Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. Dhiman Mukherjee, Associate Professor (Agronomy), BCKV, Kalyani (West Bengal)

Dr. S.K. Dutta, STA, Directorate of Jute Development, Kolkata (West Bengal)

- The two varieties *ie* HD 3086 and DBW 187 were demonstrated at forty sites. Line sowing was adopted by all beneficiary farmers in demonstrated plots. In demonstrated plots, better crop stand, no lodging, compact and long ear head, more tillers and more number of grains per ear head were observed. Display boards were not at many sites. The monitored fields were infested with weeds and crop was at dough stage. Farmers were happy with the performance of new varieties. They appreciated the technical assistance and advisories offered by the scientist. They were interested to continue wheat cultivation even if the assistance from FLD programme is stopped.

Monitoring Centre: ICAR-IARI, Regional Station, Wellington (Tamil Nadu)

Monitoring Date: 12-13.03.2020

Monitoring Team

Dr. Anil Kumar Khippal, Principal Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. M. Sivasamy, Principal Scientist and Head, ICAR-IARI, RS, Wellington (Tamil Nadu)

Dr. Shabolu Srikant, STA, Directorate of Oilseeds Development, Hyderabad

Dr. P. Jayaprakash, Principal Scientist, ICAR-IARI, RS, Wellington (Tamil Nadu)

- A total of 26 demonstrations of improved wheat varieties (HW 1098 and HW 5207) in 50 acres have been carried out by the ICAR-IARI, RS, Wellington center mostly in new areas to promote wheat cultivation. Line sowing was followed but spacing was 45 cm at all the sites visited. Seeds were sown at recommended levels. The monitored fields were infested with weeds and manual weeding was under practice. The condition of the crop was good. There was no display board at any FLD site. A field day was organised at Department of Agronomy at FLD site in Tamil Nadu Agricultural University, Coimbatore. The importance of wheat growing and its package of practices was discussed in detail. The team is working very hard to promote wheat cultivation. The farmers highly appreciated the technical assistance and advisories offered by the ICAR-IARI, RS, Wellington centre and they are interested to continue growing of wheat with the improved varieties in the forthcoming years without any monetary assistance.

Monitoring Centre: UAS, Dharwad (Karnataka)

Monitoring Date: 14-15 March, 2020

Monitoring Team

Dr. Anil Kumar Khippal, Principal Scientist, ICAR-IIWBR, Karnal (Haryana)

Dr. Kumar D. Lamani, Agronomist (Wheat) and Incharge AICRP, UAS Dharwad (Karnataka)

Sh. S.S. Kagi, Technical Officer, Directorate of Oilseeds Development, Hyderabad

- Improved durum and bread wheat varieties and bio-fertilizer technology were demonstrated (50 FLDs) at various sites. Line sowing was practiced but spacing was more. Majority of the demonstrated plots were nearby the main road and with a good crop stand. The crop was at maturity and harvesting was expected to commence in a couple of days in the monitored plots. Weed population was also observed in some plots. Farmers appreciated the demonstrations of new wheat varieties and production technologies via FLDs as the new varieties perform better and expected to give more yield than the check varieties. They appreciated the technical assistance and advisories offered by the UAS, Dharwad team. They are interested to continue wheat cultivation even if the assistance from FLD programme is stopped.

Monitoring Centre: KVK, Rewa (Madhya Pradesh)

Monitoring Date: 26.02.2020

Monitoring Team

Dr. Ramesh Chand, ACTO, ICAR-IIWBR, Karnal (Haryana)

Dr. Samita Singh, Scientist (Agronomy), KVK, Rewa (MP)

Dr. Brajesh Kumar, Tiwari, Scientist Agronomy, KVK, Rewa (MP)

Sh. Sandeep Kumar Sharma, SMS (Agro-Meteorology), KVK, Rewa (MP)

- Improved and newly released six rowed barley variety RD 2899 was demonstrated by KVK Rewa centre in six farmers' fields in four acres area in villages Atla, Puraina, Khajuakala, Tehra and Bodabaag of District Rewa against the check varieties JD 58. The following observations were made during the FLD monitoring.
- During monitoring, it was observed that barley crop is excellent having good tillers and expected yield of RD 2899 may be 40-42 quintals/hectare at FLD sites.

- Almost all the farmers had timely sown the barley using seed drill in second fortnight of November and seed rate used was of 40 kg/acre.
- Number of irrigations varied from farmer to farmer and most of the farmers had applied 2-3 irrigations.
- Recommended fertilizer doses were used and condition of the crop was very good.
- Transportation of produce is difficult as Grain market is very far away.
- Some demonstrations were not on the Road.
- Farmers appreciated the technical assistance provided by the KVK Rewa Centre and the FLD farmers were interested to continue their barley production with the improved varieties in the forthcoming years.

Monitoring Centre: KVK, Panna (MP)

Monitoring Date: 27.02.2020

Monitoring Team

Dr. Ramesh Chand, ACTO, ICAR-IIWBR, Karnal (Haryana)

Dr. Ranvijay Pratap Singh, Scientist (Horticulture), KVK, Panna (MP)

Dr. Ritesh Bagora, Prog Assistant, Soil Science of KVK, Panna (MP)

Sh. Ramkumar Kushawa, State Agriculture Department, Panna (MP)

- The varieties demonstrated were DBW 110 (wheat) and RD2899 (barley) and were better than the check varieties and the farmers were very happy with the performance of both varieties.
- The wheat crop is in good condition and expected yield may range between 38 to 40 q/ha at FLDs field.
- Farmer had sown the varieties timely in second fortnight of November with the help of seed drill. Seed rate used under FLDs was 40 kg/acre.
- Number of irrigations varied in wheat and farmers had applied 2-3 irrigations.
- Crop was free from weed infestation, insect-pests and diseases.
- Recommended level of fertilizers was used and condition of the crops was very good.
- Grain market is very far away.
- The technical assistance provided by the KVK Panna was appreciated by the farmers and the FLD farmers were interested to continue with the improved varieties in the forthcoming years.
- FLDs farmers were interested in sharing of wheat seed among fellow farmers in the villages.

Monitoring Centre: JNKVV, Jabalpur (MP)

Monitoring Date: 28.02.2020.

Monitoring Team

Dr. Ramesh Chand, ACTO, ICAR-IIWBR, Karnal (Haryana)

Dr. Anil Kumar Singh, Scientist (Agronomy), KVK, Jabalpur (MP)

Dr. Shiv Hare, Scientist, Directorate of Pulses Development, Bhopal (MP)

- FLDs farmers were very happy with the performance of the wheat variety JW 3382 variety, the crop is excellent and the yield may range between 38 to 40 q/ha.

- Farmers had sown the wheat variety up to 20th November with the help of seed drill with seed rate of 40 kg/acre. Some farmers had used broadcast method of sowing against the recommended line sowing.
- Number of irrigations varied from farmer to farmer in wheat and farmers had applied 2-3 irrigations.
- Crop was free from weed and insect-pests infestation was negligible at FLDs site.
- Majority of the FLDs farmers had applied recommended dose of fertilizers and weedicides in FLDs.
- Beneficiaries appreciated the technical assistance provided by the KVK (JNKVV), Jabalpur and the FLD farmers are interested to continue with the improved varieties in the forthcoming years without any monetary/input assistance.
- Some demonstrations were not on the road as per guidelines.
- Horizontal extension (farmer to farmer) is expected as farmers' assured to share the seed of JW 3382 wheat variety among fellow farmers in the villages.
- Beneficiaries appreciated the technical assistance provided by the KVK, Jabalpur and JNKVV and the FLD farmers are interested to continue with the improved varieties.

Monitoring Centre: IIFSR, Meerut (UP)

Monitoring Date: 11.03.2020

Monitoring Team

Dr. Raj Pal Meena, Sr. Scientist (Agronomy), ICAR-IIWBR, Karnal (Haryana)

Dr. Mahesh Kumar (Joint Director), Directorate of Sugarcane Dev., Lucknow (UP)

Dr. Kushyal Singh (Sr. Scientist), ICAR-IIFSR, Meerut (UP)

Dr. PC Jat (Sr. Scientist), ICAR-IIFSR, Meerut (UP)

- The team visited Khanoda village of Meerut district on 11th March 2020 for monitoring of Wheat FLDs conducted by IIFSR, Meerut during *Rabi* season 2019-20.
- The centre conducted 6 FLDs of wheat over 10 acres area at 20 farmers' fields.
- The seed of improved wheat varieties *ie.* DBW 173 and HD 3226 were distributed to the beneficiary farmers and demonstrated with complete package of practices at farmers' fields.
- The check varieties of wheat were old varieties used by farmers in the area. In visited fields wheat crop was found in flowering and in milking stage.
- The sowing was done by broadcasting method and seed rate seemed to be in higher side resulting in higher plant population.
- Display boards were not found in demonstrated fields.
- The performance of FLD was very poor.
- No incidence of disease and insects-pests was observed in the demonstration plots.
- Weed infestation was not found in wheat FLDs.
- In the demonstration fields no incidence of crop lodging was observed.
- The farmers, especially young farmers were able to interact about the performance of demonstrated varieties, package of practices and aim of FLDs.

Monitoring Centre: KVK, Shamli (UP)**Monitoring Date: 12.03.2020****Monitoring Team***Dr. Raj Pal Meena, Sr. Scientist (Agronomy), ICAR-IIWBR, Karnal (Haryana)**Dr. Mahesh Kumar (Joint Director), Directorate of Sugarcane Dev., Lucknow (UP)**Dr. Vikas Kumar Malik, Scientist (Plant Breeding), KVK Shamli*

- The team visited Kabarout, Kheri, Gorani, Banat villages of Shamli district on 12th March 2020 for monitoring of Wheat FLDs conducted by KVK, Shamli during *Rabi* season 2019-20. The centre conducted 8 FLDs of wheat over 8 acres area at 8 farmers' fields. The seed of improved varieties *i.e.* DBW 187 and HPBW 01 (four demonstration of each variety) was distributed to the beneficiary farmers and demonstrated with complete package of practices at farmers' fields. The check varieties of wheat were old varieties used by farmers in the area. In visited fields, wheat crop found in flowering and in milking stage.
- The sowing was done by broadcasting method and seed rate seemed to be in higher side resulting in higher plant population.
- Display board was not found in demonstrated fields.
- The performance of FLD crop was fairly good.
- No incidence of disease and insects-pest was observed in the demonstration plots.
- Weed infestation was not found in wheat FLDs.
- In the demonstration fields, no incidence of crop lodging was observed.
- The farmers, especially young farmers were able to interact about the performance of demonstrated varieties, package of practices and aim of FLD's.

Monitoring Centre: KVK, Saharanpur (UP)**Monitoring Date: 12.03.2020****Monitoring Team***Dr. Raj Pal Meena, Sr. Scientist (Agronomy), ICAR-IIWBR, Karnal (Haryana)**Dr. Mahesh Kumar (Joint Director), Directorate of Sugarcane Dev., Lucknow (UP)**Dr. IK Kushwa, PC, KVK, Saharanpur (UP)*

- The team visited Bedadakalan, Bhaleshwalshpur, Nainkhadi villages of Saharanpur district on 12th March 2020 for monitoring of Wheat FLDs conducted by KVK, Saharanpur during *Rabi* season 2019-20. The centre conducted 20 FLDs of wheat over 4.8 hectares area at 27 farmers' fields. The seeds of improved wheat varieties *i.e.* HPBW 01 and HD 3226 were demonstrated with complete package of practices at farmers' fields. The check varieties of wheat were old varieties used by farmers in the area. In visited fields, wheat crop was found in flowering and in milking stage.
- The sowing was done by seed drill machine by few farmers and few farmers had sown wheat by broadcasting method.
- The performance of FLD crop was very good but with no display boards.
- No incidence of disease and insects-pests was observed in the demonstration plots.
- Weed infestation and lodging was not found in wheat FLDs. The farmers were very progressive and interactive having excellent knowledge of all aspects of agriculture.

Monitoring Centre: KVK, Muzafarnagar (UP)**Monitoring Date: 13.03.2020****Monitoring Team**

Dr. Raj Pal Meena, Sr. Scientist (Agronomy), ICAR-IIWBR, Karnal (Haryana)

Dr. Mahesh Kumar, Joint Director, Directorate of Sugarcane Dev., Lucknow (UP)

Dr. Shripal Rana, SMS, KVK, Muzafarnagar (UP)

- The team visited Badkali, Nunikhera of Muzafarnagar district on 13th March 2020 for monitoring of Wheat FLDs conducted by KVK, Muzafarnagar during *Rabi* season 2019-20. The centre conducted 20 FLDs of wheat over 15 acres area at 15 farmers' fields. The seed of improved varieties i.e. HPBW 01 and HD 3226 were distributed to the beneficiary farmers and demonstrated with complete package of practices at farmers' fields. The check varieties of wheat were old varieties, used by farmers in the area. In visited fields, wheat crop found in flowering and in milking stage.
- The sowing was done by seed drill machine by few farmers and few farmers had sown wheat by broadcasting method.
- Display boards were not found in demonstrated fields.
- The performance of FLD crop was very good.
- No incidence of disease and insects-pests was observed in the demonstration plots.
- Weed infestation was not found in wheat FLD's.
- In the demonstration fields no incidence of crop lodging was observed.
- The farmers were very progressive and interactive.

Monitoring Center: BAU, Kanke, Ranchi and KVK, Morabadi, Ranchi (Jharkhand)**Monitoring Date: 17-19.03.2020****Monitoring Team**

Dr. Mangal Singh, ACTO, ICAR-IIWBR, Karnal (Haryana)

Dr. Atul Kumar Singh, Assistant Director, DRD, Patna (Bihar)

Dr. Manoj Kumar Singh, Assistant Professor, KVK, Morabadi, Ranchi (Jharkhand)

Dr. Naiyer Ali, Assistant Professor, BAU, Kanke, Ranchi

- The team visited Lawagara, Sijhuwa, Saheda and Totambi villages of Ranchi district of Jharkhand during 17-19 March, 2020 for monitoring wheat FLDs conducted by KVK, Morabadi and BAU, Kanke, Ranchi. Both the centers conducted 40 wheat FLDs over 40 acres area at 40 farmers' fields. The seed of newly released wheat varieties HD 3086 and DBW 187 were distributed to the beneficiary farmers and demonstrated complete package of practices at farmers' fields.
- Wheat FLDs were found free from weeds.
- The monitored fields were found free from insect-pests and diseases.
- In the monitored fields, better crop stand was observed due to more tillering, lodging free, compact and long ear head and very good canopy cover and good harvesting was expected.
- The FLDs farmers expected that higher yield from the new variety in comparison to the existing check varieties.
- The farmers appreciated the work done by cooperating center.

Monitoring Center: Pusa, Samastipur (Bihar) centers

Monitoring Date: 20.03.2020

Monitoring Team

Dr. Mangal Singh, ACTO, ICAR-IIWBR, Karnal (Haryana)

Dr. Atul Kumar Singh, Assistant Director, DRD, Patna (Bihar)

Dr. Hasim Mohambad, Scientist, RS, ICAR-IARI, Pusa, Samastipur (Bihar)

- The team visited Dwarikanath village of district Samastipur, Bihar on 20.03.2020 for monitoring of Wheat FLDs conducted by RS, ICAR-IARI, Samastipur, Bihar. The center conducted 25 wheat FLDs over 25 acres area at 25 farmers' fields. The seed of newly released wheat varieties HD 3086 and DBW 187 were distributed and demonstrated with complete package of practices at farmer's fields.
- Wheat FLDs were found free from weeds.
- The monitored fields were found free from insect, pest and diseases.
- In the monitored fields better crop stand was observed due to more tillering, lodging free, compact and longer ear head with a very good canopy cover.
- The FLDs farmers expected that higher yield from the new variety in comparison to the existing check varieties.
- The farmers appreciated the work done by cooperating center.

