भाकृअनुप
ICAR

प्रगति प्रतिवेदन
Progress Report
2016-17

अखिल भारतीय समन्वित गेहूँ एवं जौ सुधार परियोजना

AICRP on Wheat and Barley Improvement

उत्पादन वृद्धि से किसान समृद्धि

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ICAR – Indian Institute of Wheat and Barley Research, Karnal

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AICRP on Wheat & Barley

PROGRESS REPORT
2016-17

WHEAT QUALITY

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(R.K. Gupta)
PI, Quality

CONTENTS

Detail of samples in Advance Varietal Trials

Station	Zone	Condition	No. of Samples	
			T. aestivum	*T. durum*
Ludhiana	NWPZ	ITS, ILS, RITS	58	-
Hisar	NWPZ	ITS, ILS, RITS	58	-
Delhi	NWPZ	ITS, ILS, RITS	58	-
Pantnagar	NWPZ	ITS, ILS, RITS	58	-
Durgapura	NWPZ	ITS, ILS	38	-
Kanpur	NEPZ	ITS, RITS	32	-
Pusa	NEPZ	ITS, RITS	32	-
Sabour	NEPZ	ITS, RITS	32	-
Vijapur	CZ	RITS	8	6
Junagarh	CZ	RITS	8	6
Kota	CZ	RITS	8	6
Indore	CZ	RITS	8	6
Pune	PZ	ITS, RTS	34	24
Dharwad	PZ	ITS, RTS	34	24
Niphad	PZ	ITS, RTS	34	24
Wellington	SHZ	RITS	8	-
Total			**454**	**48**

Detail of samples in National Initial Varietal Trials

Trial	Condition	Samples Size	Zone	Station	Total Samples
NIVT 1A	ITS	98	NWPZ	Ludhiana, Delhi, Hisar, Pantnagar, Durgapura	490
			NEPZ	Pusa, Sabour, Varanasi, Kanpur	392
NIVT 1B	ITS	98	NWPZ	Ludhiana, Delhi, Hisar, Durgapura, Pantnagar	490
			NEPZ	Samastipur, Kanpur, Varanasi	294
NIVT 2	ITS	72	CZ	Indore, Kota, Vijapur, Junagarh, Powarkheda	360
			PZ	Pune, Dharwad, Niphad, Ugar	288
NIVT 3A	ILS	72	NWPZ	Ludhiana, Hisar, Pantanagar, Delhi, Durgapura	360
			NEPZ	Samastipur, Sabour, Varanasi	216
NIVT 3B	ILS	72	CZ	Indore, Vijapur, Junagarh, Powarkheda	288
			PZ	Pune, Dharwad, Niphad	216
NIVT 4	ITS	72	CZ	Indore, Kota, Vijapur, Junagarh, Powarkheda	360
			PZ	Dharwad, Niphad, Pune, Ugar	288
NIVT 5A	RITS	72	NWPZ	Ludhiana, Delhi, Hisar, Pantnagar	288
			NEPZ	Kanpur, Sabour, Pusa, Varanasi	288
			CZ	Kota, Indore, Junagarh, Vijapur	288
			PZ	Niphad, Dharwad, Pune	216
NIVT 5B	RITS	50	CZ	Kota, Indore	100
			PZ	Dharwad, Niphad, Pune, Bagolkot	200
IVT	ITS	48	NHZ	Almora, Shimla, Malan	144
	RTS	48	NHZ	Almora, Shimla, Malan	144
	RES	24	NHZ	Almora, Shimla, Malan	72
	RILS	22	NHZ	Almora, Shimla, Malan	66
	RITS	36	SHZ	Wellington	36
Total					**5884**

Detail of samples in Special Trials

T.dicoccum	ITS	14	PZ	Arabhavi, Dharwad, Pune, Ugar, Kalloli	70
			SHZ	Wellington	14
Salinity/ alkalinity	ITS	20	NWPZ	Hisar, Karnal	40
			NEPZ	Kanpur	20
Triticale	RTS	16	NHZ	Shimla, Malan	32
MABB	ITS	14	NWPZ	Ludhiana, Delhi, Durgapura, Pantnagar, Hisar	70
Very Late Sown	VLS	22	NWPZ	Ludhiana, Delhi, Hisar, Pantnagar	104
			NEPZ	Pusa, Sabour, Varanasi	78
Total					**428**

Detail of Samples in Nurseries

QCSN	ITS	130	NHZ	Almora	130
			NWPZ	Ludhiana, Durgapura, Delhi, Pantnagar, Karnal	770
			NEPZ	Pusa	130
			CZ	Junagarh, Vijapur	260
			PZ	Pune, Dharwad	260
National Wheat Nurseries					
NGSN					206
EIGN					216
NDSN					160
Total					**2132**
Grand Total					**8946**

SECTION A

ADVANCE VARIETAL TRAILS

i. Grain Appearance

ii. Test Weight

iii. Protein Content

iv. Grain Hardness Index

v. Sedimentation Value

vi. Moisture Content

vii. Yellow Berry Incidence

viii. Yellow Pigment Content

ix. High Molecular Weight Glutenin Subunits and γ- Gliadin

ADVANCED VARIETAL TRIALS (*Triticumaestivum*)

GRAIN CHARACTERSTICS

The *Triticum aestivum* entries were tested under Irrigated Timely Sown (ITS), Irrigated Late Sown (ILS) and Restricted Irrigation Timely Sown (RITS) conditions in North Western Plains Zone (NWPZ). The trial was conducted under two conditions namely Irrigated Timely Sown (ITS) and Restricted Irrigation Timely Sown (RITS) conditions of North Eastern Plains Zone (NEPZ). The entries were tested under Restricted Irrigation Timely Sown (RITS) condition of Central Zone (CZ). The entries were tested under Irrigated Timely Sown (ITS) and Rainfed Timely Sown (RTS) conditions in Peninsular Zone (PZ). There were entries under Restricted Irrigated Timely Sown (RITS) condition in Southern Hills Zone (SHZ). All the entries in Northern Hills Zone (NHZ) were included in IVT Trial.

(i) Grain Appearance Score (Table 1-5)

It is a subjective test and an important parameter in grain trade and for this grain size, shape, soundness, colour & lustre are collectively taken into consideration to judge the grain appearance out of total score of 10.0.

(ii) Test Weight (Table 6-10)

This parameter merits consideration for millers as it is positively correlated with flour recovery. Bread wheat with 76.4 kg/hl and above test weight is classified in grade-I in U.S. system of grain trading. In Canadian system, the threshold value is 78.0 kg/hl. It is a very important parameter of wheat trading in the international market.

(iii) Grain Protein Content (Table 11-15)

It is an important parameter for making different products of bread wheat. The protein requirements are >12.0 %, 10.0-12.0 and <10.0 % for making good quality bread, chapatti and biscuit respectively.

(iv) Grain Hardness Index (Table 16-20)

Grain Hardness is an important parameter for making various wheat products, as hard wheat (>75 index) is required for making good bread & chapatti and soft wheat (<45 index) for good quality biscuit. The percentage of hard textured entries including checks recording >75 index was 67.5 %. The percentage of medium hard wheat entries was 29.5. Two entries (3.3 %) namely DBW 168 and HS 611 found soft textured exhibiting <45 index.

(v) Sedimentation Value (Table 21-25)

This quality parameter gives an idea of gluten strength. For making good quality bread, chapatti and biscuit, the required sedimentation values are >60 ml, 30 ml, 60 ml and <30 ml respectively.

(vi) Moisture Content (Table 26-30)

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

(vii) High Molecular Weight Glutenin Subunits (*HMWGS*) of *T.aestivum* AVTs (Table 31-35)

Sixty one (61), 2nd and 1st year entries including checks were evaluated for HMWGS composition from various sowing conditions of different zones of the country. The number of units varied from 3 to 5 in each entry. The percent entries having 3, 4 and 5 subunits were 5.0 %, 47.5 % and 47.5 % respectively. Subunits 5+10 were present in 73.8 % of the total entries whereas 2+12 in 26.2 % entries. More number of entries had 5+10 subunits in all the zones. Subunits 1, 2* and N were present in 23.0 %, 68.9 % and 8.1 % of the total entries respectively. Subunit 2* was more prevalent in all the zones. The subunits 7, 7+8, 7+9, 17+18, 20 and 13+16 were present in 34.4 %, 13.1 %, 9.8 %, 36.1 %, 3.3 % and 3.3 % of the total entries respectively. The percent entries having Glu-1 score 4, 5, 6, 7, 8, 9 and 10 were 4.9, 0.0, 6.6, 4.9, 45.9, 4.9 and 32.8 respectively. Maximum entries had Glu-1 score of 8.

Table 1: Grain appearance (Max-10) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	6.2	6.1	6.1	6.0	6.5	**6.2**
2. WH 1105 (C)	6.1	6.0	6.6	6.3	6.4	**6.3**
3. DBW 88 (C)	6.4	6.3	6.9	6.0	6.8	**6.5**
4. HD 3086 (C)	6.5	6.4	7.0	6.3	6.9	**6.6**
5. DBW 189	6.4	6.4	6.8	6.3	6.7	**6.5**
6. DBW 196	6.5	6.2	6.9	6.5	6.7	**6.6**
7. PBW 750	6.6	6.5	6.6	6.6	6.6	**6.6**
8. WH 1202	6.5	6.3	6.7	6.4	6.8	**6.5**
9. HD 3226	6.4	6.4	7.0	6.3	6.9	**6.6**
10. UP 2942	6.0	6.3	7.2	6.5	6.5	**6.5**
11. HP 1963	5.9	6.2	6.7	6.2	6.6	**6.3**
12. BRW 3773	6.6	6.2	6.8	6.3	6.8	**6.5**
Mean	**6.3**	**6.3**	**6.8**	**6.3**	**6.7**	**6.5**
Irrigated, Late Sown						
1. DBW 173	6.1	6.4	6.3	5.7	6.3	**6.2**
2. HD 3059 (C)	6.3	6.3	6.4	5.9	6.0	**6.2**
3. DBW 90 (C)	6.2	6.2	6.2	6.0	6.0	**6.1**
4. WH 1021 (C)	5.6	6.4	6.3	5.7	5.2	**5.8**
5. WH 1124 (C)	5.9	6.4	6.6	5.4	5.9	**6.0**
6. PBW 752	6.5	6.5	6.8	5.5	6.1	**6.3**
7. HI 1617	6.3	6.2	6.6	5.7	6.0	**6.2**
Mean	**6.1**	**6.3**	**6.5**	**5.7**	**5.9**	**6.1**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	6.4	-	6.5	6.2	6.3	**6.4**
2. PBW 644 (C)	6.2	-	6.6	6.2	6.2	**6.3**
3. HD 3043 (C)	6.0	-	6.3	6.0	6.4	**6.2**
4. WH 1142 (C)	5.9	-	6.0	6.4	6.7	**6.3**
5. HD 3237	6.7	-	6.4	6.6	6.9	**6.7**
6. HI 1619	6.6	-	6.5	6.1	6.4	**6.4**
7. HI 1620	6.3	-	7.0	7.2	6.3	**6.7**
8. CG 1023	6.5	-	7.3	6.4	7.0	**6.8**
9. MP 1318	6.7	-	6.5	6.9	6.6	**6.7**
10. MACS 6677	6.8	-	6.3	6.4	6.8	**6.6**
Mean	**6.4**	**-**	**6.5**	**6.4**	**6.6**	**6.5**