Table 17: Improved and check wheat varieties at farmers' field in various zones during rabi 2019-20

Zone	Improved Varieties	Check Varieties
NHZ	VL 967, HS 542, HPW 368	HPW 155, HPW 236, HS 507, Local, HPW 349, SKW 355, VL 829, K 7410
NEPZ	DBW 187, HD 3086	HD 2967, PBW 502, HUW 468, PBW 154, HUW 234, HD 2733, PBW 343, UP 262, Sonalika, PBW 373, K 9107
NWPZ	DBW 187, HD 3226, KRL 210, DBW 173, HPBW 01, PBW 723 (Unnat PBW 343), PBW 677, PBW 725,	HD 2967, HD 3086, PBW 502, Raj 4079, Raj 3077, Raj 1482, Raj 4120, Raj 4037, KRL 210, WH 711, PBW 677, Unnat PBW 343, PBW 226, PBW 725, Super 303
CZ	DBW 110, Raj 4238, GW 451, HD 2987, MP 3382, HI 8737 (d), GW 499, HI 8759 (d), HD 4728 (d), HI 1544, HI 1605, CG 1018, GW 1339 (d)	Raj 4120, GW 496, Lok 1, GW 273, HI 1531, JW 3211, GW 322, HI 1544, Raj 4037, HI 8498 (d), HI 8663 (d)
PZ	NIAW 3170, NIAW 1994, MACS 6478, MACS 3949 (d), UAS 446 (d), UAS 347, UAS 428(d), UAS 304, UAS 375, HW 5207, HW 1098 (dic.), AKAW 4210-6	NIAW 1994, NIAW 301, HD 2189, MACS 3125 (d), Keerti, DWR 162, B.Yellow (d), Local, Lok 1, Ankur, Ajit 102, UAS 415 (d), DWR 1006, DWR 2006

Table 18: Zone wise distribution of popular wheat varieties during rabi 2019-20

Zone	Popular Wheat Varieties
NHZ	HPW 155, DBW 621-50, DBW 88, HD 2967, HD 3086, HPW 236, HPW 349, HPW 368, HS 507, HS 562, Local, PBW 154, Raj 3077, SKW 196, VL 829, VL 892, VL 907, VL 953
NEPZ	HD 2967, K 9107, CBW 38, DBW 39, HD 2733, HD 2824, HD 3086, HUW 234, HUW 468, K 1006, K 307, K 402, NW 5054, NW 1012, PBW 154, PBW 343, PBW 443, PBW 502, PBW 550, Sri Ram 303, Sri Ram 304, UP 262
NWPZ	HD 2967, HD 3086, DBW 16, DBW 17, DBW 187, HD 2851, HD 3226, HPBW 01, PBW 226, PBW 343, PBW 373, PBW 502, PBW 550, PBW 590, PBW 677, PBW 725, Raj 3077, Raj 3765, Raj 4037, Raj 4079, Raj 4120, Raj 4238, Super 303, Unnat PBW 343, UP 2526, WH 1105, WH 711,
CZ	GW 273, GW 322, GW 366, GW 496, GW 173, HD 8737 (d), HI 1544, HI 8498 (d), HI 8663 (d), HI 8713 (d), JW 1203, JW 3211, Lok 1, Pusa Mangal, Raj 3077, Raj 3765, Raj 4037, Raj 4079, Raj 4120, Raj 4079, Ratan
PZ	Ajit 102, Ajit 109, Amruth, Ankur, B. Yellow (d), COW W1, DWR 162, DWR 2006, HD 2189, Kedar, Kirti, Local, Lok 1, MACS 2496, MACS 3125 (d), MACS 6222, Mohan Wonder, NIAW 1994, NIAW 301, NIDW 295 (d), Tryambak

Wheat FLDs conducted at ICAR-IIWBR, Karnal centre

During *rabi* 2019-20, 20 acres wheat FLDs were conducted at twenty farmers' fields in the villages namely Ramba and Butana in Karnal district and villages Bid Amin, Fatuhpur, Mirzapur and Dabkheri in Kurukshetra district of Haryana state using varieties DBW 187, HD 3226 and HPBW 01. The demonstrations were conducted using happy seeder, zero tillage and conventional tillage technologies with complete package of practices and farmers were provided with the improved varieties seeds.

Constraints analysis in different wheat producing zones of India (2019-20)

Methodology: An inventory of constraints impeding wheat production in the country was developed after thorough review of literature and taking experts' opinion. Data were collected on a well designed pre-structured questionnaire mailed to all the cooperating centres conducting wheat FLDs. The responses were collected on a three-point continuum *viz*; most serious, serious and not serious. The scores were assigned as 2, 1, 0 for the most serious, serious and not serious constraints, respectively. Based on the total score for each constraint, the rank was assigned to ascertain the level of seriousness in production.

Northern Hills Zone (NHZ): In NHZ, small land holding, high cost of inputs, lack of irrigation facilities, *Phalaris minor* infestation, non-availability of labour, non availability of seeds of newly released varieties, untimely rain, yellow rust, imbalanced use of fertilizers and lodging were the major constraints faced by the farmers (Table 19).

Table19: Constraints in NHZ

(n=193)

NHZ	Score	Rank
Small land holding	335	I
High cost of inputs	289	II
Lack of irrigation facilities	285	III
<i>Phalaris minor</i>	277	IV
Non-availability of labour	258	V
Non-availability of seeds of newly released varieties	252	VI
Untimely rain	247	VII
Yellow rust	232	VIII
Imbalanced use of fertilizers	214	IX
Lodging	199	X

North Eastern Plains Zone (NEPZ): In this zone, high cost of inputs, non-availability of seeds of newly released varieties, lack of canal irrigation facility, low price of wheat, untimely rain, small land holdings, non-availability of labour, poor information delivery, poor participation in exposure visits arranged by state department of agriculture and *Chenopodium album* were identified as major constraints. Seed and variety replacement ratio is low in NEPZ as seeds are not easily available. Private seed growers are very few in number hence dependency on NSC and other government agency is very high. Due to non-availability of government procurement of wheat, the farmers are dependent on private traders and they are not offering good price. Hence there is a need to ensure marketing of wheat on MSP in this zone for better price realization and profitability of wheat cultivation.

Table 20: Constraints in NEPZ (n=373)

NEPZ	Score	Rank
High cost of inputs	507	I
Non-availability of seeds of newly released varieties	438	II
Lack of canal irrigation facility	368	III
Low price of wheat	353	IV
Untimely rain	342	V
Small land holdings	339	VI
Non-availability of labour	336	VII
Poor information delivery by state extension machinery	327	VIII
Poor participation in exposure visits arranged by state department of agriculture	325	IX
<i>Chenopodium album</i>	302	X

North Western Plains Zone (NWPZ): NWPZ is the most productive zone of the country. In this zone maximum procurement of wheat is done by FCI and other government agencies for different welfare schemes. In recent years infestation of wheat fields with *Phalaris minor* has emerged as a major constraint of the zone and farmers are unable to manage it due to resistance developed against certain herbicides (Table 21). High cost of inputs, decline in water table, small land holdings, non availability of labour and low price of wheat were also identified as major constraints of this zone.

Table 21: Constraints in NWPZ (n= 327)

NWPZ	Score	Rank
<i>Phalaris minor</i>	464	I
High cost of inputs	462	II
Decline in water table	354	III
Small land holding	340	IV
Non-availability of labour	292	V
Low price of wheat	290	VI
Higher customer hiring rate for field operations	276	VII
Untimely rain	252	VIII
Poor information delivery by state extension machinery	252	VIII
Lack of facility of canal irrigation	245	IX

Central Zone (CZ): In central zone, high cost of inputs, *Phalaris minor*, small land holding, lack of facility of canal irrigation, decline in water table and untimely rain were the major constraints faced by the farmers. This zone has been identified as export zone for quality wheat. The processing quality of wheat in this zone is better than that of NEPZ and NWPZ. The above said constraints need to be addressed seriously for more income (Table 22).

Peninsular Zone (PZ): In peninsular zone, high cost of inputs, non availability of seeds of newly released variety, low price of wheat, poor plant population, small land holding, lack of training facility and higher rate of custom hiring were the major constraints. For making wheat cultivation remunerative, there is a need to develop proper market. For better price realization farmers need to be educated about selling of their agricultural produce through e-NAM portal (Table 23).

Table 22: Constraints in CZ**(n=253)**

CZ	Score	Rank
High cost of inputs	321	I
<i>Phalaris minor</i>	247	II
Small land holding	245	III
Lack of facility of canal irrigation	230	IV
Decline in water table	224	V
Untimely rain	198	VI
Non-availability of labour	186	VII
Higher customer hiring rate for field operations	180	VIII
Poor participation in exposure visits arranged by state department of agriculture	168	IX
Low price of wheat	168	IX

Table 23: Constraints in PZ**(n=166)**

PZ	Score	Rank
High cost of inputs	188	I
Non-availability of seed of newly released variety	186	II
Low price of wheat	178	III
Poor/ low plant population	162	IV
Small land holding	160	V
Lack of training facility	158	VI
Higher customer hiring rate for field operations	152	VII
Erratic power supply	145	VIII
Non-availability of labour	130	IX
Imbalanced use of fertilizers	127	X

Overall Constraints: The overall analysis across zones revealed that high cost of inputs, small land holding, *Phalaris minor*, non-availability of labour, non-availability of seeds of newly released varieties, untimely rain, low price of wheat, lack of canal irrigation facility, decline in water table and higher custom hiring rate of land levelling, field preparation, sowing & harvesting were the major constraints of wheat production as identified under FLDs (Table 24). Farmers need to be educated and trained on recent wheat production technologies, complete package of practices and soil health management. There is a need of government intervention to ensure quality seeds as well as quality inputs. Farmers need to be updated on impact of climate change on wheat cultivation and what are the coping strategies they can adopt to mitigate it. The concept of conservation agriculture and adoption of resource conservation technologies at farmers' fields can be propagated at a larger scale. To ensure better price, farmers have to go for quality wheat production. There is a need to register wheat growers on e-NAM platform for selling of wheat. All the constraints need appropriate attention in order to increase wheat production in all major wheat producing zones of the country.

Table 24: Overall constraints impeding wheat production**(n=1251)**

Overall Constraints	Score	Rank
High cost of input	1767	I
Small land holding	1419	II
<i>Phalaris minor</i>	1287	III
Non-availability of labour	1202	IV
Non-availability of seeds of newly released varieties	1190	V
Untimely rain	1154	VI
Low price of wheat	1144	VII
Lack of canal irrigation facility	1137	VIII
Decline in water table	1097	IX
Higher customer hiring rate for field operations	1040	X

Barley Frontline Demonstrations (2019-2020)

During the *rabi* crop season 2019-20, 250 Barley Frontline Demonstrations (BFLDs) of one acre each were allotted to 21 cooperating centers all over India in six states namely, HP, UP, Punjab, Haryana, Rajasthan and MP. Out of these, 231 were conducted by 20 centers, covering 237 acres area of 251 farmers (Table 25a). Improved barley varieties with complete package of practices (irrigation management, nutrient management, weed control, seed treatment etc.) were demonstrated.

Table 25a: Centre wise distribution of barley FLDs during *rabi* 2019-20 (in acres)

S.No.	Zone and Centre	BFLDs Allotted	BFLDs Conducted	Area sown (acres)	No. of farmers/ locations
Northern Hills Zone (NHZ)					
1.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	12	5	5	7
2.	ICAR-IARI, RS, Amartara Cottage, Shimla (HP)	12	12	12	17
North Eastern Plains Zone (NEPZ)					
3.	NDUA&T, Kumarganj, Ayodhya (UP)	12	12	12	12
4.	KVK (IAS-BHU), Barkachha, Mirzapur (UP)	12	12	12	12
5.	CSAUA&T, Kanpur (UP)	12	12	12	12
6.	BHU, Varanasi (UP)	12	Not conducted	-	-
North Western Plains Zone (NWPZ)					
7.	PAU, Ludhiana (Punjab)	8	8	8	8
8.	KVK (PAU), Khokhar Khurd, Mansa (Punjab)	12	12	12	14
9.	CCSHAU, Hisar (Haryana)	12	12	12	12
10.	KVK (BB Ashram), Rampura, Rewari (Haryana)	12	12	12	12
11.	KVK (CCSHAU), Bhiwani (Haryana)	12	12	12	16
12.	RARI (SKNAU), Durgapura, Jaipur (Rajasthan)	16	16	16	16
13.	KVK (Pragati Trust), Tankarda, Chomu, Jaipur (Rajasthan)	10	10	12*	8
14.	KVK (AU-Kota), Akorashi, Dhindora, Hindauncity, Karauli (Rajasthan)	12	12	12	16
Central Zone (CZ)					
15.	RCOA (MPUA&T), Udaipur (Rajasthan)	12	12	12	12
16.	KVK (MPUA&T), Dhoinda, Rajasmand (Rajasthan)	12	12	12	12
17.	KVK (JNKVV), Kuthulia Farm, Rewa (MP)	12	12	12	15
18.	KVK (JNKVV), Purushottampur, Panna (MP)	12	12	16*	14
19.	KVK (JNKVV), Tikamgarh (MP)	12	12	12	12
20.	KVK (RVSKVV), Biaora, Rajgarh (MP)	12	12	12	12
21.	COA (JNKVV), Ganj Basoda, Vidisha (MP)	12	12	12	12
Total		250	231	237	251

* Area covered more than allotted which is restricted equal to allotted FLDs.

Table 25b: Centre wise distribution of barley FLDs during rabi 2019-20 (in hectares)

S.No.	Zone and Centre	BFLDs Allotted	BFLDs Conducted	Area sown (hectares)	No. of farmers/ locations
Northern Hills Zone (NHZ)					
1.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	4.8	2	2	7
2.	ICAR-IARI, RS, Amartara Cottage, Shimla (HP)	4.8	4.8	4.8	17
North Eastern Plains Zone (NEPZ)					
3.	NDUA&T, Kumarganj, Ayodhya (UP)	4.8	4.8	4.8	12
4.	KVK (IAS-BHU), Barkachha, Mirzapur (UP)	4.8	4.8	4.8	12
5.	CSAUA&T, Kanpur (UP)	4.8	4.8	4.8	12
6.	BHU, Varanasi (UP)	4.8	Not conducted	-	-
North Western Plains Zone (NWPZ)					
7.	PAU, Ludhiana (Punjab)	3.2	3.2	3.2	8
8.	KVK (PAU), Khokhar Khurd, Mansa (Punjab)	4.8	4.8	4.8	14
9.	CCSHAU, Hisar (Haryana)	4.8	4.8	4.8	12
10.	KVK (BB Ashram), Rampura, Rewari (Haryana)	4.8	4.8	4.8	12
11.	KVK (CCSHAU), Bhiwani (Haryana)	4.8	4.8	4.8	16
12.	RARI (SKNAU), Durgapura, Jaipur (Rajasthan)	6.4	6.4	6.4	16
13.	KVK (Pragati Trust), Tankarda, Chomu, Jaipur (Rajasthan)	4	4	4.8	8
14.	KVK (AU-Kota), Akorashi, Dhindora, Hindauncity, Karauli (Rajasthan)	4.8	4.8	4.8	16
Central Zone (CZ)					
15.	RCOA (MPUA&T), Udaipur (Rajasthan)	4.8	4.8	4.8	12
16.	KVK (MPUA&T), Dhoinda, Rajasmand (Rajasthan)	4.8	4.8	4.8	12
17.	KVK (JNKVV), Kuthulia Farm, Rewa (MP)	4.8	4.8	6.4	15
18.	KVK (JNKVV), Purushottampur, Panna (MP)	4.8	4.8	4.8	14
19.	KVK (JNKVV), Tikamgarh (MP)	4.8	4.8	4.8	12
20.	KVK (RVSKVV), Biaora, Kothi Bagh, Rajgarh (MP)	4.8	4.8	4.8	12
21.	COA (JNKVV), Ganj Basoda, Vidisha (MP)	4.8	4.8	4.8	12
Total		100	92.4	94.8	251

* Area covered more than allotted which is restricted equal to allotted FLDs.