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

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	6.4	6.2	5.7	**6.1**
2. K 0307 (C)	6.7	6.2	5.9	**6.3**
3. DBW 39 (C)	6.4	6.4	5.8	**6.2**
4. K 1006 (C)	6.8	6.3	5.6	**6.2**
5. HD 2967 (C)	6.7	5.8	5.4	**6.0**
6. DBW 187	6.8	6.4	5.8	**6.3**
7. HD 3219	6.7	6.0	5.6	**6.1**
Mean	**6.6**	**6.2**	**5.7**	**6.2**
Restricted Irrigation, Timely Sown				
1. HI 1612	6.7	6.1	5.9	**6.2**
2. HD 2888 (C)	6.9	6.3	6.0	**6.4**
3. C 306 (C)	7.0	6.4	6.1	**6.5**
4. K 8027 (C)	7.2	6.4	6.2	**6.6**
5. HD 3171 (I)	6.8	6.2	6.1	**6.4**
6. K 1317 (I)	6.7	6.3	6.1	**6.4**
7. HI 1620	6.6	6.3	5.8	**6.2**
8. HS 611	6.4	6.2	5.5	**6.0**
9. UAS 384	6.5	6.2	6.0	**6.2**
Mean	**6.8**	**6.3**	**6.0**	**6.3**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	7.0	6.4	6.9	6.5	**6.7**
2. DBW 110 (C)	7.1	6.1	6.3	6.8	**6.6**
3. BRW 3775	6.9	6.0	6.5	6.4	**6.5**
4. UAS 385	7.1	6.2	6.2	6.4	**6.5**
Mean	**7.0**	**6.2**	**6.5**	**6.5**	**6.6**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	5.9	6.4	6.3	**6.2**
2. MACS 6478 (C)	5.8	6.3	6.5	**6.2**
3. MACS 6222 (C)	6.1	6.7	6.4	**6.4**
4. GW 322 (C)	6.2	6.5	6.7	**6.5**
5. UAS 304 (C)	5.8	6.6	6.7	**6.4**
Mean	**6.0**	**6.5**	**6.5**	**6.3**
Rainfed, Timely Sown				
1. UAS 375	6.3	5.8	6.3	**6.1**
2. NI 5439 (C)	6.0	5.7	6.5	**6.1**
3. NIAW 1415 (C)	6.0	6.1	6.6	**6.2**
Mean	**6.1**	**5.9**	**6.5**	**6.1**

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

Variety	Wellington	Mean
Restricted Irrigation, Timely Sown		
1. HW 2044 (C)	5.6	**5.6**
2. CoW (W) 1 (C)	5.8	**5.8**
3. HW 5216 (C)	6.2	**6.2**
4. UAS 387	6.0	**6.0**
Mean	**5.9**	**5.9**

Table 6: Test Weight (kg/hl) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	80.5	79.0	79.0	81.2	79.5	**79.8**
2. WH 1105 (C)	81.5	78.0	81.3	81.3	79.5	**80.3**
3. DBW 88 (C)	80.0	78.8	80.0	81.0	77.0	**79.4**
4. HD 3086 (C)	81.5	79.5	80.7	82.0	82.5	**81.2**
5. DBW 189	80.0	77.7	77.5	79.5	80.0	**78.9**
6. DBW 196	82.0	79.5	80.0	81.6	82.0	**81.0**
7. PBW 750	82.0	80.0	82.2	81.0	81.5	**81.3**
8. WH 1202	81.0	77.6	80.7	81.5	82.5	**80.7**
9. HD 3226	81.5	78.3	80.0	80.5	80.5	**80.2**
10. UP 2942	78.0	79.0	80.3	81.0	80.5	**79.8**
11. HP 1963	80.5	78.5	80.4	80.0	82.0	**80.3**
12. BRW 3773	81.0	77.5	81.6	80.8	82.0	**80.6**
Mean	**80.8**	**78.6**	**80.3**	**81.0**	**80.8**	**80.3**
Irrigated, Late Sown						
1. DBW 173	78.5	78.5	77.5	76.3	75.0	**77.2**
2. HD 3059 (C)	80.5	80.0	81.0	77.0	77.0	**79.1**
3. DBW 90 (C)	79.0	78.0	78.0	77.0	75.0	**77.4**
4. WH 1021 (C)	80.5	79.0	79.5	78.0	73.0	**78.0**
5. WH 1124 (C)	79.0	78.2	79.5	77.0	75.0	**77.7**
6. PBW 752	81.5	79.5	81.5	79.0	80.5	**80.4**
7. HI 1617	81.5	79.5	79.5	78.8	78.5	**79.6**
Mean	**80.1**	**79.0**	**79.5**	**77.6**	**76.3**	**78.5**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	79.0	-	78.0	79.2	81.5	**79.4**
2. PBW 644 (C)	78.5	-	80.5	80.4	82.0	**80.4**
3. HD 3043 (C)	79.0	-	80.0	82.6	83.5	**81.3**
4. WH 1142 (C)	79.0	-	77.5	81.0	83.5	**80.3**
5. HD 3237	80.0	-	80.0	81.6	82.0	**80.9**
6. HI 1619	77.0	-	76.0	80.0	81.5	**78.6**
7. HI 1620	80.0	-	79.5	80.5	82.0	**80.5**
8. CG 1023	81.0	-	81.0	81.5	82.0	**81.4**
9. MP 1318	81.0	-	82.8	83.0	83.0	**82.5**
10. MACS 6677	81.0	-	78.5	81.3	83.5	**81.1**
Mean	**79.6**	**-**	**79.4**	**81.1**	**82.5**	**80.6**

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

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	80.5	83.3	74.0	**79.3**
2. K 0307 (C)	82.5	79.0	76.0	**79.2**
3. DBW 39 (C)	81.5	80.3	72.5	**78.1**
4. K 1006 (C)	81.5	83.5	74.0	**79.7**
5. HD 2967 (C)	80.0	76.3	72.0	**76.1**
6. DBW 187	81.5	79.0	73.0	**77.8**
7. HD 3219	82.0	80.0	73.5	**78.5**
Mean	**81.4**	**80.2**	**73.6**	**78.4**
Restricted Irrigation, Timely Sown				
1. HI 1612	81.5	80.7	76.7	**79.6**
2. HD 2888 (C)	80.0	82.5	78.6	**80.4**
3. C 306 (C)	83.0	83.0	79.5	**81.8**
4. K 8027 (C)	82.5	82.5	79.5	**81.5**
5. HD 3171 (I)	82.5	80.5	78.0	**80.3**
6. K 1317 (I)	83.5	82.0	79.5	**81.7**
7. HI 1620	82.5	80.7	77.0	**80.1**
8. HS 611	82.0	79.0	76.3	**79.1**
9. UAS 384	82.0	80.0	76.0	**79.3**
Mean	**82.2**	**81.2**	**77.9**	**80.4**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	82.7	82.5	81.0	81.0	**81.8**
2. DBW 110 (C)	81.6	80.0	78.0	79.5	**79.8**
3. BRW 3775	80.5	79.5	77.0	76.7	**78.4**
4. UAS 385	82.2	81.0	78.7	79.5	**80.4**
Mean	**81.8**	**80.8**	**78.7**	**79.2**	**80.1**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	76.0	79.3	81.0	**78.8**
2. MACS 6478 (C)	77.3	79.5	82.0	**79.6**
3. MACS 6222 (C)	80.5	81.6	83.2	**81.8**
4. GW 322 (C)	77.0	78.6	81.4	**79.0**
5. UAS 304 (C)	78.5	80.3	81.6	**80.1**
Mean	**77.9**	**79.9**	**81.8**	**79.9**
Rainfed, Timely Sown				
1. UAS 375	79.5	76.5	82.3	**79.4**
2. NI 5439 (C)	79.2	78.0	80.7	**79.3**
3. NIAW 1415 (C)	80.5	78.6	82.0	**80.4**
Mean	**79.7**	**77.7**	**81.7**	**79.7**

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

Variety	Wellington	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	74.0	**74.0**
2. CoW (W) 1 (C)	76.3	**76.3**
3. HW 5216 (C)	80.0	**80.0**
4. UAS 387	76.8	**76.8**
Mean	**76.8**	**76.8**

Table 11: Protein Content (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	10.18	13.48	12.06	9.40	9.79	**10.98**
2. WH 1105 (C)	10.43	13.06	12.55	10.63	11.56	**11.65**
3. DBW 88 (C)	11.03	13.77	12.73	10.28	10.93	**11.75**
4. HD 3086 (C)	10.26	12.96	12.50	10.19	10.46	**11.27**
5. DBW 189	11.52	14.31	12.59	10.66	10.54	**11.92**
6. DBW 196	10.40	13.22	12.47	10.83	10.04	**11.39**
7. PBW 750	10.17	13.29	12.02	10.97	9.92	**11.27**
8. WH 1202	10.49	14.33	12.40	10.82	11.97	**12.00**
9. HD 3226	11.19	14.90	13.34	11.44	12.56	**12.69**
10. UP 2942	11.00	13.35	12.48	10.11	11.51	**11.69**
11. HP 1963	10.03	12.62	11.72	9.32	9.38	**10.61**
12. BRW 3773	10.97	12.64	12.51	10.89	12.65	**11.93**
Mean	**10.64**	**13.49**	**12.45**	**10.46**	**10.94**	**11.60**
Irrigated, Late Sown						
1. DBW 173	11.19	13.29	12.54	11.72	12.75	**12.30**
2. HD 3059 (C)	11.12	12.24	12.13	12.03	12.30	**11.96**
3. DBW 90 (C)	10.95	12.29	12.78	10.92	12.46	**11.88**
4. WH 1021 (C)	11.42	12.73	12.46	11.87	12.89	**12.27**
5. WH 1124 (C)	11.42	12.80	11.92	11.23	12.40	**11.95**
6. PBW 752	11.70	13.13	13.52	11.61	11.83	**12.36**
7. HI 1617	9.13	11.78	12.20	10.62	11.22	**10.99**
Mean	**10.99**	**12.61**	**12.51**	**11.43**	**12.26**	**11.96**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	12.75	-	12.20	10.99	10.19	**11.53**
2. PBW 644 (C)	13.29	-	10.08	11.23	9.69	**11.07**
3. HD 3043 (C)	13.49	-	13.09	10.57	10.54	**11.92**
4. WH 1142 (C)	11.97	-	13.21	10.09	10.02	**11.32**
5. HD 3237	12.17	-	10.54	10.31	9.81	**10.71**
6. HI 1619	11.80	-	11.81	9.58	9.35	**10.64**
7. HI 1620	12.83	-	11.95	11.12	11.04	**11.74**
8. CG 1023	12.49	-	12.51	12.40	10.00	**11.85**
9. MP 1318	12.91	-	11.43	10.74	11.02	**11.53**
10. MACS 6677	12.61	-	12.81	9.89	9.29	**11.15**
Mean	**12.63**	**-**	**11.96**	**10.69**	**10.10**	**11.35**

Table 12: Protein Content (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	9.83	12.57	12.48	**11.63**
2. K 0307 (C)	10.19	11.79	11.52	**11.17**
3. DBW 39 (C)	10.21	11.61	12.46	**11.43**
4. K 1006 (C)	9.22	11.33	11.81	**10.79**
5. HD 2967 (C)	10.14	13.94	12.85	**12.31**
6. DBW 187	9.83	12.16	12.43	**11.47**
7. HD 3219	10.05	11.88	12.64	**11.52**
Mean	**9.92**	**12.18**	**12.31**	**11.47**
Restricted Irrigation, Timely Sown				
1. HI 1612	11.12	10.80	8.84	**10.25**
2. HD 2888 (C)	13.04	12.05	10.39	**11.83**
3. C 306 (C)	11.51	11.54	9.32	**10.79**
4. K 8027 (C)	11.99	11.16	10.02	**11.06**
5. HD 3171 (I)	11.83	10.48	10.42	**10.91**
6. K 1317 (I)	11.73	11.52	10.36	**11.20**
7. HI 1620	12.42	11.27	9.93	**11.21**
8. HS 611	12.27	11.09	10.62	**11.33**
9. UAS 384	11.81	11.24	9.37	**10.81**
Mean	**11.97**	**11.24**	**9.92**	**11.04**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	10.46	10.54	14.61	12.71	**12.08**
2. DBW 110 (C)	9.64	8.28	14.36	12.65	**11.23**
3. BRW 3775	9.56	9.38	14.31	12.24	**11.37**
4. UAS 385	9.72	9.86	14.57	12.05	**11.55**
Mean	**9.85**	**9.52**	**14.46**	**12.41**	**11.56**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	13.21	13.54	13.03	**13.26**
2. MACS 6478 (C)	12.36	12.24	12.41	**12.34**
3. MACS 6222 (C)	12.22	12.46	12.29	**12.32**
4. GW 322 (C)	10.94	11.54	11.17	**11.22**
5. UAS 304 (C)	11.86	12.06	12.22	**12.05**
Mean	**12.12**	**12.37**	**12.22**	**12.24**
Rainfed, Timely Sown				
1. UAS 375	14.19	14.80	13.26	**14.08**
2. NI 5439 (C)	13.96	15.08	12.56	**13.87**
3. NIAW 1415 (C)	14.65	14.73	13.02	**14.13**
Mean	**14.27**	**14.87**	**12.95**	**14.03**

Table 15: Protein Content (%) of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	11.47	**11.47**
2. CoW (W) 1 (C)	12.41	**12.41**
3. HW 5216 (C)	12.02	**12.02**
4. UAS 387	12.87	**12.87**
Mean	**12.19**	**12.19**

Table 16: Grain Hardness Index of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	73	73	80	78	71	**75**
2. WH 1105 (C)	68	85	74	74	76	**76**
3. DBW 88 (C)	76	84	76	82	79	**79**
4. HD 3086 (C)	73	80	75	84	69	**76**
5. DBW 189	65	72	77	68	73	**71**
6. DBW 196	75	87	76	76	71	**77**
7. PBW 750	73	81	80	75	65	**75**
8. WH 1202	74	87	80	82	73	**79**
9. HD 3226	74	81	76	80	76	**77**
10. UP 2942	65	65	68	70	61	**66**
11. HP 1963	62	83	73	65	65	**70**
12. BRW 3773	67	69	66	72	62	**68**
Mean	**71**	**79**	**75**	**75**	**70**	**74**
Irrigated, Late Sown						
1. DBW 173	74	73	77	76	85	**77**
2. HD 3059 (C)	83	79	81	76	90	**82**
3. DBW 90 (C)	81	79	86	82	89	**84**
4. WH 1021 (C)	69	72	79	70	85	**75**
5. WH 1124 (C)	80	76	86	85	86	**82**
6. PBW 752	76	78	87	73	78	**78**
7. HI 1617	66	71	70	61	76	**69**
Mean	**76**	**75**	**81**	**75**	**84**	**78**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	72	-	77	75	67	**73**
2. PBW 644 (C)	76	-	78	78	73	**76**
3. HD 3043 (C)	89	-	89	83	79	**85**
4. WH 1142 (C)	86	-	81	80	75	**81**
5. HD 3237	70	-	69	73	68	**70**
6. HI 1619	77	-	86	72	63	**74**
7. HI 1620	74	-	77	77	64	**73**
8. CG 1023	75	-	83	81	74	**78**
9. MP 1318	75	-	75	70	68	**72**
10. MACS 6677	80	-	82	70	73	**76**
Mean	**77**	**-**	**80**	**76**	**70**	**76**

Table 17: Grain Hardness Index of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	73	83	84	**80**
2. K 0307 (C)	82	90	85	**86**
3. DBW 39 (C)	73	85	79	**79**
4. K 1006 (C)	69	86	88	**81**
5. HD 2967 (C)	80	94	70	**81**
6. DBW 187	75	79	77	**77**
7. HD 3219	68	71	73	**71**
Mean	**74**	**84**	**80**	**79**
Restricted Irrigation, Timely Sown				
1. HI 1612	72	89	83	**81**
2. HD 2888 (C)	71	90	93	**85**
3. C 306 (C)	72	96	94	**87**
4. K 8027 (C)	68	87	87	**81**
5. HD 3171 (I)	61	76	66	**67**
6. K 1317 (I)	65	81	74	**73**
7. HI 1620	61	77	78	**72**
8. HS 611	35	36	33	**35**
9. UAS 384	66	85	77	**76**
Mean	**63**	**80**	**76**	**73**

Table 18: Grain Hardness Index of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	79	75	80	81	**79**
2. DBW 110 (C)	70	66	83	78	**74**
3. BRW 3775	69	69	84	83	**76**
4. UAS 385	77	79	91	87	**83**
Mean	**74**	**72**	**85**	**82**	**78**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	42	33	42	**39**
2. MACS 6478 (C)	74	78	79	**77**
3. MACS 6222 (C)	87	80	80	**82**
4. GW 322 (C)	83	79	82	**81**
5. UAS 304 (C)	88	79	72	**80**
Mean	**75**	**70**	**71**	**72**
Rainfed, Timely Sown				
1. UAS 375	89	89	86	**88**
2. NI 5439 (C)	89	79	79	**82**
3. NIAW 1415 (C)	89	86	83	**86**
Mean	**89**	**84**	**83**	**85**

Table 20: Grain Hardness Index of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	83	**83**
2. CoW (W) 1 (C)	92	**92**
3. HW 5216 (C)	82	**82**
4. UAS 387	89	**89**
Mean	**87**	**87**

Table 21: Sedimentation Value (ml) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	62	64	54	65	61	**61**
2. WH 1105 (C)	63	61	56	61	64	**61**
3. DBW 88 (C)	60	65	53	62	63	**61**
4. HD 3086 (C)	54	62	53	55	57	**56**
5. DBW 189	60	62	54	63	63	**60**
6. DBW 196	60	60	63	66	59	**62**
7. PBW 750	50	56	49	52	50	**51**
8. WH 1202	53	60	54	57	56	**56**
9. HD 3226	64	63	52	64	63	**61**
10. UP 2942	60	51	50	55	52	**54**
11. HP 1963	45	50	43	46	46	**46**
12. BRW 3773	60	62	52	61	57	**58**
Mean	**58**	**60**	**53**	**59**	**58**	**57**
Irrigated, Late Sown						
1. DBW 173	63	66	66	61	60	**63**
2. HD 3059 (C)	60	54	60	64	60	**60**
3. DBW 90 (C)	66	56	55	64	59	**60**
4. WH 1021 (C)	38	42	45	43	45	**43**
5. WH 1124 (C)	60	56	62	65	54	**59**
6. PBW 752	63	62	63	62	58	**62**
7. HI 1617	63	64	58	62	59	**61**
Mean	**59**	**57**	**58**	**60**	**56**	**58**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	61	-	62	63	55	**60**
2. PBW 644 (C)	51	-	50	45	46	**48**
3. HD 3043 (C)	50	-	43	42	44	**45**
4. WH 1142 (C)	51	-	47	46	43	**47**
5. HD 3237	56	-	51	52	50	**52**
6. HI 1619	56	-	45	53	45	**50**
7. HI 1620	64	-	62	64	63	**63**
8. CG 1023	60	-	54	57	58	**57**
9. MP 1318	52	-	47	49	44	**48**
10. MACS 6677	64	-	62	60	60	**62**
Mean	**57**	**-**	**52**	**53**	**51**	**53**

Table 22: Sedimentation Value (ml) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	44	50	48	**47**
2. K 0307 (C)	38	43	45	**42**
3. DBW 39 (C)	47	49	45	**47**
4. K 1006 (C)	39	43	45	**42**
5. HD 2967 (C)	65	60	61	**62**
6. DBW 187	60	62	64	**62**
7. HD 3219	48	59	55	**54**
Mean	**49**	**52**	**52**	**51**
Restricted Irrigation, Timely Sown				
1. HI 1612	62	64	66	**64**
2. HD 2888 (C)	45	51	47	**48**
3. C 306 (C)	40	48	42	**43**
4. K 8027 (C)	40	50	46	**45**
5. HD 3171 (I)	65	68	66	**66**
6. K 1317 (I)	53	60	57	**57**
7. HI 1620	59	62	66	**62**
8. HS 611	57	65	60	**61**
9. UAS 384	48	53	54	**52**
Mean	**52**	**58**	**56**	**55**

Table 23: Sedimentation Value (ml) of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	56	58	60	54	**57**
2. DBW 110 (C)	54	56	57	54	**55**
3. BRW 3775	66	57	60	65	**62**
4. UAS 385	52	51	50	45	**50**
Mean	**57**	**56**	**57**	**55**	**56**

Table 24: Sedimentation Value (ml) of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	42	41	36	**40**
2. MACS 6478 (C)	45	50	50	**48**
3. MACS 6222 (C)	40	41	43	**41**
4. GW 322 (C)	40	43	39	**41**
5. UAS 304 (C)	48	51	45	**48**
Mean	**43**	**45**	**43**	**44**
Rainfed, Timely Sown				
1. UAS 375	57	53	42	**51**
2. NI 5439 (C)	61	63	60	**61**
3. NIAW 1415 (C)	48	53	49	**50**
Mean	**55**	**56**	**50**	**54**

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

Variety	Wellington	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	46	**46**
2. CoW (W) 1 (C)	43	**43**
3. HW 5216 (C)	42	**42**
4. UAS 387	43	**43**
Mean	**44**	**44**

Table 26: Moisture Content (%) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	9.02	8.11	8.75	10.51	7.21	**8.72**
2. WH 1105 (C)	8.92	7.74	8.55	10.65	7.77	**8.73**
3. DBW 88 (C)	9.41	8.59	8.83	10.62	8.04	**9.10**
4. HD 3086 (C)	9.28	7.75	8.59	10.70	7.50	**8.76**
5. DBW 189	9.28	8.74	9.69	10.85	7.52	**9.22**
6. DBW 196	9.13	8.14	9.04	10.49	7.80	**8.92**
7. PBW 750	9.48	8.49	9.23	10.84	7.73	**9.15**
8. WH 1202	9.12	8.55	8.59	10.54	7.56	**8.87**
9. HD 3226	9.09	8.17	8.68	10.73	7.93	**8.92**
10. UP 2942	9.59	8.67	9.45	10.89	8.04	**9.33**
11. HP 1963	9.12	7.93	8.83	10.68	7.11	**8.73**
12. BRW 3773	9.34	8.18	8.60	10.60	7.80	**8.90**
Mean	**9.23**	**8.26**	**8.90**	**10.68**	**7.67**	**8.95**
Irrigated, Late Sown						
1. DBW 173	9.12	8.49	8.42	10.97	7.65	**8.93**
2. HD 3059 (C)	9.38	7.64	8.52	10.98	7.41	**8.79**
3. DBW 90 (C)	9.18	9.30	8.47	11.01	7.59	**9.11**
4. WH 1021 (C)	9.01	8.14	8.06	10.80	7.53	**8.71**
5. WH 1124 (C)	9.00	8.55	8.31	11.17	7.50	**8.91**
6. PBW 752	9.18	8.14	8.39	10.96	7.63	**8.86**
7. HI 1617	8.70	8.15	8.64	11.04	7.66	**8.84**
Mean	**9.08**	**8.34**	**8.40**	**10.99**	**7.57**	**8.88**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	8.98	-	7.64	10.53	7.66	**8.70**
2. PBW 644 (C)	9.19	-	7.53	10.54	8.17	**8.86**
3. HD 3043 (C)	8.63	-	7.18	10.56	7.87	**8.56**
4. WH 1142 (C)	8.89	-	6.94	10.38	7.69	**8.48**
5. HD 3237	8.99	-	7.36	10.41	7.78	**8.64**
6. HI 1619	9.15	-	7.45	10.54	7.52	**8.67**
7. HI 1620	9.01	-	7.72	10.65	8.01	**8.85**
8. CG 1023	8.99	-	7.64	10.40	7.27	**8.58**
9. MP 1318	9.31	-	7.44	10.69	7.35	**8.70**
10. MACS 6677	9.07	-	7.26	10.90	7.03	**8.57**
Mean	**9.02**	**-**	**7.42**	**10.56**	**7.64**	**8.66**