Table 26a : State wise distribution of barley FLDs during rabi 2019-20 (in acres)

S.N.	State	BFLDs Allotted	BFLDs Conducted	Area Sown (acres)	No. of farmers/ Locations
1.	HP	24	17	17	24
2.	UP	48	36	36	36
3.	Punjab	20	20	20	22
4.	Haryana	36	36	36	40
5.	Rajasthan	62	62	64*	64
6.	MP	60	60	64*	65
Total		250	231	237	251

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

Table 26b: State wise distribution of barley FLDs during *rabi* 2019-20 (in hectares)

S.N.	State	BFLDs Allotted	BFLDs Conducted	Area Sown (hectares)	No. of Farmers/ Locations
1.	HP	9.6	6.8	06.8	24
2.	UP	19.2	14.4	14.4	36
3.	Punjab	8.0	8.0	8.0	22
4.	Haryana	14.4	14.4	14.4	40
5.	Rajasthan	24.8	24.8	25.6*	64
6.	MP	24.0	24.0	25.6*	65
Total		100	92.40	94.8	251

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

Table 27a: Zone wise distribution of barley FLDs during *rabi* 2019-20 (in acres)

S.N.	Zone	BFLDs Allotted	BFLDs Conducted	Area Sown (acres)	No. of Farmers/ Locations
1.	NHZ	24	17	17	24
2.	NEPZ	48	36	36	36
3.	NWPZ	94	94	96*	102
4.	CZ	84	84	88*	89
Total		250	231	237	251

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

Table 27b: Zone wise distribution of barley FLDs during *rabi* 2019-20 (in hectares)

Zone	BFLDs Allotted	BFLDs Conducted	Area sown (hectares)	No. of farmers/ locations
NHZ	9.6	6.8	6.8	24
NEPZ	19.2	14.4	14.4	36
NWPZ	37.6	37.6	38.4*	102
CZ	33.6	33.6	35.2*	89
Total	100	92.4	94.8	251

* Area covered more than allotted which is restricted to area equal to allotted FLDs.

The highest gain in barley yield was recorded in UP (31.05 %) followed by HP and MP (23.31). The lowest gain in yield was reported in Haryana (5.95 %) (Table 28).

Table 28 : State wise yield gain during *rabi* 2019-20

State	BFLDs yield (q/ha)	Check yield (q/ha)	Gain (%)
HP	25.93	21.03	23.31*
UP	42.43	32.38	31.05***
Punjab	44.13	39.72	11.10***
Haryana	47.96	45.26	05.95**
Rajasthan	55.01	49.15	11.92***
MP	36.09	29.27	23.31***

*** Significant at 1 per cent level, ** Significant at 5 percent level, NS is Non-significant

The yield gain due to improved varieties over regional mean yield was highest in NEPZ (36.39%) followed by NHZ (24.94 %), CZ (21.01%) and NWPZ (13.88 %) (Table 29).

Table 29: Zone wise productivity over regional during rabi 2019-20

Zone	BFLDs yield (q/ha)	Regional mean yield (q/ha)	Gain (%)
NHZ	25.93	20.75	24.94**
NEPZ	42.43	31.11	36.39***
NWPZ	52.82	46.38	13.88***
CZ	37.87	31.30	21.01***

*** Significant at 1 per cent level

The yield gain due to improved varieties over check mean yield was highest in NEPZ (31.05 %) followed by NHZ (23.31 %), CZ (19.55 %) and NWPZ (09.57 %) (Table 30). Therefore, efforts should be made to increase barley yield in the NEPZ and CZ by promoting recent barley production technologies in collaboration with the state department of agriculture.

Table 30: Zone wise productivity over check during rabi 2019-20

Zone	BFLDs yield (q/ha)	Check mean yield (q/ha)	Gain (%)
NHZ	25.93	21.03	23.31*
NEPZ	42.43	32.38	31.05***
NWPZ	52.82	48.21	09.57***
CZ	37.87	31.68	19.55***

*** Significant at 1 per cent level

Table 31: Centre wise performance of improved barley varieties during rabi 2019-20

Zone and Centre	BFLDs yield (q/ha)	Check yield (q/ha)	Gain (%)
NHZ			
Bajaura	28.35	22.55	25.72 NS
Shimla	23.50	19.50	20.51**
NEPZ			
Ayodhya	32.03	29.58	08.28***
Mirzapur	52.88	39.00	35.58***
Kanpur	42.40	28.55	48.51***
NWPZ			
Ludhiana	48.38	45.00	07.50 NS
Mansa	41.70	36.70	13.62***
Hisar	52.98	50.43	05.06*
Rewari	48.75	45.25	07.73***
Bhiwani	43.60	41.40	05.31*
Durgapura, Jaipur	65.15	61.25	06.37***
Chomu, Jaipur	56.28	47.78	17.79***
Karauli	62.90	54.43	15.57***
CZ			
Udaipur	45.18	41.50	08.86***
Rajasmand	39.95	34.55	15.63***
Rewa	31.18	24.38	27.90***
Panna	26.25	19.80	32.58***
Tikamgarh	31.18	25.78	20.95***
Rajgarh	42.50	36.75	15.65**
Vidisha	50.55	40.83	23.82***

*** Significant at 1 per cent level, ** Significant at 5 per cent level, * Significant at 10 per cent level, NS is Non-significant

The yield gain under barley FLD was highest at Kanpur (48.51%) centre followed by Mirzapur (35.58%), Panna (32.58%), Rewa (27.90%), Bajaura (25.72%), Vidisha (23.82%), Tikamgarh (20.95%), Shimla (20.51%) and Chomu Jaipur (17.79%) centers across the zones. The increase in yield due to improved varieties over check varieties at Hisar center was the lowest (05.06%) (Table 31).

In NHZ, BHS 400 was the highest yielding (30.58 q/ha) variety at Bajaura centre. In NEPZ, RD 2907 at Mirzapur (52.88 q/ha), RD 2907 at Durgapura (65.15 q/ha) in NWPZ and RD 2899 at Vidisha (50.55 q/ha) in CZ were the highest average yielding varieties (Table 32).

Table 32: Variety wise performance of improved barley varieties during rabi 2019-20

Zone and Centre	Improved variety	Average yield (q/ha)	Check variety	Average yield (q/ha)	Yield gain over check (%)
NHZ					
Bajaura	HBL 713	26.13	HBL 316	20.38	28.21 ^{NS}
Bajaura	BHS 400	30.58	HBL 316	24.73	23.66 ^{NS}
Shimla	BHS 380	23.50	Local	19.50	20.51 ^{**}
NEPZ					
Ayodhya	RD 2907	31.83	NDB 1	29.38	08.34 ^{***}
Ayodhya	RD 2907	33.13	NDB 2	30.63	08.16 ^{NS}
Mirzapur	RD 2907	52.88	K 125	39.00	35.59 ^{***}
Kanpur	RD 2907	42.50	K 508	28.75	47.83 ^{***}
Kanpur	RD 2907	42.30	K 560	28.33	49.31 ^{***}
NWPZ					
Ludhiana	RD 2907	48.38	PL 807	45.00	07.51 ^{NS}
Mansa	RD 2907	41.70	PL 807	36.70	13.62 ^{***}
Hisar	RD 2907	52.98	BH 393	50.43	05.06 [*]
Rewari	RD 2907	48.75	BH 393	45.25	07.73 ^{***}
Bhiwani	RD 2907	43.60	BH 393	41.40	05.31 ^{**}
Durgapura Jaipur	RD 2907	65.15	RD 2052	61.25	06.37 ^{***}
Chomu Jaipur	RD 2907	56.28	RD 2035	47.78	17.79 ^{***}
Karauli	RD 2907	62.90	RD 2035	54.43	15.56 ^{***}
CZ					
Udaipur	RD 2899	45.18	RD 2552	41.50	08.87 ^{***}
Rajasmand	RD 2899	39.95	Local	34.55	15.63 ^{***}
Rewa	RD 2899	31.18	JB 58	24.38	27.89 ^{***}
Panna	RD 2899	26.25	JB 58	19.80	32.58 ^{***}
Tikamgarh	RD 2899	31.18	JB 58	25.78	20.95 ^{***}
Rajgarh	RD 2899	42.50	Local	36.75	15.65 ^{**}
Vidisha	RD 2899	50.55	Local	40.83	23.81 ^{***}

*** Significant at 1 per cent level, ** Significant at 5 per cent level, * Significant at 10 per cent level, NS is Non-significant

It is evident from table 9 that varieties BHS 400 (30.58 q/ha), RD 2907 (56.68 q/ha), RD 2907 (67.50 q/ha) and RD 2899 (52.00 q/ha) performed better than other varieties at Bajaura, Mirzapur, Durgapura Jaipur and Vidisha centres in the NHZ, NEPZ, NWPZ and CZ, respectively (Table 33).

Table 33: Yield potential of barley varieties in different zones during rabi 2019-20

Zone	Centre	Variety	Yield (q/ha)
NHZ	Bajaura	BHS 400	30.58
NEPZ	Mirzapur	RD 2907	56.68
NWPZ	Durgapura Jaipur	RD 2907	67.50
CZ	Vidisha	RD 2899	52.00

Table 34: Barley varieties grown in different zones during rabi 2019-20

Zone	Improved varieties	Check varieties	Popular varieties in the region
NHZ	HBL 713, BHS 400, BHS 380	HBL 316, Local	Sonu, Dolma, HBL 276, HBL 316, Local
NEPZ	RD 2907	NDB 1, NDB 2, K 125 (Azad), K 508, K 560	K 125, K 409, K 508, K 551, K 560, K 1149, RD 2794, Jagriti, Manjula, NB-1, NB 2, NB 3
NWPZ	RD 2907	PL 807, BH 393, RD 2035, RD 2052	PL 807, BH 393, BH 902, BH 946, RD 2035, RD 2052, RD 2660, RD 2715, RD 2786, RD 2794
CZ	RD 2899	JB 58, RD 2552, Local	RD 2035, RD 2552, RD 2715, RD 2660, RD 2786, JB 1, JB 58, Local

Constraints analysis in different barley producing zones of India (2019-20)

Variation in yield levels among different states, farmers and farms leads to yield gap in different states and different zones. There are many reasons of this yield gap which need to be addressed for sustainable barley production. Through constraint analysis an effort has been made to identify the factors impeding barley production in different parts of the country. An inventory of constraints impeding barley production in the country was developed after thorough review of literature and taking experts' opinion. Data were collected on a well designed pre-structured questionnaire mailed to all the cooperating centres conducting barley FLDs. The responses were collected on a three-point continuum *viz*; most serious, serious and not serious. The scores were assigned as 2, 1, 0 for the most serious, serious and not serious constraints, respectively. Based on the total score, the level of seriousness for each constraint has been calculated and finally ranks were assigned.

NHZ: In northern hills zone, non-availability of seed of newly released varieties, small land holding, water stress, yellow rust, lack of knowledge among farmers about recent production technologies, late sowing, high cost of inputs, untimely rain, lack of irrigation facilities and poor information delivery by state extension machinery were identified as major constraints faced by the farmers (Table 35).

Table 35: Constraints in NHZ**(n=4)**

Constraints	Score	Rank
Non-availability of seed of newly released varieties	8	I
Small land holding	8	I
Water stress	6	II
Yellow rust	6	II
Lack of knowledge among farmers about recent production technologies	6	II
Late sowing	4	IV
High cost of inputs	4	IV
Untimely rain	4	IV
Lack of irrigation facilities	4	IV
Poor information delivery by state extension machinery	4	IV

NEPZ: In this zone, high cost of inputs, small land holding, untimely rain, imbalanced use of fertilizers, *Phalaris minor*, non availability of farm machinery, non-availability of labour, lack of land levelling facility, low price of barley and *Chenopodium album* were identified as major constraints (Table 36). There is a need to address these constraints to exploit the potential of eastern states for wheat production. Regarding technical constraints such as imbalanced use of fertilizers, farmers need to be made aware through awareness programmes, trainings about the use of fertilizers. Marketing of barley and good price realization is a great concern in NEPZ.

Table 36: Constraints in NEPZ**(n=24)**

Constraints	Score	Rank
High cost of inputs	48	I
Small land holding	47	II
Untimely rain	46	III
Imbalanced use of fertilizers	44	IV
<i>Phalaris minor</i>	42	V
Non availability of farm machinery	41	VI
Non-availability of labour	41	VI
Lack of land levelling facility	38	VII
Low price of barley	36	VIII
<i>Chenopodium album</i> (Bathua)	36	IX

NWPZ: Being the highest barley producing zone of the country there a need to address major constraints faced by the farmers of NWPZ. Under FLD programme resistance against herbicides was identified as the most serious constraint of this zone followed by high cost of inputs, decline in water table, low price of barley, low organic matter in the soil, small land holding, lack of canal irrigation facility, neel gai, low micro nutrient level in soil and non availability of labour (Table 37).

Table 37: Constraints in NWPZ**(n=102)**

Constraints	Score	Rank
Resistance against herbicides	204	I
High cost of inputs	166	II
Decline in water table	158	III
Low price of barley	142	IV
Low organic matter in the soil	114	V
Small land holding	114	V
Lack of facility of canal irrigation	108	VI
Neel gai	105	VII
Low micro nutrient level in soil	101	VIII
Non-availability of labour	99	IX

CZ: In central zone, resistance against herbicides, lack canal irrigation facility, decline in water table, high cost of inputs, low price of barley, higher custom hiring rate of land levelling, field preparation, sowing, harvesting and threshing, small land holding, lack of knowledge among farmers about recent technologies, poor quality of seeds and *Phalaris minor* were identified as major constraints (Table 38).

Table 38: Constraints in CZ**(n=93)**

Constraints	Score	Rank
Resistance against herbicides	174	I
Lack of facility of canal irrigation	96	II
Decline in water table	94	III
High cost of inputs	94	III
Low price of barley	91	IV
Higher custom hiring rate for field operations	83	V
Small land holding	71	VI
Lack of knowledge among farmers about recent technologies	71	VI
Poor quality of seeds	63	VII
<i>Phalaris minor</i>	60	VII

Major constraints impeding barley production in the country: Overall analysis of constraints in different zones clearly indicated that resistance against herbicides, high cost of inputs, decline in water table, low price of barley, lack of canal irrigation facility, small land holding, non availability of labour, temperature fluctuation during crop growth, higher custom hiring rates and *Phalaris minor* (Table 39) were the major constraints. It is evident from Table 39 that majority of the constraints are administrative in nature which require timely intervention by state department of agriculture. Some of the constraints are technical in nature and with awareness and skill up gradation of the farmers on weed management strategy these can be easily addressed.