Table 27: Moisture Content (%) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	8.55	13.05	12.44	**11.35**
2. K 0307 (C)	9.89	13.00	12.51	**11.80**
3. DBW 39 (C)	8.43	13.10	12.27	**11.27**
4. K 1006 (C)	8.58	13.11	12.37	**11.35**
5. HD 2967 (C)	8.30	12.91	12.25	**11.15**
6. DBW 187	8.42	12.95	12.41	**11.26**
7. HD 3219	8.63	13.03	12.22	**11.29**
Mean	**8.69**	**13.02**	**12.35**	**11.35**
Restricted Irrigation, Timely Sown				
1. HI 1612	8.15	13.03	11.94	**11.04**
2. HD 2888 (C)	7.34	12.93	11.90	**10.72**
3. C 306 (C)	7.55	13.11	12.40	**11.02**
4. K 8027 (C)	7.74	13.01	12.11	**10.95**
5. HD 3171 (I)	8.49	12.91	11.86	**11.09**
6. K 1317 (I)	8.33	13.26	12.00	**11.20**
7. HI 1620	8.01	12.89	11.91	**10.94**
8. HS 611	7.01	12.74	11.94	**10.56**
9. UAS 384	8.10	13.14	12.07	**11.10**
Mean	**7.86**	**13.00**	**12.01**	**10.96**

Table 28: Moisture Content (%) of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	7.78	7.31	8.74	8.53	**8.09**
2. DBW 110 (C)	7.52	7.42	8.59	8.61	**8.04**
3. BRW 3775	7.94	7.23	8.90	8.55	**8.16**
4. UAS 385	7.83	7.47	8.73	8.44	**8.12**
Mean	**7.77**	**7.36**	**8.74**	**8.53**	**8.10**

Table 29: Moisture Content (%) of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	8.74	8.40	7.90	**8.35**
2. MACS 6478 (C)	9.15	9.31	8.63	**9.03**
3. MACS 6222 (C)	8.99	8.96	8.78	**8.91**
4. GW 322 (C)	9.26	9.42	8.48	**9.05**
5. UAS 304 (C)	9.23	9.18	8.35	**8.92**
Mean	**9.07**	**9.05**	**8.43**	**8.85**
Rainfed, Timely Sown				
1. UAS 375	9.15	8.08	8.42	**8.55**
2. NI 5439 (C)	9.16	7.69	8.03	**8.29**
3. NIAW 1415 (C)	9.31	7.94	8.16	**8.47**
Mean	**9.21**	**7.90**	**8.20**	**8.44**

Table 30: Moisture Content (%) of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	13.47	**13.47**
2. CoW (W) 1 (C)	12.75	**12.75**
3. HW 5216 (C)	13.13	**13.13**
4. UAS 387	13.06	**13.06**
Mean	**13.10**	**13.10**

Table 31: High Molecular Weight Glutenin Subunits of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
Irrigated, Timely Sown				
1. HD 2967 (C)	5+10	2*	17+18	**10**
2. WH 1105 (C)	5+10	2*	7	**8**
3. DBW 88 (C)	5+10	2*	17+18	**10**
4. HD 3086 (C)	5+10	1	17+18	**10**
5. DBW 189	5+10	2*	7	**8**
6. DBW 196	5+10	2*	17+18	**10**
7. PBW 750	5+10	2*	7	**8**
8. WH 1202	5+10	1	17+18	**10**
9. HD 3226	5+10	1	13+16	**10**
10. UP 2942	2+12	2*	17+18	**8**
11. HP 1963	2+12	2*	7	**6**
12. BRW 3773	5+10	2*	7	**8**
Irrigated, Late Sown				
1. DBW 173	5+10	2*	17+18	**10**
2. HD 3059 (C)	5+10	2*	17+18	**10**
3. DBW 90 (C)	5+10	1	17+18	**10**
4. WH 1021 (C)	2+12	2*	7+8	**8**
5. WH 1124 (C)	5+10	1	17+18	**10**
6. PBW 752	5+10	2*	17+18	**10**
7. HI 1617	5+10	2*	17+18	**10**
Restricted Irrigation, Timely Sown				
1. WH 1080 (C)	5+10	1	7	**8**
2. PBW 644 (C)	2+12	1	7+8	**8**
3. HD 3043 (C)	5+10	2*	7	**8**
4. WH 1142 (C)	5+10	1	7	**8**
5. HD 3237	5+10	2*	7	**8**
6. HI 1619	5+10	2*	7+8	**10**
7. HI 1620	5+10	2*	17+18	**10**
8. CG 1023	5+10	2*	7+8	**10**
9. MP 1318	2+12	N	7+8	**6**
10. MACS 6677	5+10	2*	7	**8**

Table 32: High Molecular Weight Glutenin Subunits of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
Irrigated, Timely Sown				
1. HD 2733 (C)	5+10	2*	7+9	**9**
2. K 0307 (C)	2+12	2*	17+18	**8**
3. DBW 39 (C)	5+10	2*	7+9	**9**
4. K 1006 (C)	2+12	2*	17+18	**8**
5. HD 2967 (C)	5+10	2*	17+18	**10**
6. DBW 187	5+10	2*	17+18	**10**
7. HD 3219	5+10	2*	7	**8**
Restricted Irrigation, Timely Sown				
1. HI 1612	5+10	2*	7	**8**
2. HD 2888 (C)	2+12	N	20	**4**
3. C 306 (C)	2+12	N	20	**4**
4. K 8027 (C)	2+12	2*	17+18	**8**
5. HD 3171 (I)	5+10	2*	7	**8**
6. K 1317 (I)	2+12	N	7	**4**
7. HI 1620	5+10	2*	17+18	**10**
8. HS 611	5+10	1	13+16	**10**
9. UAS 384	2+12	2*	17+18	**8**

Table 33: High Molecular Weight Glutenin Subunits of *T.aestivum* genotypes in Central Zone AVT's

Variety	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
Restricted Irrigation, Timely Sown				
1. MP 3288 (C)	2+12	2*	7+9	**7**
2. DBW 110 (C)	5+10	1	7	**8**
3. BRW 3775	5+10	2*	7	**8**
4. UAS 385	5+10	2*	7+8	**10**

Table 34: High Molecular Weight Glutenin Subunits of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
Irrigated, Timely Sown				
1. DBW 168	2+12	2*	7	**6**
2. MACS 6478 (C)	2+12	2*	17+18	**8**
3. MACS 6222 (C)	2+12	2*	7+9	**7**
4. GW 322 (C)	2+12	2*	7+8	**8**
5. UAS 304 (C)	5+10	1	7	**8**
Rainfed, Timely Sown				
1. UAS 375	5+10	1	7	**8**
2. NI 5439 (C)	2+12	N	17+18	**6**
3. NIAW 1415 (C)	2+12	1	7+9	**7**

Table 35: High Molecular Weight Glutenin Subunits of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Glu-D1	Glu-A1	Glu-B1	Glu-1 Score
Restricted Irrigation,Timely Sown				
1. HW 2044 (C)	2+12	2*	7+8	**8**
2. CoW (W) 1 (C)	5+10	1	7+9	**9**
3. HW 5216 (C)	5+10	2*	7	**8**
4. UAS 387	5+10	2*	7	**8**

ADVANCED VARIETAL TRIALS (*Triticum durum*)

GRAIN CHARACTERSTICS

The *T. durum* entries were tested under Restricted Irrigation Timely Sown (RITS) condition in Central Zone (CZ) and Rainfed Timely Sown (RTS) condition in Peninsular Zone (PZ). Under RITS condition of CZ, two 1st year entries was tested against one durum check. In PZ, two 2nd year entries were tested against two durum checks under RTS condition.

(i) Grain Appearance Score (Table 36-37)

It is a subjective test and the parameters like grain size, shape, soundness, colour & luster are taken into consideration to score the grain appearance out of a total score of 10.0. This parameter merits consideration in grain trade.

(ii) Test Weight (Table 38-39)

This parameter is important for millers as it is positively correlated with flour recovery. It is an important quality parameter for durum wheat trading in the international market. In U.S grading system, durum wheat with >78.0 kg/hl test weight is classified in grade 1.

(iii) Protein Content (Table 40-41)

It is an important quality parameter for making different products of wheat. More than 12.0 % protein is required for making good quality pasta products.

(iv) Grain Hardness (Table 42-43)

It is an important parameter as hard durum wheat is required for making good quality pasta products. All the entries including checks were found to be hard as the index values were >75. There was no soft durum.

(v) Sedimentation Value (Table 44-45)

This quality parameter indicates gluten strength and the value of 40 ml and above is required for making good quality pasta products.

(vi) Yellow Berry Incidence (Table 46-47)

Yellow berry (starchiness, mealiness, non-virtuousness) is a physiological disorder due to protein imbalance and imparts undesirable white spots in dried pasta, thus lowering its cooking quality.

(vii) Yellow Pigment Content (Table 48-49)

It imparts attractive colour to the pasta products and is considered to be an important quality character of durum wheat in many countries. It is a precursor of vitamin-A, hence has immense nutritional importance.

(viii) Moisture Content (Table 50-51)

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

(ix) γ-gliadin (Table 52-53)

It is an important quality parameter for assessing the quality of pasta products. Durum wheat genotypes with γ-gliadin '45' make good quality pasta products whereas γ-gliadin '42' is negatively related. From this point of view, Indian durums are well placed as all the entries including checks had γ-gliadin '45' except entry UAS 462 (γ-gliadin 43.5).

Table 36: Grain Appearance (Max-10) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	7.8	6.8	6.1	6.8	**6.9**
2. UAS 462	7.8	6.4	6.2	7.1	**6.9**
3. HI 8791	7.3	6.8	6.0	7.3	**6.9**
Mean	**7.6**	**6.7**	**6.1**	**7.1**	**6.9**

Table 37: Grain Appearance (Max-10) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	6.8	6.6	6.9	**6.8**
2. MACS 4028	7.1	6.7	6.8	**6.9**
3. UAS 446 (C)	7.0	6.5	7.1	**6.9**
4. AKDW2997-16 (C)	6.7	6.4	7.3	**6.8**
Mean	**6.9**	**6.6**	**7.0**	**6.8**

Table 38: Test Weight (kg/hl) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	83.2	83.0	79.0	81.3	**81.6**
2. UAS 462	84.4	81.5	79.5	81.0	**81.6**
3. HI 8791	83.0	83.5	77.0	80.0	**80.9**
Mean	**83.5**	**82.7**	**78.5**	**80.8**	**81.4**

Table 39: Test Weight (kg/hl) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	80.0	79.5	80.7	**80.1**
2. MACS 4028	82.6	81.3	80.6	**81.5**
3. UAS 446 (C)	81.3	80.5	81.2	**81.0**
4. AKDW 2997-16 (C)	82.0	79.5	83.0	**81.5**
Mean	**81.5**	**80.2**	**81.4**	**81.0**

Table 40: Protein Content (%) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	10.73	10.01	14.98	14.64	**12.59**
2. UAS 462	10.51	10.06	14.69	14.43	**12.42**
3. HI 8791	10.18	10.48	14.82	13.94	**12.36**
Mean	**10.47**	**10.18**	**14.83**	**14.34**	**12.46**

Table 41: Protein Content (%) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	14.46	14.86	14.69	**14.67**
2. MACS 4028	14.38	14.84	14.31	**14.51**
3. UAS 446 (C)	14.02	15.10	14.46	**14.53**
4. AKDW 2997-16 (C)	13.63	14.65	12.07	**13.45**
Mean	**14.12**	**14.86**	**13.88**	**14.29**

Table 42: Grain Hardness Index of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	80	72	90	86	**82**
2. UAS 462	85	78	97	90	**88**
3. HI 8791	86	79	93	91	**87**
Mean	**84**	**76**	**93**	**89**	**86**

Table 43: Grain Hardness Index of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	85	92	85	**87**
2. MACS 4028	83	89	82	**84**
3. UAS 446 (C)	92	89	83	**88**
4. AKDW 2997-16 (C)	93	89	83	**88**
Mean	**88**	**90**	**83**	**87**

Table 44: Sedimentation Value (ml) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	34	32	33	31	**33**
2. UAS 462	40	41	40	36	**39**
3. HI 8791	37	39	37	34	**37**
Mean	**37**	**37**	**37**	**34**	**36**