Table 39: Overall constraints of barley production in the country (n=264)

Constraints	Score	Rank
Resistance against herbicides	402	I
High cost of inputs	312	II
Decline water table	290	III
Low price of barley grain	273	IV
Lack canal irrigation facility	254	V
Small land holding	241	VI
Non-availability of labour	208	VII
Temperature fluctuation during crop growth	203	VIII
Higher custom hiring rate for field operations	203	VIII
<i>Phalaris minor</i>	200	IX

Costs and Returns for Wheat and Barley FLDs vis-à-vis Check Plots

Profitability is one of the major factors influencing the adoption of any crop production technology. In this section, costs and returns analysis for wheat and barley FLDs have been attempted across regions for the improved production technologies that were tested in farmers' field during 2019-2020. Generally, in any economic study, total costs are discussed under two categories viz., variable costs and fixed costs, the widely adopted norm. Nevertheless, variable costs alone are reckoned to be the cost incurred by the farmers ignoring the fixed costs. In any economic analysis of farm business, the fixed costs should also be taken into consideration to arrive at total costs for computing the net income. However, in the present analysis only operational or variable costs were considered to know the profitability of technology adoption with the assumption of fixed costs remains same for the particular farm wherein technology has been demonstrated. Operational costs include expenditure incurred on labour, seeds, FYM, fertilizers, plant protection chemicals etc. The returns over variable costs give an idea of profitability accrued to the farmer after meeting all the working expenses. Cost of production was estimated to know the cost incurred in producing a unit quantity of crop output. Returns per rupee of investment were also worked out to know the comparative profitability for wheat and barley.

Primary data were collected by the cooperating centres from the selected farmers who were allotted with the FLDs. Personal interview and discussion method was adopted with the aid of pre-tested schedules designed exclusively for the purpose evaluating the technologies disseminated through FLDs. The data collected pertained to the *rabi* season 2019-2020. The communicated data were compiled and processed at the ICAR-Indian Institute of Wheat and Barley Research for further analysis and reporting. Every genuine effort was made by the FLD coordinators to collect realistic data from the FLD beneficiaries and inappropriate data reported from the cooperating centres/ delayed reporting were not included for the costs and returns analysis.

Costs and Returns for Wheat (FLDs vis-à-vis Check Plot)

Perusal of Table 40 indicates that on an average, wheat varieties or technologies demonstrated at farmers' field under the FLD program gave ₹2.78 per rupee of investment in comparison to the check varieties (₹2.47). A significant difference in returns per rupee of investment was noticed between the FLD and check plots across states, zones and technologies. The returns per rupee of investment from FLDs ranged from ₹3.74 (Gujarat) to ₹1.88 (Tamil Nadu) across states, ₹3.32 (CZ) to ₹2.38 (NHZ) across zones, and ₹3.71 (Happy Seeder) to ₹1.88 (Dicoccum wheat) across technologies. Surprisingly, Gujarat registered the highest returns per rupee of investment owing to the higher gross returns *i.e.*, ₹127562 per hectare during the 2019-2020 crop season. On the contrary, Tamil Nadu registered lowest returns per rupee of investment due to less gross returns owing to limited yield capacity in the region (₹29490 per hectare).

The profit per hectare in FLDs was highest in Gujarat (₹93444), followed by Madhya Pradesh (₹85402) and New Delhi (₹84547). The difference in profit levels between demonstration and check plots was highest in the case of Assam (₹18796 per hectare). Interestingly, operational costs in Bihar, Chhatisgarh, Gujarat, Haryana, Jharkhand and Karnataka were lower in demonstrations in comparison to the check plots. The probable reason for Haryana might be due to the demonstration of resource efficient CA techniques which reduced the operational costs, significantly. Estimates of cost of production indicated that the operational cost incurred in producing a unit quantity of output was least in Haryana (₹588 per quintal) owing to less operational costs and the likelihood of getting more yield being a progressive state located in the NWPZ. Among the wheat growing zones, the cost of production in the CZ was lowest (₹752 per quintal), which is due to relatively less operational costs in raising the crop and realized yield levels was more as well. CZ also realized a good return per rupee of investment at the demonstrated plots (₹3.32) which is mainly due to the increasing productivity especially in Madhya Pradesh, followed by less operational costs. Among technologies demonstrated at farmers' field, happy seeder gave the highest profit (₹87454/ha) and the least was observed for the dicoccum variety (₹13932), despite growing demand in south India. However, the results were not consistent across years, sites owing to testing of particular technology in different locations of diverse soil properties and managed by different farmers. Overall, by adopting a new wheat variety or production technology a farmer earns ₹63690/ha. Further, ₹707 have to be spent to produce a quintal of wheat through new technology against ₹798 (farmers practice: check plots).

Costs and Returns for Barley (FLDs vis-à-vis Check Plot)

Table 41 indicates that on an average, improved barley varieties demonstrated at farmers' field under the FLD program gave around 12 per cent profit per hectare in comparison to the check. A significant difference in returns per rupee of investment was noticed between the demonstration and check plots across states and zones. Uttar Pradesh registered the highest returns per rupee of investment (₹4.50) through demonstrations, followed by Punjab (₹3.58) and Haryana (₹2.58). The difference in returns per rupee of investment between demonstration and check plots for the crop season was highest in Uttar Pradesh, followed by Madhya Pradesh and Punjab.

Table 40: Costs and returns from wheat during 2019-2020

Particulars	Cost of Cultivation (₹/ha)						Returns per ₹ invested		Cost of Production (₹/Qtl)	
	Operational Costs		Gross Returns		Profit		FLD	Check	FLD	Check
	FLD	Check	FLD	Check	FLD	Check				
State										
Assam	30545	30532	76117	57128	45572	26596	2.49	1.87	1098	1471
Bihar	40787	41178	89353	77956	48566	36779	2.19	1.89	954	1125
Chhattisgarh	34282	36554	85629	70576	51347	34022	2.50	1.93	1133	1458
Gujarat	34118	34365	127562	111038	93444	76672	3.74	3.23	632	728
Haryana	30327	32250	112985	110965	82658	78715	3.73	3.44	588	657
Himachal Pradesh	28548	27933	72790	58921	44242	30988	2.55	2.11	1092	1371
Jammu & Kashmir	37723	37379	85631	77074	47908	39695	2.27	2.06	1084	1227
Jharkhand	37988	38015	87523	69234	49536	31219	2.30	1.82	1059	1401
Karnataka	30886	31196	68333	62720	37447	31524	2.21	2.01	1323	1446
Madhya Pradesh	31463	30352	116865	98223	85402	67871	3.71	3.24	653	742
Maharashtra	38717	38655	118936	101000	80220	62345	3.07	2.61	1035	1233
Manipur	15759	15759	49647	31122	33888	15363	3.15	1.97	971	1606
New Delhi	40566	39767	125112	132330	84547	92563	3.08	3.33	798	866
Punjab	37960	37183	118895	116589	80936	79406	3.13	3.14	732	751
Rajasthan	40976	40354	116947	110940	75970	70586	2.85	2.75	801	866
Tamil Nadu	15692	N.A	29490	N.A	13797	N.A	1.88	N.A	660	N.A
Uttar Pradesh	38890	38044	109099	95880	70208	57836	2.81	2.52	853	962
Uttarakhand	37752	36056	95080	86064	57328	50007	2.52	2.39	974	1123
West Bengal	41000	38159	97224	85670	56224	47511	2.37	2.25	1004	1086
Zone										
CZ	33843	33586	112307	98212	78465	64627	3.32	2.92	752	874
NEPZ	35923	35609	87427	72456	51504	36847	2.43	2.03	984	1219
NHZ	33570	32470	79907	66508	46338	34038	2.38	2.05	1139	1408
NWPZ	37952	37766	115915	109738	77963	71972	3.05	2.91	754	812
PZ	35275	35305	96406	83808	61131	48503	2.73	2.37	1166	1329
Technology										
Bio-fertilizer	36316	35513	106898	98210	70582	62696	2.94	2.77	852	922
Biofortified Wheat	39550	38733	117910	111666	78360	72933	2.98	2.88	796	846
Dicoccum	15792	N.A	29724	N.A	13932	N.A	1.88	N.A	673	N.A
Drip	37356	37850	104166	94237	66810	56386	2.79	2.49	819	923
Durum	33898	33595	97496	85419	63598	51824	2.88	2.54	1041	1107
Happy Seeder	32233	35582	119688	115732	87454	80150	3.71	3.25	630	721
Rotavator	37921	38079	110756	118193	72835	80114	2.92	3.10	755	786
Saline Tolerant Wheat	23403	23403	77747	74550	54344	51147	3.32	3.19	557	581
Sprinkler	37929	38423	117572	104127	79643	65704	3.10	2.71	733	844
Variety	35481	35130	95274	81368	59793	46238	2.69	2.32	963	1164
Zero Tillage	30629	32583	94191	92142	63562	59560	3.08	2.83	707	798
All Categories										
India	35729	35398	99419	87400	63690	52003	2.78	2.47	921	1086

The profit per hectare in FLDs was highest in Rajasthan (₹62654), followed by Uttar Pradesh (₹62269) and Punjab (₹60003). The difference in profit between FLD and check plots ranged from ₹22541 in Uttar Pradesh to ₹3155 in Haryana. Interestingly, operational costs in Uttar Pradesh were lower in FLDs than check plots. The valid reason might be reduction in the use of inputs based on the recommendation. The returns per rupee of investment across barley growing zones were highest in the NEPZ (₹4.50), followed by NWPZ (₹2.89) and CZ (₹2.29). Estimates of cost of production indicated that the cost incurred in producing a unit quantity of barley output was least (₹442 per quintal) in Uttar Pradesh owing to less operational costs coupled with increased yield levels.

Table 41: Costs and returns from barley during 2019-2020

Particulars	Cost of Cultivation (₹/ha)						Returns per ₹ invested		Cost of Production (₹/Qtl)	
	Operational Costs		Gross Returns		Profit		FLD	Check	FLD	Check
	FLD	Check	FLD	Check	FLD	Check				
State										
Haryana	32780	31249	84543	79856	51763	48608	2.58	2.56	700	706
Himachal Pradesh	29517	24675	63090	51913	33573	27238	2.14	2.10	1150	1197
Madhya Pradesh	31562	29228	73995	59635	42433	30407	2.34	2.04	923	1059
Punjab	23254	22760	83257	75019	60003	52259	3.58	3.30	537	588
Rajasthan	37572	36550	100226	90116	62654	53567	2.67	2.47	711	777
Uttar Pradesh	17792	19422	80061	59150	62269	39728	4.50	3.05	442	634
Zone										
CZ	32697	30807	75002	62430	42305	31623	2.29	2.03	904	1026
NEPZ	17792	19422	80061	59150	62269	39728	4.50	3.05	442	634
NHZ	29517	24675	63090	51913	33573	27238	2.14	2.10	1150	1197
NWPZ	33047	31855	95514	87446	62467	55590	2.89	2.75	636	671
Technology										
Improved Variety	30454	29377	84726	72873	54271	43496	2.78	2.48	716	809
All Categories										
India	30454	29377	84726	72873	54271	43496	2.78	2.48	716	809

Overall, the profit analysis on wheat and barley indicated that additional returns per hectare from FLDs was more than the check varieties by ₹11687 and ₹10776, respectively establishing the fact that FLDs carry the successful technologies from lab to land. For some beneficiaries it was found that the operational costs under check varieties were more than the FLDs. However, the present estimates are only the indicators for comparison within the current year and may not have a complete inter-year relevance as the demonstrations were conducted in different sites as well as by different farm households. Further, the difference in profit earned from wheat/barley cultivation is subject to farm-farmer-region specific conditions as it varies from case to case.

Technology Outreach Programme (2019-2020)

Mera Gaon Mera Gaurav Scheme at ICAR-IIWBR, Karnal

The activities of the governments flagship programme towards doubling of farmers' income, 'Mera Gaon Mera Gaurav' scheme were carried out on a large scale during the current crop season and all the teams visited their adopted villages and created awareness among the farmers on advanced practices of crop cultivation, provided seeds of PBW 723 (Unnat PBW 343) variety of wheat and conducted demonstrations at farmers' fields. Timely reports of monthly and quarterly activities were compiled at IIWBR and submitted to the Zonal Nodal Officer & Director, ICAR- Agricultural Technology Application Research Institute (ATARI), Zone-2, Jodhpur (Rajasthan), regularly. All the Fourteen teams of scientists of different disciplines have been constituted including four to five scientists. Out of these each of the twelve teams have selected five different villages, one team has selected four different villages, one team has selected one village.

Extension Activities

Training programmes organised/conducted at ICAR-IIWBR, Karnal

Date	Duration (days)	No of Trainees	Subject	Organised by
27-29 June, 2019	3	35 Agriculture Officers	Entrepreneurship Development in quality seed production, processing and marketing	Seed Project ICAR-IIWBR, Karnal
21-22 November, 2019	2	24 Farmers	Gehoon ki unnat kheti evam fasal vividhikaran dwara adhik amadani	ICAR-IIWBR, Karnal with State Department of Agriculture, Uttarakhand
5-8 December, 2019	4	700 Farmers	Barley for malting uses and cultivation of improved varieties	Rajasthan sponsored by AB In Bev India
17 December, 2019	1	100 Agriculture Officers and Farmers	Identification preventive measures of wheat blast and adoption strategies of resistant varieties	An off campus training organised at BCKV, Kalyani WB, sponsored by ICAR-IIWBR, Karnal
19-21 December, 2019	3	47 Farmers	Increasing farm income of Lahaul-Spiti farmers through improved wheat and vegetable production technologies	ICAR-IIWBR Regional Station, Dalang Maidan (HP) at IIWBR Karnal, Haryana under TSP Project
08 -10 January, 2020	3	37 Farmers	Gehoon evam jau ki unnat kheti	DDA Dehradun, Uttarakhand sponsored at IIWBR
12-13 January, 2020	2	3 Agri. Professionals	Fasal Avshesh Prabandhan	Faculty of Agriculture, Bhopal at ICAR-IIWBR, Karnal
20-22 January, 2020	3	37 farmers	Gehoon evam jau fasal me jal prabandhan dwara kisano ki aay me vriddhi	ICAR-IIWBR, Karnal

Organization/Participation in Exhibition

Date	Programme	Duration (Days)	Organised by
24-26 August, 2019	58 th All India Wheat and Barley Research Workers' Meet-2019	3	RS, ICAR-IARI, Indore, Madhya Pradesh
13 September, 2019.	Rabi Kisan Mela 2019	1	ICAR-CSSRI, Karnal at NetajiSubhash ChandraStadium, Palwal, Haryana
17 September, 2019	Kisan Mela 2019	1	Young Farmers Association, Rakhra, Patiala, Punjab
14 November, 2019	Ganna aur Makka Kisan Mela 2019	1	CCS-HAU, RRS, Uchani, Karnal, Haryana
22 January, 2020	Sustainable Wheat Production and Nutritional Security in India	1	Directorate of Wheat Development, Govt. of India, Ministry of Agriculture & Farmers Welfare DAC&FW at National Centre for Organic Farming, Kamla Nehru Nagar, Ghaziabad, Uttar Pradesh.
28-31 January 2020	Global Potato Conclave 2020	4	Indian Potato Association in collaboration with Indian Council of Agricultural Research, New Delhi and ICAR-Central Potato Research Institute at Mahatma Mandir, Gandhinagar, Gujarat.
06 February, 2020	Virat Kisan Mela 2020	1	Department of Agriculture, Baghpat at Samrat Prathviraj Degree College, Baghpat, Uttar Pradesh.
15-17 February, 2020	National Dairy Mela 2020	3	ICAR-National Dairy Research Institute, Karnal, Haryana
28-29 February, 2020	Ganna Vikas Mela 2020	2	ICAR-Sugarcane Breeding Institute, Regional Centre, Karnal, Haryana
3 March 2020	Rabi Kisan Mela	1	On the occasion of 2 nd Foundation Day of Gurbachan Singh Foundation, Kachhawa Road, Karnal
05-07 March, 2020	PusaKrishiVigyanMela 2020	3	ICAR-Indian Agricultural Research Institute, New Delhi at Mela Ground, IARI, New Delhi

Kisan Mela/Farmers Day/Field Day

Date	Occasion	Organised by
04.04.2019	Field Day at FLD Site in Bid Amin village, Kurukshetra, Haryana	ICAR-IIWBR, Karnal
05.10.2019	Farmer-Scientist Workshop and Seed Day	ICAR-IIWBR, Karnal
26.11.2019	70 th Constitution Day	ICAR-IIWBR, Karnal
03.12.2019	Agricultural Education Day at ICAR-IIWBR, Karnal, Haryana	ICAR-IIWBR, Karnal
05.12.2019	World Soil Day at Nabipur Village, Karnal, Haryana	ICAR - IIWBR, Karnal
28.12.2019	Sanitation Awareness Campaign at Nabipur Village, Karnal, Haryana	ICAR-IIWBR, Karnal
09.02.2020	6 th Foundation Day of ICAR-IIWBR, Karnal	ICAR-IIWBR, Karnal

Coordination of visits at ICAR-IIWBR, Karnal during 2019-20

S.No	Date	Number of visitors	From
1	January 03, 2019	36 Women Farmers	Raypipla, Narmada, Gujarat
2	January 09, 2019	46 Farmers	Sriganganagar, Rajasthan
3	January 10, 2019	26 Farmers	Azamgarh, Uttar Pradesh
4	January 14, 2019	60 Farmers	Amethi, Sultanpur, Uttar Pradesh
5	January 15, 2019	26 Women Farmers	Gurugram, Haryana
6	January 17, 2019	24 Farmers	Sriganganagar, Rajasthan
7	January 23, 2019	60 Students	Kutail, Karnal, Haryana
8	January 31, 2019	40 Farmers	Sriganganagar, Rajasthan
9	February 05, 2019	45 Farmers	Chhattisgarh
10	February 06, 2019	30 Farmers	Vidisha, Madhya Pradesh
11	February 11, 2019	32 Farmers	Ayodhya and Bareilly, Uttar Pradesh
12	February 14, 2019	35 Farmers	Churu, Rajasthan
13	February 20, 2019	16 Students	Nashik, Maharashtra
14	February 23, 2019	28 Farmers	Jhunjhunu, Rajasthan
15	March 02, 2019	25 Farmers	Kullu, Himacha Pradesh
16	March 05, 2019	32 Farmers	Churu, Rajasthan
17	March 06, 2019	100 Farmers	Nilokheri, Karnal
18	March 11, 2019	50 Farmers	Hapur, Uttar Pradesh
19	March 16, 2019	20 Farmer s	Jhunjhunu, Rajasthan
20	March 26, 2019	50 Students	Meerut, Uttar Pradesh
21	April 3, 2019	59 students	Bharatpur, Rajasthan
22	April 11, 2019	56 Farmers	Bharatpur, Rajasthan
23	April 13, 2019	152 Student	Ahmedabad, Gujarat
24	April 18, 2019	70 Farmers	Bharatpur, Rajasthan
25	April 20, 2019	86 Students	Rajpura, Punjab
26	April 26, 2019	55 Student	BaruShahab, H.P.
27	April 29, 2019	15 Students	Dehradun, Uttarahand
28	May 03, 2019	19 Students	Raipur, Chhattisgarh
29	June 11, 2019	46 Students	Jhansi, Uttar Pradesh
30	June 12, 2019	09 Students	Kyrdemkulai, Meghalaya
31	June 22, 2019	50 Students	Jodhpur, Rajasthan
32	July 01, 2019	55 Students	Kanpur, Uttar Pradesh
33	September 16, 2019	100 Students	Krishnagiri, Tamil Nadu
34	September 16, 2019	118 Students	Madurai, Tamil Nadu
35	September 18, 2019	65 Students	Karaikudi, Tamil Nadu
36	September 18, 2019	106 Student	Killikulam, Vallanadu, Tamil Nadu
37	September 21, 2019	34 Farmers	Nowshera, Rajouri, J&K
38	September 23, 2019	34 Students	Madurai, Tamil Nadu
39	September 24, 2019	38 Students	Sempuli, Tamil Nadu
40	September 27, 2019	36 Farmers	Bignor, Uttar Pradesh
41	September 30, 2019	25 Farmers	Madhya Pradesh
42	October 01, 2019	98 Students	Namakkal, Tamil Nadu
43	October 11, 2019	30 Students	Gwalior, Madhya Pradesh
44	October 13, 2019	42 Farmers	Basti, Uttar Pradesh
45	October 16, 2019	115 Student	Gujarat
46	October 18, 2019	63 Students	Gujarat
47	October 19, 2019	50 Students	Gujarat
48	October 19, 2019	32 Farmers	Gujarat

S.No	Date	Number of visitors	From
49	October 22, 2019	55 Students	Kalasalaya, Tamil Nadu
50	October 24, 2019	52 Students	Karnal
51	October 31, 2019	70 Farmers	J&K
52	November 11, 2019	32 Students	Jaipur, Rajasthan
53	November 12, 2019	42 Students	Kamuthi, Tamil Nadu
54	November 13, 2019	111 Students	Pollachi, Tamil Nadu
55	November 15, 2019	54 Students	Perambalur, Tamil Nadu
56	November 16, 2019	53 Students	Kaithal, Haryana
57	November 18, 2019	25 Fertilizer dealers	Jind, Haryana
58	November 18, 2019	71 Students	Periyakulam, Tamil Nadu
59	November 22, 2019	66 Students	Pudukkottai, Tamil Nadu
60	November 23, 2019	45 Farmers	Chhattisgarh
61	November 25, 2019	50 Farmers	Chhattisgarh
62	November 26, 2019	85 Students	Kalavai, Tamil Nadu
63	November 26, 2019	42 Students	Trichi, Tamil Nadu
64	November 29, 2019	49 Farmers	Chhattisgarh
65	November 29, 2019	81 Students	GB Nagar, Vellore, Tamil Nadu
66	December 02, 2019	28 Farmers	Dakshin, Dinapur, West Bengal
67	December 03, 2019	40 Students	Karnal, Haryana
68	December 09, 2019	50 Student	Kaithal, Haryana
69	December 09, 2019	81 Student	Kaithal, Haryana
70	December 10, 2019	30 Fertilizers dealers	HAU, Hisar, Haryana
71	December 17, 2019	45 Farmers	Chhattisgarh
72	December 23, 2019	50 Farmers	Chhattisgarh
73	December 17, 2019	115 Farmers	Coimbatore, Tamil Nadu
74	December 18, 2019	40 Farmers	Delhi
75	December 21, 2019	50 Farmers	Raipur, Chhattisgarh
76	December 22, 2019	42 Farmer	Raipur Chhattisgarh
77	December 23, 2019	28 Students	Dindigul, Tamil Nadu
78	January 16, 2020	40 Farmers	Gurugram, Haryana
79	January 22, 2020	47 Students	Pehowa, Kurukshetra
80	January 22, 2020	35 Farmers	Gujarat
81	January 24, 2020	35 Women farmers	Gujarat
82	January 27, 2020	50 Farmers	Uttar Pradesh
83	January 27, 2020	55 Farmers	Amethi, Uttar Pradesh
84	January 28, 2020	100 Farmers	Nilokheri, Haryana
85	January 30, 2020	100 Farmers	Asshandh, Haryana
86	February 10, 2020	21 Students	Rahuri, Maharashtra
87	February 13, 2020	20 Students	Uttar Pradesh
88	February 14, 2020	44 students	Karnal, Haryana
89	February 14, 2020	50 Farmers	Fatehpur, UP
90	February 17, 2020	50 Students	Kaithal, Haryana
91	February 17, 2020	50 Students	Maharashtra
92	February 25, 2020	28 Farmers	Sonipat, Haryana
93	March 04, 2020	41 Farmers	Raipur, Chhattisgarh
94	March 05, 2020	25 Farmers	Chhattisgarh
95	March 08, 2020	45 Farmers	Rajasthan
96	March 14, 2020	6 Farmers	Bulandshahar, UP
97	March 19, 2020	11 Farmers	Maharashtra

Lectures Delivered (Dr. Anuj Kumar)

Date	Topic
29.06.2019	Lecture on 'Formation of SHGs for Agri business' in Training programme on "Entrepreneurship Development in seed industry 27-27 June 2019 at ICAR-IIWBR, Karnal
24.07.2019	Lecture on 'How to win Markets for Dairy Products? The need for Strategic Planning, Implementation and Control' in Training Programme on Marketing Strategies for promotion of Dairy Products during 24-26 July 2019 at NDRI, Karnal sponsored by NIAM, Jaipur
27.08.2019	Lecture on 'Entrepreneurship in agri processing industries' in Training programme on "Extension Strategy for linking farmers to agri-processing industries" during 27-31 August, 2019 at EEI, Nilokheri
04.09.2019	Lecture on 'Wheat Product and Nutrition Security' during Insurance Week (1-7 September, 2019) at LIC Mandal Karyalaya, Model Town, Karnal
22.11.2019	Lecture on 'Gehoon Me Udyamita Vikas' in Training organised during 21-23 Nov. 2019 on "Gehoon ki Kheti Evam Fasal Vividhikaran Dwara Adhik Aamdani" at ICAR-IIWBR, Karnal sponsored by DDA Tihri, Uttarakhand.
09.01.2020	Lecture on 'Krishi Me Udyamita Vikas' in Training on "Gehoon Evam Jau Ki Unnat Kheti" during 8-10 January, 2020 at IIWBR, Karnal sponsored by DDA Dehradun, Uttarakhand.
21.01.2020	Lecture on 'Krishi Me Udyamita Vikas' in Training organised during 20-22 Jan., 2020 on "Gehoon Evam Jau Me Jal Prabandhan Dwara Kisano Ki Aay Me Vridhhi" at ICAR-IIWBR, Karnal
05.02.2020	Lecture on 'Effective Writing and Editing' in Training programme on "Documenting Success Stories during 3-7 February, 2020 at NDRI sponsored by MANAGE, Hyderabad
06.02.2020	Lecture on 'Motivational Skills and Leadership' in MTC on "Livelihood Security of farmers through technological interventions in salt affected soils" during 31 January to 7 February, 2020 at CSSRI Karnal.
15.02.2020	Lecture on 'Formation of FPO for Entrepreneurship in Seed Sector' in ICAR- short course during 06-15, February 2020 on "Participatory Seed Production of Rabi Crops for Entrepreneurial Development" at ICAR- IIWBR, Karnal.
17.02.2020	Lecture on 'Bhartiya Krishi Ke Vikas Me Bankon Ki Bhumika' in UKO Bank Mandal Karyalaya Karnal during GD Birla Memorial Vyakhyanmala.

Lectures Delivered (Dr. Sendhil R)

Date	Topic
04.09.2019	Delivered an invited presentation on "Wheat Production Technologies and Food Security: The Nexus and Prospects" at the National Conference on Ascertaining Food Security through Livelihood Enriching Interventions: Challenges and Opportunities held at PAJANCOA & RI, Karaikal, Puducherry Union Territory from 04-06 September, 2019.
20.09.2019	Delivered a lecture on "Price Risk Management in Agriculture Exploring Futures" during the Training Program on Innovative Marketing Practices for Enhancing Farmers Income in Salt Affected Regions held at ICAR-CSSRI, Karnal.
17.10.2019	Delivered a lecture on "Technology Development in Wheat and its Role in Farmers Income" during the CAFT program organized at Division of Agricultural Economics, ICAR-IARI.
	Delivered a lecture on "Principal Component Analysis based Indexing" during the CAFT program organized at Division of Agricultural Economics, ICAR-IARI.
18.10.2019	Delivered a lecture on "Farm Management: Records, Economics and Implications" during the workshop/training on Extension Strategy for Resource Management and Input Cost Reduction in Agriculture held at EEI, Nilokheri.
19.12.2019	Delivered a presentation for "Young Agricultural Economist (2019)" awarded by the Agricultural Economics Research Association (AERA) at the 27 th AERA Conference held at PAU, Ludhiana from December 17-19, 2019.

TV Programme (Telecast/shooting)

Date	Programme
05.12.2019	DD Kisan, Kisan Prashan Manch programme organised at Nabipur village, Karnal, Haryana
05.12.2019	DD Kisan, Ghumate–Phirte programme organised at Mehmadpur village, Karnal, Haryana
02.01.2020	DD Kisan Vichar-Vimarsh programme
19.02.2020	DD Kisan Vichar-Vimarsh programme on “Gehoon Fasal Ki Dekhbhal”

Awards

- ICAR-IIWBR was awarded with Best Exhibition Stall during Ganna Aur Makka Kisan Mela 2019 organized at CCSHAU, Uchani, Karnal, Haryana on 14th November, 2019.
- ICAR-IIWBR was awarded with Best Exhibition Stall during National Dairy Mela 2020 organized at ICAR-National Dairy Research Institute, Karnal, Haryana on 15-17 February, 2020.

Video Film

- A bilingual (Hindi and English) video film on profile of ‘ICAR-Indian Institute of Wheat and Barley Research, Karnal’ was completed during 2019.

Annexure-I : Categorywise number of wheat FLDs farmers during 2019-20

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
	NHZ															
1.	VPKAS, Almora (Uttarakhand)	18	18	18	18	2.35 (15)	1.75 (02)	-	8.80 (30)	2.10 (14)	-	-	3.0 (15)	12.90 (47)	5.10 (29)	18.0 (76)
2.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	12	12	12	12	10.10 (11)	-	-	0.90 (01)	1.00 (01)	-	-	-	11.00 (12)	1.0 (01)	12.0 (13)
3.	CSKHPKV, RWRC, Malan, Kangra (HP)	12	12	9	9	0.45 (01)	-	3.35 (05)	3.70 (03)	-	1.50 (01)	-	-	7.50 (09)	1.50 (01)	9.00 (10)
4.	KVK (CSKHPKV) and RSS, Berthin, Bilaspur (HP)	11	11	09	09	1.00 (01)	-	1.00 (01)	4.00 (04)	-	-	-	3.00 (03)	6.00 (06)	3.00 (03)	9.00 (09)
5.	CSKHPKV, HAREC, Dhaulakuan, Sirmour (HP)	10	10		NC	-	-	-	-	-	-	-	-	-	-	-
6.	IARI, RS, Amartara Cottage, Shimla (HP)	12	12	05	05	0.90 (02)	-	-	4.10 (12)	-	-	-	-	5.00 (14)	-	5.00 (14)
7.	KVK, Chamba (HP)	10	10	10	10	0.50 (02)	0.375 (02)	0.125 (01)	3.750 (09)	3.375 (07)	0.50 (01)	-	1.375 (05)	4.750 (14)	5.250 (13)	10.00 (27)
8.	RR&RS, SKUAST-K, Khudwani, Anantnag (J&K)	16	16	16	16	-	-	-	16.00 (26)	-	-	-	-	16.00 (26)	-	16.00 (26)
9.	RARS, SKUAST-Jammu, Tandwal, Rajouri (J&K)	12	12	10	10	1.00 (01)	1.00 (01)	-	5.00 (05)	-	-	-	3.00 (03)	7.00 (07)	3.00 (03)	10.00 (10)
10.	KVK (CSKHPKV), Bara, Hamirpur (HP)	15	15	15	15	1.20 (03)	-	2.00 (04)	7.40 (13)	-	-	1.40 (02)	3.00 (06)	10.60 (20)	4.40 (08)	15.00 (28)
11.	AICW&BIP Sub-Centre, CAU, Imphal (Manipur)	10	10	10	10	-	2.00 (02)	1.00 (01)	5.00 (05)	-	-	-	2.00 (02)	8.00 (08)	2.00 (02)	10.00 (10)
	NEPZ															
12.	NDUA&T, Kumarganj, Ayodhya (UP)	18	18	18	18	-	-	5.00 (05)	10.00 (10)	1.00 (01)	-	-	2.00 (02)	15.00 (15)	3.00 (03)	18.00 (18)
13.	CSAUA&T, Kanpur	20	20	20	20	1.00	-	16.00	1.00	-	-	2.00	-	18.00	2.00	20.0