Table 45: Sedimentation Value (ml) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	40	34	36	**37**
2. MACS 4028	28	27	26	**27**
3. UAS 446 (C)	41	46	40	**42**
4. AKDW 2997-16 (C)	41	39	35	**38**
Mean	**38**	**37**	**34**	**36**

Table 46: Yellow Berry Incidence (%) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	6.3	21.1	0.0	0.0	**6.9**
2. UAS 462	13.2	24.5	0.0	0.0	**9.4**
3. HI 8791	18.4	29.3	1.1	0.0	**12.2**
Mean	**12.6**	**25.0**	**0.4**	**0.0**	**9.49**

Table 47: Yellow Berry Incidence (%) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	0.0	0.0	0.0	**0.0**
2. MACS 4028	0.0	0.0	1.2	**0.4**
3. UAS 446 (C)	0.0	0.0	2.4	**0.8**
4. AKDW 2997-16 (C)	0.0	0.0	0.0	**0.0**
Mean	**0.0**	**0.0**	**0.9**	**0.3**

Table 48: Yellow Pigment Content (ppm) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	6.01	6.44	5.94	5.89	**6.07**
2. UAS 462	4.98	5.40	4.93	5.66	**5.24**
3. HI 8791	5.23	5.61	5.33	5.78	**5.49**
Mean	**5.41**	**5.82**	**5.40**	**5.78**	**5.60**

Table 49: Yellow Pigment Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	4.87	4.95	5.24	**5.02**
2. MACS 4028	4.56	4.18	4.36	**4.37**
3. UAS 446 (C)	5.12	5.09	5.31	**5.17**
4. AKDW 2997-16 (C)	3.59	3.59	3.87	**3.68**
Mean	**4.54**	**4.45**	**4.70**	**4.56**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	8.52	7.81	8.83	8.46	**8.41**
2. UAS 462	8.23	7.63	8.71	8.15	**8.18**
3. HI 8791	8.28	7.40	8.68	8.33	**8.17**
Mean	**8.34**	**7.61**	**8.74**	**8.31**	**8.25**

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

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	8.94	8.19	8.46	**8.53**
2. MACS 4028	9.17	8.43	8.55	**8.72**
3. UAS 446 (C)	9.13	8.16	8.80	**8.70**
4. AKDW 2997-16 (C)	8.73	7.64	8.84	**8.40**
Mean	**8.99**	**8.11**	**8.66**	**8.59**

Table 52: Y-gliadin of *T. durum* genotypes in Central Zone AVT's

Variety	Y-glidin
Restricted Irrigation, Timely Sown	
1. HI 8627 (C)	**45**
2. UAS 462	**43.5**
3. HI 8791	**45**

Table 53: Y-gliadin of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Y-glidin
Rainfed, Timely Sown	
1. HI 8777	**45**
2. MACS 4028	**45**
3. UAS 446 (C)	**45**
4. AKDW 2997-16 (C)	**45**

SECTION B

NATIONAL INITIAL VARIETAL TRIALS

i. NIVT 1A

ii. NIVT 1B

iii. NIVT 2

iv. NIVT 3A

v. NIVT 3B

vi. NIVT 4

vii. NIVT 5A

viii. NIVT 5B

ix. IVTs from NHZ and SHZ

NATIONAL INITIAL VARIETAL TRIALS

All entries received for initial varietal screening in the coordinated trials were examined for some important quality parameters like grain appearance score, grain protein content (on 14 % moisture basis), sedimentation value and test weight. In addition, the durum entries were also evaluated for yellow berry incidence and yellow pigments content. There were eight such multi-zone trials, the results of which are discussed below:

NIVT 1A (Irrigated, Timely Sown) – Table 1-4

Samples of 49 entries were evaluated from 5 locations (Ludhiana, Hisar, Durgapura, Delhi and Pantnagar) in NWPZ and 4 locations (Pusa, Kanpur, Varanasi and Sabour) in NEPZ.

NIVT 1B (Irrigated Timely Sown) – Table 5-8

In this trial, 49 genotypes were evaluated and samples were received from 5 centres of NWPZ (Ludhiana, Hisar, Durgapura, Pantnagar and Delhi) and 3 test sites of NEPZ (Kanpur, Varanasi and Samastipur).

NIVT 2 (Irrigated Timely Sown) – Table 9-12

Grain samples of 36 entries were evaluated from five centres (Indore, Kota, Junagarh, Powarkheda and Vijapur) in CZ and four centres (Pune, Dharwad, Ugar and Niphad) in PZ.

NIVT 3A (Irrigated Late Sown) – Table 13-17

Grain samples of 36 entries were evaluated from 5 centres in NWPZ (Pantnagar, Ludhiana, Hisar, Delhi & Durgapura) and 3 centres in NEPZ (Varanasi, Samastipur & Sabour).

NIVT 3B (Irrigated Late Sown) – Table 18-22

Grain samples of 36 entries were evaluated from 4 centres in CZ (Indore, Vijapur, Junagarh and Powarkheda) and 3 centres in PZ (Pune, Dharwad and Niphad).

NIVT 4 (Irrigated Timely Sown – T. Durum) – Table 23-28

In this trial, 36 six entries were evaluated from 5 centres (Indore, Kota, Junagarh, Powarkheda and Vijapur) in CZ and 4 centres (Pune, Dharwad, Ugar and Niphad) in PZ.

NIVT 5A (Restricted Irrigation Timely Sown) – Table 29-32

In this trial, 36 genotypes were evaluated from 5 centres of NWPZ (Ludhiana, Hisar, Durgapura, Pantnagar & Delhi), 4 centres of NEPZ (Kanpur, Varanasi, Pusa & Sabour), 4 centres in CZ (Indore, Kota, Junagarh & Vijapur) and 3 centres in PZ (Pune, Dharwad & Niphad).

NIVT 5B (Restricted Irrigation Timely Sown – *T. durum)* – Table 33-38

In this trial, 25 entries were evaluated from 2 centres (Indore and Kota) in CZ and 4 centres (Pune, Dharwad, Bagalkot and Niphad) in PZ.

IVT – Table 40-45

These trials were conducted under ITS, RTS, RES & RILS conditions of NHZ (Almora, Shimla, Malan) and RITS condition of SHZ (Wellington).

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

Sr. No	Entry	Trial Code	NWPZ							NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Varanasi	Sabour	Mean	
1	WH 1221	01	5.6	6.1	6.7	6.4	5.9	**6.1**	5.9	6.0	6.0	5.6	**5.9**	**6.0**
2	HUW 812	02	5.8	5.8	5.7	5.6	5.8	**5.7**	5.8	5.9	5.8	5.2	**5.7**	**5.7**
3	NW 7015	03	5.7	5.6	6.1	5.7	5.6	**5.7**	5.7	5.8	5.9	5.6	**5.8**	**5.7**
4	K 1603	04	5.7	6.1	5.8	5.9	5.8	**5.9**	6.0	6.1	6.0	5.6	**5.9**	**5.9**
5	HD 3253	05	5.6	5.7	5.8	6.0	5.7	**5.8**	5.9	5.9	5.8	5.2	**5.7**	**5.7**
6	DBW 223	06	6.0	5.8	5.6	5.8	5.9	**5.8**	5.7	5.9	5.8	5.2	**5.7**	**5.7**
7	HD 3251	07	6.0	6.0	5.7	5.8	5.9	**5.9**	5.8	6.2	6.5	5.2	**5.9**	**5.9**
8	DBW 228	08	5.4	5.8	5.6	5.7	6.0	**5.7**	5.7	5.8	7.0	5.1	**5.9**	**5.8**
9	K 0307(C)	09	5.1	5.9	5.8	5.5	5.8	**5.6**	6.6	5.7	5.9	5.2	**5.9**	**5.7**
10	WH 1222	10	6.1	6.2	5.6	6.0	6.2	**6.0**	5.9	5.9	6.2	5.6	**5.9**	**6.0**
11	UP 2978	11	5.8	5.7	6.9	5.6	5.8	**6.0**	5.7	5.8	6.0	5.4	**5.7**	**5.8**
12	K 1601	12	5.8	5.9	5.7	5.9	5.7	**5.8**	5.7	6.1	5.8	5.3	**5.7**	**5.8**
13	DBW 221	13	5.6	5.9	5.8	5.9	6.3	**5.9**	5.8	5.9	6.4	5.4	**5.9**	**5.9**
14	BRW 3793	14	4.5	4.9	5.9	5.1	5.4	**5.2**	5.4	5.7	5.7	5.1	**5.5**	**5.3**
15	PBW 764	15	5.6	5.9	5.8	5.5	5.8	**5.7**	6.0	6.2	6.8	5.0	**6.0**	**5.9**
16	RAJ 4493	16	5.5	5.7	5.8	5.9	5.6	**5.7**	6.8	6.6	6.2	5.7	**6.3**	**6.0**
17	WH 1220	17	5.9	7.0	6.0	5.8	6.9	**6.3**	6.2	6.5	5.9	5.3	**6.0**	**6.1**
18	RAJ 4497	18	5.4	5.7	5.8	5.8	5.5	**5.6**	5.6	5.9	5.7	4.4	**5.4**	**5.5**
19	DBW 225	19	5.2	5.5	5.7	5.7	5.9	**5.6**	5.7	5.8	5.7	4.5	**5.4**	**5.5**
20	PBW 766	20	5.3	5.6	5.2	5.1	5.5	**5.3**	5.5	5.4	5.7	4.6	**5.3**	**5.3**
21	DBW 222	21	5.4	5.7	5.6	5.1	5.6	**5.5**	5.5	5.7	5.6	4.6	**5.4**	**5.4**
22	DBW 88 (C)	22	5.2	5.7	5.9	5.3	5.6	**5.5**	5.6	5.7	5.7	5.0	**5.5**	**5.5**
23	RAJ 4496	23	5.3	5.7	6.2	5.9	5.6	**5.7**	5.7	6.3	5.9	5.1	**5.8**	**5.7**
24	PBW 762	24	5.4	5.8	6.6	5.6	5.8	**5.8**	5.8	6.1	5.8	5.1	**5.7**	**5.8**
25	HD 3250	25	5.6	5.6	5.5	5.5	5.7	**5.6**	5.6	5.8	5.8	5.2	**5.6**	**5.6**
26	RAJ 4495	26	5.5	5.7	5.3	5.7	5.7	**5.6**	5.6	5.6	5.3	4.4	**5.2**	**5.4**
27	UP 2979	27	5.4	5.0	5.7	5.6	6.0	**5.5**	5.9	5.9	5.8	5.0	**5.7**	**5.6**
28	NW 7001	28	5.8	5.5	5.6	5.5	5.6	**5.6**	5.3	5.6	5.6	4.3	**5.2**	**5.4**
29	DBW 226	29	5.5	5.8	5.8	5.8	5.7	**5.7**	5.7	5.7	5.7	5.4	**5.6**	**5.7**
30	WH 1105(C)	30	5.5	6.1	5.7	6.4	6.5	**6.0**	5.8	6.0	6.0	5.6	**5.9**	**5.9**
31	HD 3252	31	5.6	5.7	6.2	5.2	5.5	**5.6**	5.6	5.7	5.6	5.2	**5.5**	**5.6**
32	K 1602	32	5.5	5.7	5.6	5.5	5.6	**5.6**	5.5	5.7	5.6	5.1	**5.5**	**5.5**
33	PBW 763	33	5.5	5.6	5.7	5.6	5.9	**5.7**	5.8	5.7	5.6	5.2	**5.6**	**5.6**
34	HD 3248	34	5.4	5.6	5.1	5.4	5.6	**5.4**	5.4	5.8	5.5	4.4	**5.3**	**5.3**
35	HD 3249	35	5.8	6.0	5.4	5.2	5.6	**5.6**	5.4	5.8	5.7	4.8	**5.4**	**5.5**
36	DBW 227	36	5.9	6.4	6.2	6.4	6.2	**6.2**	5.8	6.6	5.9	5.7	**6.0**	**6.1**
37	UP 2977	37	5.8	5.9	6.5	5.8	5.7	**5.9**	5.8	6.2	5.7	5.1	**5.7**	**5.8**
38	JAUW 649	38	5.4	5.6	5.7	5.4	5.4	**5.5**	5.6	5.7	5.5	4.9	**5.4**	**5.5**
39	UP 2976	39	5.5	6.6	6.0	6.0	5.8	**6.0**	5.8	5.9	5.6	5.3	**5.7**	**5.8**
40	HD 3254	40	5.7	5.5	5.5	5.9	5.8	**5.7**	6.2	5.9	5.7	5.3	**5.8**	**5.7**
41	UP 2975	41	5.4	5.8	5.7	5.7	5.9	**5.7**	5.4	5.8	5.4	4.8	**5.4**	**5.5**
42	HP 1966	42	5.6	5.2	5.5	5.7	5.7	**5.5**	5.6	5.8	5.5	5.4	**5.6**	**5.6**
43	HUW 813	43	5.9	5.4	5.8	5.7	5.7	**5.7**	5.6	5.8	5.3	5.3	**5.5**	**5.6**
44	WH 1219	44	5.8	5.8	5.7	5.6	6.2	**5.8**	5.7	6.0	5.3	5.2	**5.6**	**5.7**
45	DBW 224	45	5.7	5.8	5.5	6.0	5.9	**5.8**	5.8	5.8	5.7	5.5	**5.7**	**5.7**
46	WH 1218	46	5.8	5.8	5.8	5.8	6.0	**5.8**	6.1	6.0	6.5	5.8	**6.1**	**6.0**
47	RAJ 4494	47	5.8	5.8	5.7	5.7	5.5	**5.7**	5.6	5.9	5.3	5.4	**5.6**	**5.6**
48	HD 2967(C)	48	5.6	5.2	5.5	5.4	5.6	**5.5**	5.5	5.7	5.6	5.3	**5.5**	**5.5**
49	PBW 765	49	5.4	5.4	5.4	5.5	5.3	**5.4**	5.4	5.6	5.3	5.1	**5.4**	**5.4**
Mean			**5.6**	**5.8**	**5.8**	**5.7**	**5.8**	**5.7**	**5.7**	**5.9**	**5.8**	**5.2**	**5.7**	**5.7**

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

Sr. No	Entry	Trial Code	NWPZ							NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Varanasi	Sabour	Mean	
1	WH 1221	01	76.5	80.5	79.5	79.3	79.0	**79.0**	78.5	79.5	79.0	73.3	**77.6**	**78.3**
2	HUW 812	02	78.0	78.8	74.3	77.0	78.3	**77.3**	78.5	79.0	78.0	72.8	**77.1**	**77.2**
3	NW 7015	03	78.8	79.5	79.8	79.0	79.3	**79.3**	78.3	78.8	79.5	75.8	**78.1**	**78.7**
4	K 1603	04	76.8	80.0	79.8	78.5	78.8	**78.8**	79.8	81.0	79.5	75.8	**79.0**	**78.9**
5	HD 3253	05	76.3	79.0	79.8	78.5	78.5	**78.4**	79.3	79.3	79.0	72.8	**77.6**	**78.0**
6	DBW 223	06	79.3	80.3	77.5	78.8	78.5	**78.9**	79.3	80.0	79.0	72.5	**77.7**	**78.3**
7	HD 3251	07	78.8	80.3	76.3	78.5	78.8	**78.5**	78.3	80.0	81.0	73.0	**78.1**	**78.3**
8	DBW 228	08	77.3	79.5	75.0	77.3	78.8	**77.6**	78.3	79.3	79.0	71.0	**76.9**	**77.2**
9	K 0307(C)	09	76.3	78.5	78.0	76.5	79.5	**77.8**	80.0	80.3	79.5	74.3	**78.5**	**78.1**
10	WH 1222	10	80.3	81.0	75.5	80.3	80.3	**79.5**	79.0	80.5	79.5	74.3	**78.3**	**78.9**
11	UP 2978	11	77.0	77.5	79.0	77.0	77.5	**77.6**	76.8	78.3	77.0	74.0	**76.5**	**77.1**
12	K 1601	12	78.8	78.5	76.3	78.5	78.5	**78.1**	77.5	79.8	77.5	73.5	**77.1**	**77.6**
13	DBW 221	13	79.3	81.0	78.5	79.5	80.0	**79.7**	80.3	81.3	81.5	76.3	**79.9**	**79.8**
14	BRW 3793	14	74.3	74.8	78.8	76.3	77.3	**76.3**	77.5	78.3	78.5	75.5	**77.5**	**76.9**
15	PBW 764	15	78.3	79.0	79.5	78.3	79.0	**78.8**	79.8	80.3	80.5	72.5	**78.3**	**78.5**
16	RAJ 4493	16	77.3	80.0	78.0	78.0	79.5	**78.6**	79.8	80.0	81.0	76.3	**79.3**	**78.9**
17	WH 1220	17	79.0	80.3	77.8	77.8	79.5	**78.9**	79.5	80.8	79.5	74.0	**78.5**	**78.7**
18	RAJ 4497	18	77.3	77.3	75.5	77.0	76.5	**76.7**	77.3	78.3	78.5	70.5	**76.2**	**76.4**
19	DBW 225	19	74.8	77.3	76.5	77.0	77.8	**76.7**	78.3	77.5	77.0	69.3	**75.5**	**76.1**
20	PBW 766	20	77.0	79.0	75.8	75.8	78.5	**77.2**	77.8	77.5	78.5	71.8	**76.4**	**76.8**
21	DBW 222	21	76.8	77.8	77.0	74.5	77.0	**76.6**	77.0	77.3	77.5	69.8	**75.4**	**76.0**
22	DBW 88(C)	22	75.3	78.5	79.3	76.5	78.0	**77.5**	79.0	79.5	79.0	73.0	**77.6**	**77.6**
23	RAJ 4496	23	78.3	78.3	77.8	78.3	77.5	**78.0**	78.8	80.0	79.5	73.3	**77.9**	**78.0**
24	PBW 762	24	77.8	79.0	79.3	77.3	78.0	**78.3**	78.5	79.0	79.0	72.5	**77.3**	**77.8**
25	HD 3250	25	77.5	78.0	77.5	77.0	78.3	**77.7**	78.0	79.3	78.5	71.8	**76.9**	**77.3**
26	RAJ 4495	26	77.0	79.0	74.0	77.5	78.5	**77.2**	76.8	77.8	76.0	67.8	**74.6**	**75.9**
27	UP 2979	27	76.0	75.8	78.0	78.0	78.8	**77.3**	78.8	79.8	78.5	70.8	**77.0**	**77.1**
28	NW 7001	28	77.5	77.0	76.8	76.5	77.0	**77.0**	75.5	76.8	78.0	67.0	**74.3**	**75.6**
29	DBW 226	29	77.3	78.5	77.0	78.8	76.3	**77.6**	78.5	78.5	78.0	72.5	**76.9**	**77.2**
30	WH 1105(C)	30	76.3	78.8	75.5	78.3	78.8	**77.5**	77.0	80.0	77.5	73.0	**76.9**	**77.2**
31	HD 3252	31	77.0	78.8	77.8	75.5	77.5	**77.3**	77.0	78.3	77.5	70.3	**75.8**	**76.5**
32	K 1602	32	77.5	78.8	74.5	77.8	78.0	**77.3**	76.5	77.5	78.0	71.0	**75.8**	**76.5**
33	PBW 763	33	77.5	79.0	77.5	78.3	79.0	**78.3**	79.0	77.0	77.5	73.0	**76.6**	**77.4**
34	HD 3248	34	77.8	77.5	73.5	76.0	77.8	**76.5**	76.0	78.3	77.5	69.3	**75.3**	**75.9**
35	HD 3249	35	77.8	79.3	77.3	77.8	78.3	**78.1**	78.5	79.8	78.0	71.0	**76.8**	**77.5**
36	DBW 227	36	78.3	79.0	78.3	78.3	78.5	**78.5**	77.0	80.0	77.5	74.3	**77.2**	**77.8**
37	UP 2977	37	77.8	79.8	77.5	76.8	78.3	**78.0**	77.5	79.5	78.5	69.0	**76.1**	**77.1**
38	JAUW 649	38	76.8	78.0	76.5	77.0	77.3	**77.1**	78.0	78.8	78.5	70.5	**76.5**	**76.8**
39	UP 2976	39	78.0	79.8	78.0	77.5	76.8	**78.0**	77.5	78.5	77.5	70.8	**76.1**	**77.0**
40	HD 3254	40	78.8	78.0	75.8	79.3	79.0	**78.2**	78.8	78.5	80.5	73.3	**77.8**	**78.0**
41	UP 2975	41	77.5	79.0	79.8	78.3	79.0	**78.7**	77.0	79.8	76.0	70.5	**75.8**	**77.3**
42	HP 1966	42	76.0	77.3	76.5	78.3	77.8	**77.2**	78.0	79.0	78.5	74.5	**77.5**	**77.3**
43	HUW 813	43	78.3	77.3	78.3	78.3	76.0	**77.6**	77.5	78.0	77.5	73.8	**76.7**	**77.2**
44	WH 1219	44	77.5	79.5	76.0	78.0	78.8	**78.0**	77.5	78.0	77.5	70.0	**75.8**	**76.9**
45	DBW 224	45	78.3	80.0	77.8	79.3	78.3	**78.7**	78.8	78.8	78.5	73.0	**77.3**	**78.0**
46	WH 1218	46	77.5	80.5	78.3	77.8	78.5	**78.5**	79.3	78.8	80.5	75.0	**78.4**	**78.5**
47	RAJ 4494	47	79.5	81.0	79.8	79.0	79.3	**79.7**	78.0	80.3	80.5	74.3	**78.3**	**79.0**
48	HD 2967(C)	48	79.3	74.5	77.0	76.3	77.8	**77.0**	77.3	78.8	78.0	72.8	**76.7**	**76.9**
49	PBW 765	49	73.5	76.5	74.0	74.3	75.0	**74.7**	76.0	75.8	75.0	69.0	**74.0**	**74.3**
Mean			**77.5**	**78.7**	**77.3**	**77.7**	**78.2**	**77.9**	**78.1**	**79.0**	**78.5**	**72.4**	**77.0**	**77.4**