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
	(UP)					(01)		(15)	(01)			(02)		(17)	(02)	(19)
14.	BHU, Varanasi (UP)	20	20	20	20	-	1.50 (02)	6.50 (06)	12.00 (09)	-	-	-	-	20.00 (17)	-	20.00 (17)
15.	KVK, Sohna, Sidharthnagar (UP)	25	25	24	24	1.00 (01)	-	19.00 (20)	4.00 (04)	-	-	-	-	24.00 (25)	-	24.00 (25)
16.	Kamla Nehru KVK, Sultanpur (UP)	12	12	12	12	1.00 (01)	-	-	10.00 (10)	-	-	-	1.00 (01)	11.00 (11)	1.00 (01)	12.00 (12)
17.	KVK (NDUA&T), Katiya, Banjariaya Farm, Basti (UP)	10	10	9	9	1.40 (06)	-	2.60 (09)	4.00 (12)	-	-	0.60 (02)	0.40 (01)	8.00 (27)	1.00 (03)	9.00 (30)
18.	BCKV, Kalyani, Nadia (West Bengal)	25	25	25	25	6.8 (12)	-	8.80 (13)	6.90 (10)	1.30 (03)	0.70 (01)	-	0.50 (01)	22.50 (35)	2.50 (05)	25.00 (40)
19.	UBKV, Pundibari, Coochbehar (West Bengal)	25	25	25	27.75	17.50 (09)	-	9.25 (06)	1.00 (0)	-	-	-	-	27.75 (16)	-	27.75 (16)
20.	RARS, AAU, Shillongani, Nagaon (Assam)	25	25	25	25	-	2.00 (02)	3.00 (03)	19.00 (19)	-	1.00 (01)	-	-	24.00 (24)	1.00 (01)	25.00 (25)
21.	KVK (AAU), Chirakuta, (Jamduar Pt.II) Dhubri (Assam)	24	24	24	25.77*	14.13 (35)	-	7.65 (10)	3.99 (06)	-	-	-	-	25.77 (51)	-	25.77 (51)
22.	KVK (AAU), Napam, Tejpur, Sonitpur (Assam)	18	18	18	18	-	-	11.00 (11)	6.00 (06)	-	-	1.00 (01)-	-	17.00 (17)	1.00 (01)	18.0 (18)
23.	KVK (AAU), Kajalgaon, Chirang (Assam)	24	24	24	24.5*	-	1.25 (03)	12.5 (30)	10.75 (16)	-	-	-	-	24.5 (49)	-	24.5 (49)
24.	IARI, RS, Pusa, Samastipur (Bihar)	25	25	25	25	-	-	23.00 (23)	-	-	-	1.00 (01)	1.00 (01)	23.00 (23)	2.00 (02)	25.00 (25)
25.	KVK (Gram Nirman Mandal), Sokhodeora, Nawadah (Bihar)	15	15	15	15	1.00 (01)	1.00 (01)	-	11.00 (11)	-	-	-	2.00 (02)	13.00 (13)	2.00 (033)	15.00 (15)
26.	KVK (RAU), Hariharpur, Vaishali (Bihar)	24	24	24	24	3.00 (03)	-	11.00 (06)	10.00 (06)	-	-	-	-	24.00 (15)	-	24.00 (15)

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
27.	KVK (Vanvasi Seva Kendra), Adhaura, Kaimur, Bhabua (Bihar)	18	18	18	18	-	-	16.00 (15)	2.00 (02)	-	-	-	-	18.00 (17)	-	18.00 (17)
28.	KVK (SKCET), Chanpura-Basaith, Madhubani (Bihar)	12	12	12	12	-	-	-	12.00 (12)	-	-	-	-	12.00 (12)	-	12.00 (12)
29.	KVK (RAU), Pipra Kothi, East Champaran (Bihar)	18	18	18	18	-	-	10.00 (09)	5.00 (05)	-	-	3.00 (03)	-	15.00 (14)	3.00 (03)	18.00 (17)
30.	KVK (RAU), Madhopur, West Champaran (Bihar)	18	18	18	18	-	-	12.00 (12)	6.00 (06)	-	-	-	-	18.00 (18)	-	18.00 (18)
31.	KVK (Samta Seva Kendra-Sitamarhi), Balha Madhusudan, Pupri, Sitamarhi (Bihar)	12	12	12	12	-	-	8.00 (08)	4.00 (04)	-	-	-	-	12.00 (12)	-	12.00 (12)
32.	BAU, Kanke, Ranchi (Jharkhand)	20	20	20	20	-	-	10.5 (09)	6.00 (03)	-	-	1.50 (01)	2.00 (02)	16.50 (12)	3.50 (03)	20.00 (15)
33.	KVK (Ramakrishna Mission), Morabadi, Ranchi (Jharkhand)	25	25	25	25	-	6.00 (06)	13.00 (13)	-	-	4.00 (04)	2.00 (02)	-	19.00 (19)	6.00 (06)	25.00 (25)
34.	KVK (BAU), Jagannathpur, West Singhbhum (Jharkhand)	20	20	20	20	-	20.00 (20)	-	-	-	-	-	-	20.00 (20)	-	20.00 (20)
	NWPZ															
35.	KVK (CSKHPKV), Una (HP)	12	12	12	12	-	-	-	11.00 (10)	-	-	-	1.00 (01)	11.00 (10)	1.00 (01)	12.00 (11)
36.	KVK (SKUAST-Jammu), Rajhani, Kathua, Jammu (J&K)	25	25	25	25	1.00 (01)	1.00 (01)	-	22.00 (23)	-	-	-	1.00 (01)	24.00 (25)	1.00 (01)	25.00 (26)
37.	PAU, Ludhiana (Punjab)	25	25	25	25	2.00 (02)	-	-	18.00 (18)	-	-	-	5.00 (05)	20.00 (20)	5.00 (05)	25.00 (25)

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
38.	PAU, RRS, Gurdaspur (Punjab)	18	18	18	18	-	-	-	18.00 (18)	-	-	-	-	18.00 (18)	-	18.00 (18)
39.	KVK (PAU), Haveli Kalan, Rupnagar (Punjab)	15	15	15	15	-	-	1.00 (01)	14.00 (12)	-	-	-	-	15.00 (13)	-	15.00 (13)
40.	KVK (PAU), Usman, Jahangir, Amritsar (Punjab)	15	15	15	15	3.00 (02)	-	-	12.00 (09)	-	-	-	-	15.00 (11)	-	15.00 (11)
41.	RBS College, Bichpuri, Agra (UP)	15	15	15	15	1.00 (01)	-	10.00 (10)	2.00 (02)	-	-	1.00 (01)	1.00 (01)	13.00 (13)	2.00 (02)	15.00 (15)
42.	KVK, Baghara, Muzaffarnagar (UP)	15	15	15	15	1.00 (01)	-	7.00 (07)	6.00 (06)	-	-	-	1.00 (01)	14.00 (14)	1.00 (01)	15.00 (15)
43.	ZARS, Nagina, Bijnor (UP)	12	12	12	12	1.00 (01)	-	9.00 (09)	2.00 (02)	-	-	-	-	12.00 (12)	-	12.00 (12)
44.	KVK, Khajuri Bagh, New Gopal Nagar, Saharanpur (UP)	12	12	12	12	-	-	9.00 (09)	3.00 (03)	-	-	-	-	12.00 (12)	-	12.00 (12)
45.	ICAR-IIFSR, Modipuram, Meerut (UP)	10	10	10	10	7.50 (15)	-	2.50 (05)	-	-	-	-	-	10.00 (20)	-	10.00 (20)
46.	KVK, Shamli (UP)	8	8	8	8	-	-	7.00 (07)	1.00 (01)	-	-	-	-	8.00 (08)	-	8.00 (08)
47.	Amity Centre for Extension Services, Sector-125, Noida (UP)	15	15	15	15	2.00 (02)	-	13.00 (13)	-	-	-	-	-	15.00 (15)	-	15.00 (15)
48.	GBPUA&T, Pantnagar, US Nagar (Uttarakhand)	12	12	12	12	-	-	3.00 (03)	2.00 (02)	-	-	4.00 (04)	3.00 (03)	5.00 (05)	7.00 (07)	12.00 (12)
49.	KVK, Haridwar	6	6	6	6	-	-	-	6.00 (06)	-	-	-	-	6.00 (06)	-	6.00 (06)
50.	CATAT, ICAR-IARI, New Delhi	18	18	18	18	4.00 (04)	-	2.00 (02)	9.00 (09)	-	-	2.00 (02)	1.00 (01)	15.00 (15)	3.00 (03)	18.00 (18)
51.	KVK (NHRDF), Ujwa, New Delhi	18	18	18	18	1.00 (01)	-	14.00 (14)	2.00 (02)	-	-	1.00 (01)	-	17.00 (17)	1.00 (01)	18.00 (18)
52.	ICAR-IIWBR, Karnal	20	20	20	20	2.00	-	1.00	16.00	-	-	-	1.00	19.00	1.00	20.00

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
	(Haryana)					(02)		(01)	(16)				(01)	(19)	(01)	(20)
53.	ICAR-CSSRI, Karnal (Haryana)	18	18	18	20*	-	-	-	19.00 (19)	-	-	-	1.00 (01)	19.00 (19)	1.00 (01)	20.00 (20)
54.	CCSHAU, Hisar (Haryana)	15	15	15	15	2.00 (02)	-	-	13.00 (13)	-	-	-	-	15.00 (15)	-	15.00 (15)
55.	KVK (CCSHAU), Bhiwani (Haryana)	12	12	12	12	1.00 (01)	-	2.00 (02)	7.00 (07)	-	-	-	2.00 (02)	10.00 (10)	2.00 (02)	12.00 (12)
56.	KVK (SCHE), Tepla, Ambala (Haryana)	12	12	12	12	-	-	-	10.00 (08)	-	-	-	2.00 (01)	10.00 (08)	2.00 (01)	12.00 (09)
57.	KVK (CCSHAU), Peoda Road, Kaithal (Haryana)	12	12	12	12	1.00 (01)	-	1.00 (01)	9.00 (09)	-	-	-	1.00 (01)	11.00 (11)	1.00 (01)	12.00 (12)
58.	RARI (SKNAU-Jobner), Durgapura, Jaipur (Rajasthan)	14	14	14	14	-	2.00 (02)	7.00 (07)	2.00 (02)	-	-	3.00 (03)	-	11.00 (11)	3.00 (03)	14.00 (14)
59.	KVK (SKNAU-Jobner), Ajmer (Rajasthan)	12	12	12	12	-	-	10.00 (10)	-	-	-	2.00 (02)	-	10.00 (10)	2.00 (02)	12.00 (12)
60.	KVK (Banasthali Vidyapeeth), Tonk (Rajasthan)	12	12	12	12	1.00 (01)	5.00 (05)	4.00 (04)	1.00 (01)	-	-	-	1.00 (01)	11.00 (11)	1.00 (01)	12.00 (12)
61.	ARS (SKRAU-Bikaner), Karni Road, Sriganganagar (Rajasthan)	12	12	12	12	5.00 (07)	-	7.00 (09)	-	-	-	-	-	12.00 (16)	-	12.00 (16)
62.	KVK, Bharatpur (Rajasthan)	6	6	6	6	2.00 (02)	-	1.00 (01)	2.00 (02)	-	-	1.00 (01)	-	5.00 (05)	1.00 (01)	6.00 (06)
63.	KVK, Pokaran, Jaisalmer (Raj.)	6	6	NC	-	-	-	-	-	-	-	-	-	-	-	-
	CZ															
64.	RCOA (MPUA&T), Udaipur (Rajasthan)	18	18	18	18	-	17.00 (17)	1.00 (01)	-	-	-	-	-	18.00 (18)	-	18.00 (18)
65.	ARS (MPUA&T), Banswara (Raj.)	16	16	16	16	3.00 (03)	9.00 (09)	-	-	-	4.00 (04)	-	-	12.00 (12)	4.00 (04)	16.00 (16)
66.	ARS, MPUA&T, Kota, (Rajasthan)	18	18	18	18	3.00 (03)	6.00 (06)	8.00 (08)	1.00 (01)	-	-	-	-	18.00 (18)	-	18.00 (18)

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
67.	WRS (JAU), Junagarh (Gujarat)	25	25	25	25	-	-	1.00 (01)	21.00 (21)	-	-	-	3.00 (03)	22.00 (22)	3.00 (03)	25.00 (25)
68.	CERW (SDAU), Vijapur, Mehsana (Gujarat)	25	25	25	25	1.00 (01)	-	3.00 (03)	21.00 (21)	-	-	-	-	25.00 (25)	-	25.00 (25)
69.	JNKVV, Jabalpur (MP)	25	25	25	25	-	-	15.50 (14)	6.50 (03)	-	-	2.00 (02)	1.00 (01)	22.00 (17)	3.00 (03)	25.00 (20)
70.	ICAR-IARI, RWRS, Indore (MP)	25	25	25	25.5*	-	-	18.00 (14)	7.50 (04)	-	-	-	-	25.50 (18)	-	25.50 (18)
71.	KVK (JNKVV), Purushottampur, Panna (MP)	18	18	18	18	-	-	12.00 (12)	4.00 (04)	-	-	2.00 (02)	-	16.00 (16)	2.00 (02)	18.00 (18)
72.	KVK, Tikamgarh, (MP)	25	25	25	25	1.00 (01)	-	11.00 (11)	6.00 (06)	4.00 (04)	-	-	3.00 (03)	18.00 (18)	7.00 (06)	25.00 (24)
73.	KVK (RVSKVV), Pipersama, Neemuch (MP)	12	12	12	12	-	-	12.00 (12)	-	-	-	-	-	12.00 (12)	-	12.00 (12)
74.	KVK (RVSKVV), COH, Mandsour (MP)	12	12	12	12	4.00 (04)	1.00 (01)	7.00 (07)	-	-	-	-	-	12.00 (12)	-	12.00 (12)
75.	KVK (RVSKVV), M.L.Nagar, Ujjain (MP)	10	10	10	10	3.00 (03)	-	1.00 (01)	6.00 (06)	-	-	-	-	10.00 (10)	-	10.00 (10)
76.	KVK (JNKVV), Sudamanagar, Harda (MP)	10	10	10	10	-	-	-	10.00 (10)	-	-	-	-	10.00 (10)	-	10.00 (10)
77.	KVK (IGKV-Raipur), RRS, Kumhrawand Farm, Jagdalpur, Bastar (Chhattisgarh)	18	18	18	18	-	1.00 (01)	3.00 (03)	7.00 (07)	-	1.00 (01)	-	6.00 (06)	11.00 (11)	7.00 (07)	18.00 (18)
78.	BTC College of Agri & RS (IGKV-Raipur), Sarkanda, Bilaspur (Chhattisgarh)	25	25	25	25	25.00 (25)	-	-	-	-	-	-	-	25.00 (25)	-	25.00 (25)

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in Acres, (No. of Farmers)				Achievement Women, Area in Acres, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (Acres)	No. of FLDs	Area under FLDs (Acres)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(Acres) (No. of Farmers)	Area(ha) (No. of Farmers)	Area (Acres) (No. of Farmers)
	PZ															
79.	Dr. PDKV, Krishi Nagar, Akola (Maharashtra)	25	25	25	25	3.0 (03)	1.00 (01)	20.00 (20)	1.00 (01)	-	-	-	-	25.00 (25)	-	25.00 (25)
80.	ARS, Niphad, Nasik (Maharashtra)	25	25	25	25	-	11.00 (11)	5.00 (05)	7.00 (07)	-	-	-	2.00 (02)	23.00 (23)	2.00 (02)	25.00 (25)
81.	MAU, Parbhani (Maharashtra)	25	25	25	26*	1.00 (01)	-	1.00 (01)	24.00 (23)	-	-	-	-	26.00 (25)	-	26.00 (25)
82.	ARI, MACS, Agharkar Road, Pune (Maharashtra)	25	25	25	25	1.00 (01)	-	4.00 (04)	16.00 (16)	1.00 (01)	-	-	3.00 (03)	21.00 (21)	4.00 (04)	25.00 (25)
83.	UAS, Dharwad (Karnataka)	50	50	50	50	5.00 (05)	3.00 (03)	-	35.00 (35)	1.00 (01)	-	-	6.00 (06)	43.00 (43)	7.00 (07)	50.00 (50)
84.	BIRDS KVK, Tukkanatti, Gokak, Belgaum (Karnataka)	25	25	25	25	1.00 (01)	2.00 (02)	3.00 (03)	15.00 (15)	1.0 (01)	-	-	3.00 (03)	21.00 (21)	4.00 (04)	25.00 (25)
85.	ICAR-IARI, RS, Wellington (Tamil Nadu)	50	50	50	53	8.00 (04)	-	40.50 (20)	4.50 (02)	-	-	-	-	53.00 (26)	-	53.00 (26)
	Total =	1500	1500	1468	1479.52	160.83 (206)	95.88 (100)	488.78 (490)	602.79 (642)	15.78 (33)	12.70 (13)	30.50 (32)	72.28 (91)	1348.27 (1439)	131.25 (168)	1479.52 (1607)

Annexure - II : Category wise number of barley FLDs farmers during 2019-20

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in ha, (No. of Farmers)				Achievement Women, Area in ha, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (ha)	No. of FLDs	Area under FLDs (ha)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(ha) (No. of Farmers)	Area(ha) (No. of Farmers)	Area(ha) (No. of Farmers)
	NHZ															
1.	CSKHPKV, HAREC, Bajaura, Kullu (HP)	12	12	5	5	5.0 (7)	-	-	-	-	-	-	-	5.0 (07)	-	5.0 (07)
2.	ICAR-IARI, RS, Amartara Cottage, Shimla (HP)	12	12	12	12	-	-	-	12.0 (17)	-	-	-	-	12.0 (17)	-	10.0 (17)
	NEPZ															
3.	NDUA&T, Narendranagar, Kumarganj, Ayodhya (UP)	12	12	12	12	-	-	-	12.0 (12)	-	-	-	-	12.0 (12)	-	12.0 (12)
4.	KVK (IAS-BHU), Barkachha, Mirzapur (UP)	12	12	12	12	-	-	6.0 (6)	6.0 (6)	-	-	-	-	12.0 (12)	-	12.0 (12)
5.	CSAUA&T, Kanpur (UP)	12	12	12	12	2.0 (2)	-	8.0 (8)	-	1.0 (1)	-	1.0 (1)	-	10.0 (10)	2.0 (2)	12.0 (12)
6.	BHU, Varanasi (UP)	12	12	-	-	-	-	-	-	-	-	-	-	-	-	-
	NWPZ															
7.	PAU, Ludhiana (Punjab)	08	08	08	08	-	-	-	8.0 (8)	-	-	-	-	8.0 (08)	-	8.0 (08)
8.	KVK, Mansa (Punjab)	12	12	12	12	-	-	-	12.0 (14)	-	-	-	-	12.0 (14)	-	12.0 (14)
9.	CCSHAU, Hisar (Haryana)	12	12	12	12	-	-	5.0 (5)	7.0 (7)	-	-	-	-	12.0 (12)	-	12.0 (12)
10.	KVK, Rampura, Rewari (Haryana)	12	12	12	12	-	-	12.0 (12)	-	-	-	-	-	12.0 (12)	-	12.0 (12)
11.	KVK (CCSHAU), Bhiwani (Haryana)	12	12	12	12	1.0 (1)	-	2.0 (2)	9.0 (13)	-	-	-	-	12.0 (16)	-	12.0 (16)
12.	RARI (SKNAU), Durgapura, Jaipur (Rajasthan)	16	16	16	16	2.0 (2)	3.0 (3)	7.0 (7)	2.0 (2)	-	-	2.0 (2)	-	14.0 (14)	2.0 (02)	16.0 (16)

S.N.	Name of Centre	Allocation		Achievement		Achievement Men, Area in ha, (No. of Farmers)				Achievement Women, Area in ha, (No. of Farmers)				Men	Women	Total
		No. of FLDs	Area under FLDs (ha)	No. of FLDs	Area under FLDs (ha)	SC	ST	OBC	Gen	SC	ST	OBC	Gen	Area(ha) (No. of Farmers)	Area(ha) (No. of Farmers)	Area(ha) (No. of Farmers)
13.	KVK, Tankarda, Chomu, Jaipur (Rajasthan)	10	10	10	12*	-	-	9.0 (6)	1.5 (1)	-	-	1.5 (1)	-	10.5 (7)	1.5 (1)	12.0 (8)
14.	KVK (AU-Kota) Akorashi, Dhindora, Hindauncity, Karauli (Rajasthan)	12	12	12	12	-	0.75 (1)	7.75 (13)	0.75 (1)	-	-	0.75 (1)	-	11.25 (15)	0.75 (1)	12.0 (16)
	CZ															
15.	RCOA, MPUA&T, Udaipur (Rajasthan)	12	12	12	12	-	8.0 (8)	4.0 (4)	-	-	-	-	-	12.0 (12)	-	12.0 (12)
16.	KVK (MPUA&T), Dhoinda, Rajasmand (Rajasthan)	12	12	12	12	-	-	12.0 (12)	-	-	-	-	-	12.0 (12)	-	12.0 (12)
17.	KVK (JNKVV), Kuthulia Farm, Rewa (MP)	12	12	12	12	-	-	1.6 (2)	9.6 (12)	-	-	-	0.8 (1)	11.2 (14)	0.8 (1)	12.0 (15)
18.	KVK (JNKVV), Purushottampur, Panna (MP)	12	12	12	16*	-	-	9.0 (9)	3.0 (2)	2.0 (2)	-	-	2.0 (1)	12.0 (11)	4.0 (3)	16.0 (14)
19.	KVK (JNKVV), Nowgaon, Chhattarpur (MP)	12	12	12	12	1.0 (1)	-	6.0 (6)	4.0 (4)	-	-	1.0 (1)	-	11.0 (11)	1.0 (01)	12.0 (12)
20.	KVK (RVSKVV), Biaora, Kothi Bagh, Rajgarh (MP)	12	12	12	12	1.0 (1)	-	1.0 (1)	10.0 (10)	-	-	-	-	12.0 (12)	-	12.0 (12)
21.	KVK (RVSKVV), Ganj Basoda, Vidisha (MP)	12	12	12	12	1.0 (1)	-	2.0 (2)	6.0 (6)	1.0 (1)	-	-	2.0 (2)	9.0 (09)	3.0 (03)	12.0 (12)
	Total	250	250	231	237	13.00 (15)	11.75 (12)	92.35 (100)	102.85 (110)	4.0 (04)	-	6.50 (06)	4.80 (04)	221.95 (237)	15.05 (14)	237.00 (251)

Note : The figures in brackets indicate the number of farmers. * Area covered more than allotted which is restricted equal to allotted FLDs.

Annexure-III : Information on wheat varieties demonstrated in Frontline Demonstrations (FLDs) during 2019-20

Name of Variety	VL 967
Zone/State	Uttarakhand Hills (Organic cultivation)
Production condition	Timely sown, Rainfed
Year of release	2019
Released by CVRC/SVRC	SVRC
Developed by	VPKAS, Almora
Plant height (cm)	
Days to maturity (days)	160-170 days
1000-grain weight (g)	
Average yield (q/ha)	19.86
Potential yield (q/ha)	35.44
Special Feature: Organic cultivation	
Name of Variety	HS 542 (Pusa Kiran)
Zone/State	NHZ
Production condition	Rainfed, Early sown
Year of release	2015
Released by CVRC/SVRC	
Developed by	IARI, RS, Shimla
Plant height (cm)	
Days to maturity (days)	
1000-grain weight (g)	
Average yield (q/ha)	32.90
Potential yield (q/ha)	49.30
Special Feature: Resistance to yellow rust, brown rust and good for chapati quality.	
Name of Variety	HD 3086
Zone/State	NWPZ
Production condition	Timely sown, Irrigated
Year of release	2014
Released by CVRC/SVRC	CVRC
Developed by	IARI, New Delhi
Plant height (cm)	98
Days to maturity (days)	143
1000-grain weight (g)	39
Average yield (q/ha)	54.6
Potential yield (q/ha)	71.1
Special Feature: The variety has higher yield, resistant to yellow and brown rust.	

Name of Wheat Variety	PBW 677
Zone/State	State
Production condition	Timely sown irrigated conditions
Year of release	2016
Released by CVRC/SVRC	SVRC
Developed by	PAU, Ludhiana
Plant height (cm)	107 cm
Days to maturity (days)	157 days
1000-grain weight (g)	41 g
Average yield (q/ha)	60.8
Potential yield (q/ha)	78.2
Special Feature: Green foliage with semi-erect growth habit, Parallel ear shape with medium ear density.PBW 677 takes about 106 days (range 98-114 days) from seeding to heading and 157 days (150-167 days) for maturity seed to seed.PBW 677 possesses resistance to yellow and brown rusts both under natural and artificial conditions.	
Name of Wheat Variety	PBW 725
Zone/State	State
Production condition	Timely sown irrigated conditions
Year of release	2016

Released by CVRC/SVRC	SVRC
Developed by	PAU, Ludhiana
Plant height (cm)	105 cm
Days to maturity (days)	154 days
1000-grain weight (g)	43g
Average yield (q/ha)	61.7
Potential yield (q/ha)	81.5
Significantly out yielded the check varieties DPW 621-50, HD 2967 and WH 1105 by 7.7, 7.6 & 1.9 percent, respectively in research and adaptive trials conducted in the Punjab state.High degree of resistance to yellow rust & brown rust. Glume shoulder shape sloping with short glume beak length and straight peduncle attitude, Parallel ear shape and medium ear density.	
Name of Wheat Variety	PBW1Zn (HPBW 01)
Zone/State	NWPZ
Production condition	Timely sown irrigated conditions
Year of release	2017
Released by CVRC/SVRC	CVRC
Developed by	PAU, Ludhiana
Plant height (cm)	103
Days to maturity (days)	151
1000-grain weight (g)	47
Average yield (q/ha)	59.3
Potential yield (q/ha)	70.8
Special Feature: Dark green foliage; semi-erect growth habit, ear bearing tapering shape with intermediate density.Based on three years of testing in coordinated trials in NWPZ, PBW 1 Zn possessed higher (14.7%) grain zinc concentration (40.6 ppm) compared to the check PBW 621 (35.4 ppm) along with higher grain iron (5.0%) concentration, with other quality parameters almost comparable to check varieties.PBW 1 Zn possessed low ACI (average coefficient of infection) for yellow rust under natural and artificial conditions over the years in comparison with the check. PBW 1 Zn possessed very high level of resistance to brown rust under natural and artificial conditions over the years.	

Name of Variety	KRL 210
Zone/State	Northern Plains Zone
Production condition	Timely sown, Irrigated, saline soils
Year of release	2012
Released by CVRC/SVRC	CVRC
Developed by	CSSRI, KARNAL
Plant height (cm)	99
Days to maturity (days)	143
1000-grain weight (g)	40.1
Average yield (q/ha)	33.7
Potential yield (q/ha)	49.3
Special Feature: KRL 210 has shown high yielding ability along with salt tolerance over years and locations. This variety is lodging resistance, possessing resistance to yellow and brown rust along with good quality parameters.	
Name of Variety	HI 8737(d)
Zone/State	CZ
Production condition	Timely sown, Irrigated
Year of release	2014
Released by CVRC/SVRC	CVRC
Developed by	IARI, Indore
Plant height (cm)	85
Days to maturity (days)	124
1000-grain weight (g)	51
Average yield (q/ha)	53.4
Potential yield (q/ha)	81.0
Special Feature: HI 8737 is a widely adopted high yielding durum genotype that has shown yield stability under timely and late sown conditions. The variety has good levels of resistance against leaf and stem rust seedling resistance test indicated presence of diverse genes for resistance. The variety is good for chapatti making and also for pasta preparations and essential micro-nutrients like iron and zinc.	

Name of Variety	DBW 110
Zone/State	CZ
Production condition	Timely sown, Restricted Irrigation
Year of release	2015
Released by CVRC/SVRC	CVRC
Developed by	IIWBR, Karnal
Plant height (cm)	89
Days to maturity (days)	124
1000-grain weight (g)	43
Average yield (q/ha)	39.2
Potential yield (q/ha)	50.1
Special Feature: DBW 110 has high yield potential under timely sown restricted irrigation condition in central zone. This genotype is resistance to brown and black rust. It is also resistance to Karnal bunt. This genotype has shown promise for better yield with two irrigations. It has good protein, test weight and good chapatti/bread making score.	
Name of Variety	HI 8759 (d)
Zone/State	Central Zone
Production condition	Timely sown, Irrigated conditions
Year of release	2016
Released by CVRC/SVRC	CVRC
Developed by	ICAR-IARI Regional Station, Indore (MP)
Plant height (cm)	80-85
Days to maturity (days)	115-120
1000-grain weight (g)	50-55
Average yield (q/ha)	56.9
Potential yield (q/ha)	75.5
Special Feature: It can serve as a "dual purpose" variety suitable both for making chapati and for pasta preparations due to its moderate SDS-sedimentation value (~35 ml) and high protein content (~12.0 %), good levels of yellow pigment (~5.7 ppm), and essential micronutrients like iron (42.1 ppm) and zinc (42.8 ppm).	
Name of Variety	Raj 4238
Zone/State	CZ
Production condition	Late sown, Irrigated
Year of release	2016
Released by CVRC/SVRC	CVRC
Developed by	RS, RAU, Durgapura
Plant height (cm)	84
Days to maturity (days)	114
1000-grain weight (g)	40
Average yield (q/ha)	45.5
Potential yield (q/ha)	62.8
Special Feature: Good for chapatti (score 8.0)	
Name of Variety	GW 451
Zone/State	Gujarat
Production condition	Timely sown, Irrigated
Year of release	2016
Released by CVRC/SVRC	SVRC
Developed by	Vijapur
Plant height (cm)	76 (68-88)
Days to maturity (days)	105 (95-113)
1000-grain weight (g)	45.8 (37-48)
Average yield (q/ha)	53.9
Potential yield (q/ha)	66.0
Name of Variety	MP 3382
Zone/State	MP
Production condition	Irrigated timely sown (High fertility timely sown)
Year of release	2015-16
Released by CVRC/SVRC	SVRC