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

Sr. No	Entry	Trial Code	NWPZ							NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Varanasi	Sabour	Mean	
1	WH 1221	01	11.17	10.87	11.83	12.76	9.37	**11.20**	11.43	9.60	9.34	12.62	**10.75**	**10.97**
2	HUW 812	02	11.43	10.71	12.34	12.47	9.22	**11.23**	10.19	8.33	7.89	11.62	**9.51**	**10.37**
3	NW 7015	03	10.65	10.83	10.45	12.17	10.00	**10.82**	10.90	10.06	9.77	11.68	**10.60**	**10.71**
4	K 1603	04	10.61	9.31	11.83	11.63	10.06	**10.69**	10.74	9.30	10.02	11.47	**10.38**	**10.54**
5	HD 3253	05	10.25	8.82	11.03	10.83	7.54	**9.69**	9.24	8.15	7.61	11.50	**9.13**	**9.41**
6	DBW 223	06	10.44	9.85	13.28	11.46	8.50	**10.71**	10.99	8.89	9.33	12.35	**10.39**	**10.55**
7	HD 3251	07	11.19	11.03	12.35	12.28	9.37	**11.24**	10.64	8.95	9.06	11.97	**10.16**	**10.70**
8	DBW 228	08	11.49	10.34	12.84	12.66	8.86	**11.24**	10.15	9.67	8.88	12.46	**10.29**	**10.76**
9	K 0307(C)	09	10.77	9.65	12.46	11.68	7.57	**10.43**	10.17	8.34	9.24	11.49	**9.81**	**10.12**
10	WH 1222	10	10.00	10.03	13.51	11.18	9.35	**10.81**	11.35	8.58	8.68	11.76	**10.09**	**10.45**
11	UP 2978	11	10.19	10.36	9.84	11.69	8.94	**10.20**	11.04	8.25	8.73	10.80	**9.71**	**9.95**
12	K 1601	12	11.31	11.23	11.06	11.97	8.74	**10.86**	11.40	9.89	9.30	12.30	**10.72**	**10.79**
13	DBW 221	13	10.89	11.06	12.30	12.30	10.41	**11.39**	11.59	9.63	8.88	11.27	**10.34**	**10.87**
14	BRW 3793	14	11.63	12.09	12.07	13.13	10.85	**11.95**	12.38	10.34	10.75	12.38	**11.46**	**11.71**
15	PBW 764	15	10.49	11.77	12.30	12.31	8.78	**11.13**	10.56	8.61	8.96	12.34	**10.12**	**10.62**
16	RAJ 4493	16	10.56	9.71	11.16	12.10	9.98	**10.70**	11.04	9.06	10.38	11.16	**10.41**	**10.56**
17	WH 1220	17	11.67	10.89	13.66	12.91	9.40	**11.71**	11.19	9.26	10.09	12.31	**10.71**	**11.21**
18	RAJ 4497	18	10.64	11.10	11.80	10.96	8.79	**10.66**	10.37	8.94	8.15	12.26	**9.93**	**10.29**
19	DBW 225	19	12.70	12.93	13.01	12.62	10.51	**12.35**	12.24	9.36	10.24	13.73	**11.39**	**11.87**
20	PBW 766	20	10.84	10.26	11.86	12.24	9.14	**10.87**	10.47	11.04	8.93	11.70	**10.54**	**10.70**
21	DBW 222	21	10.60	9.62	11.89	11.72	9.29	**10.62**	11.04	9.55	8.36	12.20	**10.29**	**10.46**
22	DBW 88(C)	22	11.44	10.18	11.32	12.94	9.67	**11.11**	11.57	8.89	9.84	11.86	**10.54**	**10.83**
23	RAJ 4496	23	10.36	11.30	11.51	11.99	11.04	**11.24**	10.98	9.05	10.28	11.77	**10.52**	**10.88**
24	PBW 762	24	10.89	10.23	12.31	12.68	7.95	**10.81**	10.09	9.51	8.63	11.95	**10.05**	**10.43**
25	HD 3250	25	10.67	9.87	10.80	12.73	9.95	**10.80**	11.09	9.60	9.08	12.68	**10.61**	**10.71**
26	RAJ 4495	26	10.54	9.18	12.72	12.29	8.81	**10.71**	11.11	9.78	9.58	12.91	**10.85**	**10.78**
27	UP 2979	27	11.21	12.34	12.60	12.27	9.76	**11.64**	11.02	8.76	10.18	12.20	**10.54**	**11.09**
28	NW 7001	28	11.00	10.57	12.27	12.46	9.65	**11.19**	11.99	9.91	8.52	13.00	**10.86**	**11.02**
29	DBW 226	29	11.40	9.59	12.56	11.81	9.57	**10.99**	11.19	9.98	10.75	12.10	**11.01**	**11.00**
30	WH 1105(C)	30	10.61	10.24	12.44	12.08	9.47	**10.97**	11.47	8.21	8.93	12.11	**10.18**	**10.57**
31	HD 3252	31	10.30	9.51	11.39	11.88	8.64	**10.34**	10.57	9.06	8.56	12.00	**10.05**	**10.20**
32	K 1602	32	11.49	9.52	12.58	12.38	10.03	**11.20**	11.30	9.79	8.57	11.96	**10.41**	**10.80**
33	PBW 763	33	11.94	11.83	13.24	12.81	9.71	**11.91**	11.30	9.05	10.17	12.20	**10.68**	**11.29**
34	HD 3248	34	11.09	10.01	11.84	12.23	8.60	**10.75**	11.58	8.60	8.69	12.75	**10.41**	**10.58**
35	HD 3249	35	11.35	9.41	12.13	13.55	8.24	**10.94**	10.37	8.26	9.69	12.17	**10.12**	**10.53**
36	DBW 227	36	11.52	11.20	11.33	13.01	10.67	**11.55**	11.37	9.37	10.59	11.17	**10.63**	**11.09**
37	UP 2977	37	11.25	9.19	11.70	11.72	8.69	**10.51**	10.77	8.62	8.97	12.51	**10.22**	**10.36**
38	JAUW 649	38	11.00	10.32	11.36	12.24	9.08	**10.80**	11.66	9.28	9.12	11.92	**10.50**	**10.65**
39	UP 2976	39	10.95	10.39	11.68	11.71	8.82	**10.71**	11.50	8.23	8.26	11.61	**9.90**	**10.31**
40	HD 3254	40	11.10	11.74	13.33	12.05	9.44	**11.53**	11.81	10.21	9.10	11.75	**10.72**	**11.12**
41	UP 2975	41	10.18	10.03	11.22	11.48	7.63	**10.11**	10.86	8.08	9.77	12.15	**10.22**	**10.16**
42	HP 1966	42	10.57	11.64	11.06	12.45	10.90	**11.32**	10.93	10.35	8.35	11.92	**10.39**	**10.86**
43	HUW 813	43	10.95	10.11	10.12	11.58	8.65	**10.28**	10.28	9.01	8.52	11.55	**9.84**	**10.06**
44	WH 1219	44	11.06	10.30	12.54	12.27	9.02	**11.04**	11.21	8.30	9.88	12.34	**10.43**	**10.74**
45	DBW 224	45	10.60	10.43	11.89	11.70	9.29	**10.78**	10.59	8.50	8.88	11.92	**9.97**	**10.38**
46	WH 1218	46	10.79	10.00	12.70	12.85	11.06	**11.48**	11.64	10.40	10.46	11.50	**11.00**	**11.24**
47	RAJ 4494	47	11.20	9.85	14.00	12.31	10.54	**11.58**	11.51	9.55	10.33	12.78	**11.04**	**11.31**
48	HD 2967(C)	48	12.25	11.03	11.83	11.47	9.25	**11.17**	12.98	9.55	9.29	11.31	**10.78**	**10.97**
49	PBW 765	49	11.34	10.12	11.95	12.29	9.13	**10.97**	11.27	8.48	8.11	12.20	**10.02**	**10.49**
Mean			**10.99**	**10.46**	**12.03**	**12.17**	**9.35**	**11.00**	**11.08**	**9.19**	**9.26**	**12.03**	**10.39**	**10.69**

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

Sr. No	Entry	Trial Code	NWPZ							NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Pusa	Kanpur	Varanasi	Sabour	Mean	
1	WH 1221	01	40	40	44	44	40	**42**	42	45	39	40	**42**	**42**
2	HUW 812	02	52	53	53	49	45	**50**	52	45	40	51	**47**	**49**
3	NW 7015	03	42	39	49	49	40	**44**	48	44	43	45	**45**	**44**
4	K 1603	04	34	35	43	38	38	**38**	38	43	35	36	**38**	**38**
5	HD 3253	05	44	40	48	48	46	**45**	48	45	40	46	**45**	**45**
6	DBW 223	06	42	36	45	41	40	**41**	47	45	39	39	**43**	**42**
7	HD 3251	07	37	35	40	45	39	**39**	44	38	34	39	**39**	**39**
8	DBW 228	08	41	38	49	43	39	**42**	44	45	40	41	**43**	**42**
9	K 0307(C)	09	35	33	42	38	36	**37**	39	44	34	36	**38**	**38**
10	WH 1222	10	44	38	48	43	42	**43**	49	42	39	44	**44**	**43**
11	UP 2978	11	46	43	48	47	44	**46**	46	43	37	41	**42**	**44**
12	K 1601	12	47	42	57	51	45	**48**	48	46	43	44	**45**	**47**
13	DBW 221	13	46	47	46	49	47	**47**	48	41	43	48	**45**	**46**
14	BRW 3793	14	38	37	40	42	36	**39**	40	35	38	40	**38**	**38**
15	PBW 764	15	41	39	41	40	39	**40**	41	48	37	40	**42**	**41**
16	RAJ 4493	16	37	37	39	45	37	**39**	39	37	37	37	**38**	**38**
17	WH 1220	17	49	46	57	52	48	**50**	49	43	45	46	**46**	**48**
18	RAJ 4497	18	41	39	48	43	35	**41**	38	44	37	39	**40**	**40**
19	DBW 225	19	50	42	49	47	43	**46**	50	44	44	47	**46**	**46**
20	PBW 766	20	48	48	49	49	45	**48**	49	45	43	46	**46**	**47**
21	DBW 222	21	44	41	44	47	42	**44**	43	48	38	48	**44**	**44**
22	DBW 88 (C)	22	46	45	49	51	48	**48**	47	45	40	44	**44**	**46**
23	RAJ 4496	23	38	39	47	50	39	**43**	42	45	39	37	**41**	**42**
24	PBW 762	24	38	40	45	48	38	**42**	43	43	37	41	**41**	**41**
25	HD 3250	25	48	48	51	53	44	**49**	50	45	44	48	**47**	**48**
26	RAJ 4495	26	37	34	50	44	38	**41**	40	49	37	39	**41**	**41**
27	UP 2979	27	48	50	51	51	48	**50**	48	48	40	43	**45**	**47**
28	NW 7001	28	46	44	46	50	43	**46**	44	44	40	43	**43**	**44**
29	DBW 226	29	39	34	47	46	36	**40**	39	41	37	37	**39**	**39**
30	WH 1105(C)	30	47	43	46	47	46	**46**	50	37	42	46	**44**	**45**
31	HD 3252	31	44	40	45	44	41	**43**	43	42	38	44	**42**	**42**
32	K 1602	32	43	36	46	38	41	**41**	46	40	39	45	**43**	**42**
33	PBW 763	33	53	46	52	45	49	**49**	51	50	44	49	**49**	**49**
34	HD 3248	34	48	39	56	48	44	**47**	51	49	39	50	**47**	**47**
35	HD 3249	35	47	45	55	50	46	**49**	49	46	41	49	**46**	**47**
36	DBW 227	36	54	41	54	50	49	**50**	49	40	40	45	**44**	**47**
37	UP 2977	37	45	36	53	45	37	**43**	44	44	35	42	**41**	**42**
38	JAUW 649	38	44	41	47	43	38	**43**	46	44	38	43	**43**	**43**
39	UP 2976	39	42	43	43	44	41	**43**	43	40	41	41	**41**	**42**
40	HD 3254	40	36	34	47	37	34	**38**	36	46	35	34	**38**	**38**
41	UP 2975	41	43	40	53	42	38	**43**	44	40	38	46	**42**	**43**
42	HP 1966	42	39	40	48	44	39	**42**	45	40	39	43	**42**	**42**
43	HUW 813	43	42	38	48	38	37	**41**	40	41	37	37	**39**	**40**
44	WH 1219	44	42	38	46	47	38	**42**	41	39	38	44	**41**	**41**
45	DBW 224	45	40	38	46	44	40	**42**	42	42	36	39	**40**	**41**
46	WH 1218	46	42	40	48	41	38	**42**	44	41	40	39	**41**	**41**
47	RAJ 4494	47	41	45	46	42	38	**42**	40	44	37	39	**40**	**41**
48	HD 2967(C)	48	47	45	53	47	43	**47**	49	44	44	46	**46**	**46**
49	PBW 765	49	46	44	53	47	38	**46**	46	41	39	44	**43**	**44**
Mean			**43**	**40**	**48**	**45**	**41**	**43**	**45**	**43**	**39**	**42**	**42**	**43**