Developed by	JNKVV, Jabalpur (MP)
Plant height (cm)	85-90
Days to maturity (days)	115-120
1000-grain weight (g)	44-46
Average yield (q/ha)	52-55
Potential yield (q/ha)	60-65
Special Feature: Semi erect flag leaves, thick stem, waxiness is present on peduncle, leaf sheath and ear, early maturing, dwarf, non-lodging with rich in protein and other quality attributes, resistance to the black and leaf rusts, high protein, good grain appearance and hectoliters weight with high Glu-1 score, better chapatti making quality, bread loaf volume, wet dry gluten content, gluten index and zinc.	
Name of Variety	NIAW 1994 (Phule Samadhan)
Zone/State	Maharashtra state
Production condition	Late sown irrigated and Timely sown irrigated
Year of release	2014
Released by CVRC/SVRC	SVRC
Developed by	ARS, Niphad, MPKV, Rahuri, Ahmednagar, (Maharashtra)
Plant height (cm)	Timely sown irrigated: 73-87 cm Late sown irrigated : 67-84 cm
Days to maturity (days)	Timely sown irrigated: 108(95-118) days Late sown irrigated: 97 (91-102) days
1000-grain weight (g)	Timely sown irrigated: Large 43g (42-44g) Late sown irrigated: Medium 39g (36g-42g)
Average yield (q/ha)	Timely sown irrigated: 46.12 q/ha Late sown irrigated: 44.23 q/ha
Special Feature: NIAW 1994 is a thermo-tolerant variety which suits both the sowing conditions viz., Late sown irrigated and Timely sown irrigated. <i>chapatti</i> quality of NIAW 1994 is superior than the checks viz. MACS 6222, NIAW 34 and NIAW 917 . Grain protein content in NIAW 1994 varies between 12.5 to 13.8 % under different conditions. Under late sown condition NIAW 1994 is superior in hectoliter weight (81.1) against HD 2392 (80.0), similarly under timely sown condition NIAW 1994 (81.5) showed higher test weight than MACS 6222 (81.1).	
Name of Variety	MACS 6478
Zone/State	PZ
Production condition	Timely sown, Irrigated
Year of release	2014
Released by CVRC/SVRC	CVRC
Developed by	ARI, Pune
Plant height (cm)	78
Days to maturity (days)	105
1000-grain weight (g)	45.1
Average yield (q/ha)	45
Potential yield (q/ha)	65.7
Special Feature: Variety MACS 6478 is highly resistant to both black and brown rust and carries adult plant resistant genes. This variety has high yield potential and thus can give better yield with matching agronomic practices. The variety has high protein content and better nutritional quality for zinc and iron thereby making it good for chapatti and bread quality.	
Name of Variety	MACS 3949 (d)
Zone/State	Peninsular Zone
Production condition	Irrigated timely sown condition
Year of release	2017
Released by CVRC/SVRC	CVRC
Developed by	Agharkar Research Institute (MACS), Pune
Plant height (cm)	81 cm (78 to 83 cm)
Days to maturity (days)	112 days (108 to 117)
1000-grain weight (g)	47 g

Average yield (q/ha)	43.9 q/ha
Potential yield (q/ha)	53.5 q/ha
Special Feature: MACS 3949 (d) has bold & lustrous grain with 47g 1000-grain weight with high protein content (12.9 %), better nutritional quality (Zinc 40.6 ppm, Iron 38.6 ppm) with good milling quality (Test weight 81.4 kg/hl) and highest overall acceptability 7.25 (best cooking quality for pasta product out of 9). It has also shown resistance against stem and leaf rusts under both natural and artificial screening conditions. MACS 3949 (d) also showed resistance against leaf blight, powdery mildew, flag smut and Karnal bunts. It has also shown good level of resistance to insect pests than checks.	
Name of Variety	UAS 446 (d)
Zone/State	PZ
Production condition	Timely sown, Rainfed
Year of release	2015
Released by CVRC/SVRC	CVRC
Developed by	UAS Dharwad
Plant height (cm)	66
Days to maturity (days)	96
1000-grain weight (g)	44
Average yield (q/ha)	18.3
Potential yield (q/ha)	24.4
Special Feature: UAS 446 is a high yielding durum wheat genotype suitable for rainfed condition and responded well to different doses of fertilizers. It is resistant to black and brown rusts.	
Name of Variety	UAS 347
Zone/State	PZ
Production condition	Timely sown, Rainfed
Year of release	2015
Released by CVRC/SVRC	CVRC
Developed by	UAS, Dharwad
Average yield (q/ha)	18.4
Potential yield (q/ha)	24.6
Special Feature: Good for biscuit quality (score 8.47)	
Name of Variety	HI 1605
Zone/State	Peninsular Zone
Production condition	Timely sown, Restricted Irrigation Conditions
Year of release	2016
Released by CVRC/SVRC	CVRC
Developed by	ICAR-IARI Regional Station, Indore (MP)
Plant height (cm)	80-85
Days to maturity (days)	105-110
1000-grain weight (g)	35 - 40
Average yield (q/ha)	29.1
Potential yield (q/ha)	44.0
Special Feature: HI 1605 is a good quality wheat genotype with high protein content (~13%), good grain appearance (~6.5), high sedimentation value (~55 ml), high extraction rate (~74%), good bread, chapatti and biscuit quality with good levels of micronutrients like iron (43.0 ppm) and zinc (35.0 ppm).	
Name of Variety	HW 5207 as COW3
Zone/State	Tamil Nadu including hilly regions
Production condition	Restricted irrigated, medium fertility, timely sown conditions in Tamil Nadu including hills
Year of release	2017 by CVRC
Released by CVRC/SVRC	2017 by CVRC and 2015 by SVRC
Developed by	IARI, Regional Station, Wellington, Tamil Nadu
Plant height (cm)	90 cms
Days to maturity (days)	95-100 Days
1000-grain weight (g)	40.5gm
Average yield (q/ha)	40.70q/ha
Potential yield (q/ha)	59.60q/ha

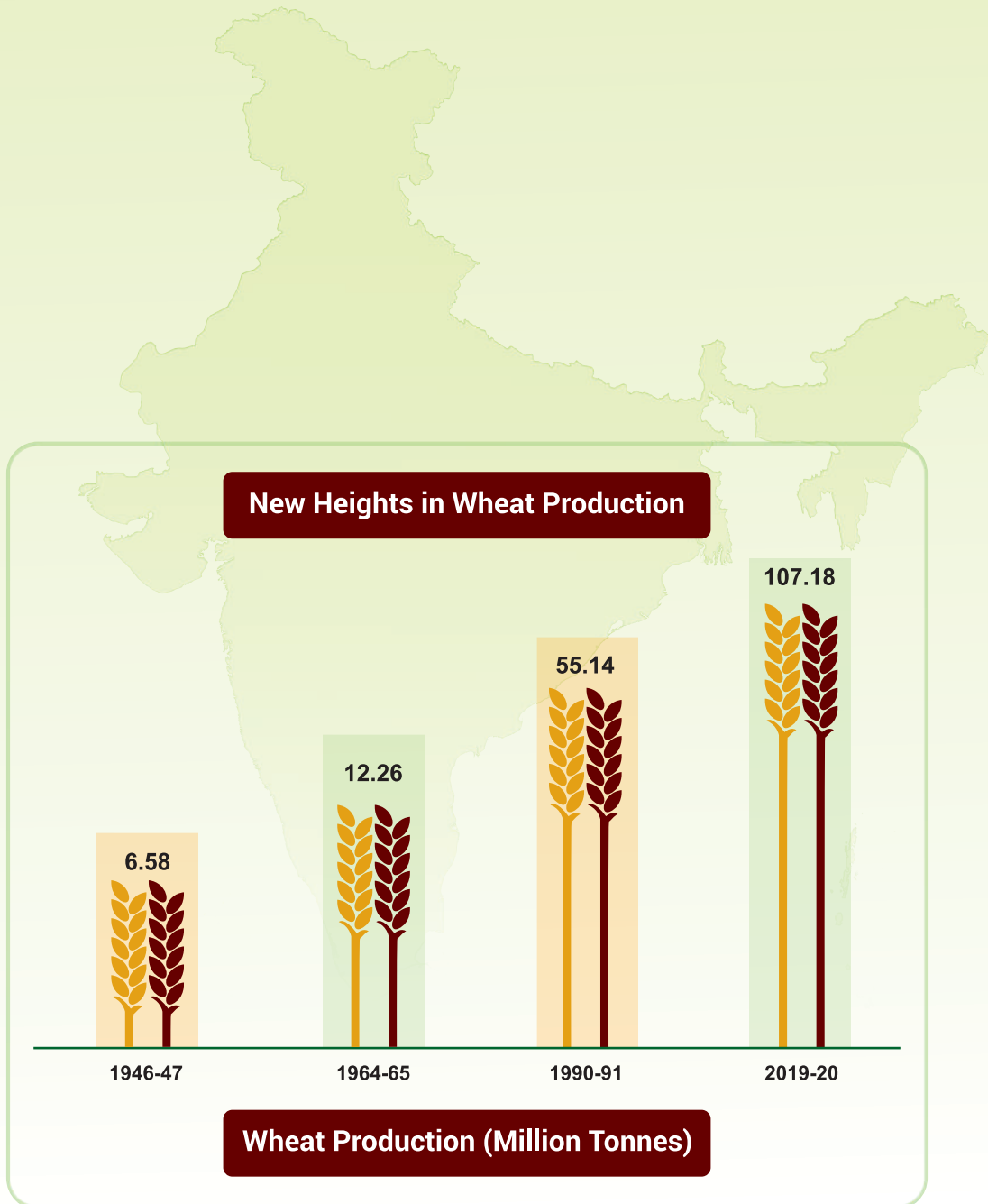
Special Feature: HW 5207(COW3) has recorded the highest mean grain yield (4076 kg/ha) which is 12 per cent increase over the check COW (W) 1 (3641 kg/ha) in a total of 131 trials. The variety mature in about 100 days still yielding over 40 q/ha and the per day productivity is much higher. It has the ideal plant height (90 cm) with erect plant type, strong and resilient stem providing resistance to lodging. It produces very nutritious grain, registering a mean test weight of 40.5g with more than 11 per cent protein, and high level of Iron (53.1ppm), Zinc (46.3ppm), Copper (5.33ppm) and Manganese (47.5ppm) indicating excellent grain nutritional quality. In addition, this variety has high scores for bread making quality (7.0 out of 10), *chapathi* quality (7.4 out of 10) with Glu-1 score of 8 out of 10 and mean sedimentation value of 45.5, high Hectolitre weight of 78.3. The variety HW 5207(COW3) showed high degree of resistance to stem, leaf and stripe rusts under both artificial and natural epiphytotic conditions against all the pathotypes occurring in the Nilgiris which is a hot spot for rust incidence.

Name of Variety	HW 1098 (Dicoccum)
Zone/State	SHZ
Production condition	Timely sown, Irrigated
Year of release	2015
Released by CVRC/SVRC	CVRC
Developed by	IARI-RS, Wellington
Plant height (cm)	85
Days to maturity (days)	106
1000-grain weight (g)	40.3
Average yield (q/ha)	45.5
Potential yield (q/ha)	59.0
Special Feature: Dicoccum variety HW1098 has high yield potential and showed wider adaptability for planting under normal and late sown conditions. This is a semi dwarf variety that has required level of resistance, medium bold grains, early maturing and good protein content.	
Name of Variety	PBW 723 (Unnat PBW 343)
Zone/State	NWPZ
Production condition	Timely sown, Irrigated
Year of release	2017
Released by CVRC/SVRC	CVRC
Developed by	PAU, Ludhiana, Punjab
Plant height (cm)	97
Days to maturity (days)	146
1000-grain weight (g)	42
Average yield (q/ha)	49.2
Potential yield (q/ha)	63.2
Special Feature: <i>T. aestivum</i> variety	
Name of Variety	DBW 173
Zone/State	NWPZ
Production condition	Late sown, Irrigated
Year of release	2017
Released by CVRC/SVRC	CVRC
Developed by	IIWBR, Karnal, Haryana
Plant height (cm)	90
Days to maturity (days)	122
1000-grain weight (g)	37
Average yield (q/ha)	47.2
Potential yield (q/ha)	57
Special Feature: <i>T. aestivum</i> variety	
Name of Variety	HI 1544 (Purna)
Zone/State	CZ
Production condition	Timely sown, Irrigated
Year of release	2007
Released by CVRC/SVRC	CVRC
Developed by	IARI, RS, Indore, MP
Plant height (cm)	85-90
Days to maturity (days)	111
1000-grain weight (g)	40-45
Average yield (q/ha)	51.4
Potential yield (q/ha)	68.2
Special Feature: <i>T. aestivum</i> variety	

Name of Variety	UAS 428 (d)
Zone/State	PZ
Production condition	Timely sown, Irrigated
Year of release	2012
Released by CVRC/SVRC	CVRC
Developed by	UAS, Dharwad
Plant height (cm)	83
Days to maturity (days)	108
1000-grain weight (g)	43.7
Average yield (q/ha)	48
Potential yield (q/ha)	58.8
Special Feature : <i>T. durum</i> variety	
Name of Variety	HI 8759 (d)
Zone/State	Central Zone
Production condition	Timely sown, Irrigated conditions
Year of release	2016
Released by CVRC/SVRC	CVRC
Developed by	ICAR-IARI Regional Station, Indore (MP)
Plant height (cm)	80-85
Days to maturity (days)	115-120
1000-grain weight (g)	50-55
Average yield (q/ha)	56.9
Potential yield (q/ha)	75.5
Special Feature: It can serve as a "dual purpose" variety suitable both for making chapati and for pasta preparations due to its moderate SDS-sedimentation value (~35 ml) and high protein content (~12.0 %), good levels of yellow pigment (~5.7 ppm), and essential micronutrients like iron (42.1 ppm) and zinc (42.8 ppm).	
Name of Variety	UAS 304
Zone/State	PZ
Production condition	Timely sown, Irrigated
Year of release	2013
Released by CVRC/SVRC	CVRC
Developed by	UAS, Dharwad
Plant height (cm)	80
Days to maturity (days)	109
1000-grain weight (g)	41.7
Average yield (q/ha)	46.8
Potential yield (q/ha)	59.9
Special Feature: UAS 304 is widely adopted genotype of bread wheat possessing multiple disease resistance to prevailing leaf and stem rust races and spot blotch. This variety good protein, bold grain and acceptable grain quality.	
Name of Variety	HD 4728 (d)
Zone/State	CZ
Production condition	Timely sown, Irrigated
Year of release	2016
Released by CVRC/SVRC	CVRC
Developed by	IARI, New Delhi
Plant height (cm)	89.3
Days to maturity (days)	120
1000-grain weight (g)	52.6
Average yield (q/ha)	54.2
Potential yield (q/ha)	75.1
Special Feature : <i>T. durum</i> variety	

Annexure-IV : Information on barley varieties demonstrated in Frontline Demonstrations (FLDs) during 2019-20

Variety	Zone	Production condition	Year	Developed by	Height (cm)	Days to maturity	TGW (gm)	Average Yield (q/ha)	Pot. Yield (q/ha)
HBL 713 (Him Palam Jau 1)	Low and Mid Hills of HP	Rainfed/Irrigated	2016	CSKHPKV, HAREC, Bajaura, Kullu (HP)	70-90	170-180	40.30	30-35	51.00
BHS 400	NHZ	Rainfed, Timely sown	2014	IARI, Regional Station, Shimla, HP	83	168	39.13	32.71	58.70
BHS 380	NHZ	Rainfed, Timely sown	2010	IARI, Regional Station, Shimla, HP	60	182	35.00	Grain=21.00 Forage=59.4	Grain=29.80 Forage=89.7
RD 2907	NWPZ NEPZ	Saline/Alkaline soils	2018	RARI, Durgapura, Jaipur, Rajasthan	88	124	43.3	35.25	53.60
RD 2899	CZ	Irrigated, Timely sown	2018	RARI, Durgapura, Jaipur, Rajasthan	84	115	46.67	42.19	57.43



59th All India Wheat & Barley Research Workers' Meet
(August 24-25, 2020)

59^{वीं} अखिल भारतीय गेहूँ एवं जौ अनुसंधान कार्यशाला
में आयोजित गोष्ठी के दौरान जारी किया गया