Table 5: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT-1B

Sr. No	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Kanpur	Varanasi	Samastipur	Mean	
1	WH 1224	01	7.0	6.5	6.0	7.2	5.4	**6.4**	6.4	6.4	6.2	**6.3**	**6.4**
2	HD 3257	02	6.8	6.9	6.5	6.8	7.0	**6.8**	6.8	6.8	6.4	**6.7**	**6.7**
3	NW 7002	03	7.2	7.3	7.5	6.6	7.4	**7.2**	7.2	7.2	6.3	**6.9**	**7.1**
4	JKW 237	04	7.8	7.4	5.5	7.2	6.7	**6.9**	6.9	6.9	5.9	**6.6**	**6.7**
5	HD 3260	05	8.9	7.9	7.0	7.3	6.5	**7.5**	7.5	7.5	6.8	**7.3**	**7.4**
6	UP 2981	06	7.2	7.0	4.5	7.0	6.3	**6.4**	6.4	6.4	5.1	**6.0**	**6.2**
7	DBW 232	07	7.5	7.5	5.0	6.5	6.9	**6.7**	6.7	6.7	5.3	**6.2**	**6.5**
8	K 1607	08	6.6	7.3	6.0	5.6	7.2	**6.5**	6.5	6.5	6.2	**6.4**	**6.5**
9	WH 1105(C)	09	6.0	7.3	6.5	5.6	7.0	**6.5**	6.5	6.5	6.2	**6.4**	**6.4**
10	PBW 768	10	8.1	7.4	7.5	6.2	6.8	**7.2**	7.2	7.2	6.1	**6.8**	**7.0**
11	K 1604	11	8.2	8.1	5.5	5.7	7.3	**7.0**	7.0	7.0	5.9	**6.6**	**6.8**
12	HD 3258	12	8.1	8.3	6.0	6.4	7.4	**7.2**	7.2	7.2	6.8	**7.1**	**7.2**
13	HD 3261	13	7.5	8.0	5.5	6.3	6.9	**6.8**	6.8	6.8	6.4	**6.7**	**6.8**
14	K 1608	14	8.3	7.9	5.0	6.0	7.0	**6.8**	6.8	6.8	6.6	**6.7**	**6.8**
15	K 0307(C)	15	7.0	7.8	5.5	6.5	7.1	**6.8**	6.8	6.8	6.2	**6.6**	**6.7**
16	UP 2982	16	8.1	7.9	6.5	7.5	7.2	**7.4**	7.4	7.4	7.2	**7.3**	**7.4**
17	RAJ 4498	17	6.6	6.9	6.3	7.2	6.8	**6.8**	6.8	6.8	6.8	**6.8**	**6.8**
18	RAJ 4500	18	6.7	7.3	5.5	7.5	7.4	**6.9**	6.9	6.9	7.4	**7.1**	**7.0**
19	HUW 817	19	6.0	7.0	7.5	6.5	7.3	**6.9**	6.9	6.9	5.9	**6.6**	**6.7**
20	BRW 3796	20	7.0	7.2	5.5	7.1	7.2	**6.8**	6.8	6.8	5.3	**6.3**	**6.6**
21	HUW 815	21	7.1	7.8	6.2	7.4	7.3	**7.2**	7.2	7.2	6.2	**6.9**	**7.0**
22	DBW 229	22	5.0	6.9	6.6	6.5	6.9	**6.4**	6.4	6.4	6.8	**6.5**	**6.5**
23	DBW 233	23	6.2	7.3	7.2	6.5	7.2	**6.9**	6.9	6.9	7.1	**7.0**	**6.9**
24	NW 6098	24	6.3	7.1	7.1	5.8	6.2	**6.5**	6.5	6.5	6.3	**6.4**	**6.5**
25	PBW 767	25	6.4	7.3	7.3	6.0	6.5	**6.7**	6.7	6.7	6.9	**6.8**	**6.7**
26	NW 7004	26	5.8	7.6	8.0	6.1	7.5	**7.0**	7.0	7.0	6.9	**7.0**	**7.0**
27	WH 1223	27	5.4	7.0	6.5	5.0	6.4	**6.1**	6.1	6.1	5.9	**6.0**	**6.0**
28	K 1605	28	7.3	7.5	6.6	7.0	5.9	**6.9**	6.9	6.9	6.9	**6.9**	**6.9**
29	BRW 3799	29	7.7	7.7	7.0	6.3	7.1	**7.2**	7.2	7.2	7.3	**7.2**	**7.2**
30	HD 3255	30	7.0	8.0	8.0	6.6	7.2	**7.4**	7.4	7.4	7.1	**7.3**	**7.3**
31	DBW 230	31	6.4	7.3	7.0	7.0	7.2	**7.0**	7.0	7.0	7.1	**7.0**	**7.0**
32	HD 3262	32	7.0	7.2	6.6	8.2	7.0	**7.2**	7.2	7.2	6.7	**7.0**	**7.1**
33	HUW 816	33	6.8	6.5	7.1	6.0	6.8	**6.6**	6.6	6.6	5.9	**6.4**	**6.5**
34	DBW 234	34	7.5	8.2	6.0	7.8	5.8	**7.1**	7.1	7.1	6.4	**6.9**	**7.0**
35	DBW 88(C)	35	5.5	7.2	6.3	6.0	6.6	**6.3**	6.3	6.3	6.8	**6.5**	**6.4**
36	PBW 769	36	5.0	7.1	7.0	6.0	6.0	**6.2**	6.2	6.2	6.4	**6.3**	**6.2**
37	HUW 818	37	5.1	6.0	7.3	6.5	6.2	**6.2**	6.2	6.2	5.8	**6.1**	**6.1**
38	RAJ 4499	38	6.9	7.8	7.8	7.6	7.1	**7.4**	7.4	7.4	6.8	**7.2**	**7.3**
39	DBW 231	39	5.3	6.9	4.5	7.2	7.0	**6.2**	6.2	6.2	5.1	**5.8**	**6.0**
40	UBW 5	40	6.3	7.4	7.5	7.1	7.1	**7.1**	7.1	7.1	5.2	**6.5**	**6.8**
41	K 1606	41	6.7	7.5	6.0	7.2	6.7	**6.8**	6.8	6.8	5.5	**6.4**	**6.6**
42	HUW 814	42	7.1	7.4	5.6	8.3	7.2	**7.1**	7.1	7.1	5.8	**6.7**	**6.9**
43	UP 2980	43	7.2	7.6	5.6	6.8	6.5	**6.7**	6.7	6.7	6.2	**6.5**	**6.6**
44	HD 2967(C)	44	7.6	6.9	6.2	6.5	6.5	**6.7**	6.7	6.7	6.8	**6.7**	**6.7**
45	BRW 3792	45	7.8	7.0	7.5	7.5	7.2	**7.4**	7.4	7.4	7.0	**7.3**	**7.3**
46	NW 7000	46	7.0	7.2	6.2	7.0	6.3	**6.7**	6.7	6.7	5.1	**6.2**	**6.5**
47	HD 3256	47	7.5	7.4	7.0	7.5	7.0	**7.3**	7.3	7.3	5.8	**6.8**	**7.0**
48	NW 7003	48	7.0	7.3	6.5	7.0	7.1	**7.0**	7.0	7.0	5.2	**6.4**	**6.7**
49	HD 3259	49	7.1	7.9	7.6	7.1	7.3	**7.4**	7.4	7.4	5.4	**6.7**	**7.1**
Mean			**6.9**	**7.4**	**6.5**	**6.7**	**6.8**	**6.9**	**6.9**	**6.9**	**6.3**	**6.7**	**6.8**

Table 6: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT-1B

Sr. No	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Kanpur	Varanasi	Samastipur	Mean	
1	WH 1224	01	79.6	81.0	73.8	78.2	77.5	**78.0**	80.5	79.2	76.4	**78.7**	**78.4**
2	HD 3257	02	78.1	78.8	77.1	77.6	78.6	**78.0**	79.9	78.8	76.7	**78.5**	**78.3**
3	NW 7002	03	77.8	81.0	75.2	77.1	77.4	**77.7**	79.6	81.8	73.7	**78.4**	**78.0**
4	JKW 237	04	76.9	80.1	69.2	77.8	76.8	**76.2**	78.3	75.8	73.2	**75.8**	**76.0**
5	HD 3260	05	78.8	78.2	77.1	77.5	78.3	**78.0**	78.3	78.2	76.7	**77.7**	**77.9**
6	UP 2981	06	80.1	79.6	73.9	77.8	77.3	**77.7**	79.9	76.3	72.5	**76.2**	**77.0**
7	DBW 232	07	78.8	78.3	77.5	75.6	74.8	**77.0**	80.0	78.2	75.4	**77.9**	**77.4**
8	K 1607	08	80.5	78.8	75.1	76.5	79.9	**78.2**	81.2	80.0	77.1	**79.4**	**78.8**
9	WH 1105(C)	09	78.8	81.4	79.1	76.5	77.5	**78.7**	80.4	81.3	78.0	**79.9**	**79.3**
10	PBW 768	10	79.2	79.1	74.8	76.3	76.7	**77.2**	79.4	78.4	76.9	**78.2**	**77.7**
11	K 1604	11	79.7	81.5	77.2	78.0	77.9	**78.9**	82.4	78.4	74.7	**78.5**	**78.7**
12	HD 3258	12	79.4	78.0	75.9	78.5	76.4	**77.6**	78.6	78.3	74.2	**77.0**	**77.3**
13	HD 3261	13	79.0	80.8	73.8	76.9	79.8	**78.1**	79.4	78.5	75.8	**77.9**	**78.0**
14	K 1608	14	78.4	80.6	77.0	78.4	80.1	**78.9**	82.7	84.1	78.1	**81.6**	**80.3**
15	K 0307(C)	15	78.1	79.3	74.8	79.7	78.2	**78.0**	82.0	81.2	77.3	**80.2**	**79.1**
16	UP 2982	16	80.1	78.4	75.5	77.8	78.3	**78.0**	80.3	81.5	77.1	**79.6**	**78.8**
17	RAJ 4498	17	79.3	79.7	74.8	78.1	77.7	**77.9**	77.8	77.4	72.3	**75.8**	**76.9**
18	RAJ 4500	18	75.3	80.2	69.0	74.6	77.2	**75.3**	77.5	74.2	74.6	**75.4**	**75.3**
19	HUW 817	19	78.4	73.1	73.3	75.2	76.7	**75.3**	80.6	77.1	74.6	**77.4**	**76.4**
20	BRW 3796	20	79.2	80.7	78.9	79.0	76.3	**78.8**	80.1	79.2	76.9	**78.7**	**78.8**
21	HUW 815	21	76.7	78.1	76.2	78.5	76.6	**77.2**	79.5	78.6	74.5	**77.5**	**77.4**
22	DBW 229	22	76.7	77.5	76.0	76.6	78.7	**77.1**	78.8	79.1	77.2	**78.4**	**77.7**
23	DBW 233	23	78.4	80.3	74.9	76.5	77.0	**77.4**	78.9	75.4	75.0	**76.4**	**76.9**
24	NW 6098	24	79.5	79.3	70.7	79.5	76.5	**77.1**	81.0	79.2	73.8	**78.0**	**77.6**
25	PBW 767	25	78.9	80.8	75.9	79.1	79.8	**78.9**	81.5	78.6	76.8	**79.0**	**78.9**
26	NW 7004	26	74.7	79.5	74.7	76.9	76.9	**76.5**	80.0	79.4	75.6	**78.3**	**77.4**
27	WH 1223	27	73.4	78.7	73.4	76.2	76.2	**75.6**	78.6	79.1	75.9	**77.9**	**76.7**
28	K 1605	28	76.2	81.9	76.2	77.1	77.1	**77.7**	81.3	79.7	72.7	**77.9**	**77.8**
29	BRW 3799	29	79.7	81.0	72.7	74.2	74.2	**76.4**	81.4	79.2	77.6	**79.4**	**77.9**
30	HD 3255	30	76.7	81.7	76.7	78.9	78.9	**78.6**	81.3	81.9	77.0	**80.1**	**79.3**
31	DBW 230	31	76.9	81.1	76.9	78.0	78.0	**78.2**	78.9	78.1	77.3	**78.1**	**78.1**
32	HD 3262	32	76.3	83.0	76.3	80.3	80.3	**79.2**	81.8	81.2	76.4	**79.8**	**79.5**
33	HUW 816	33	76.9	77.8	76.9	76.5	76.5	**76.9**	79.7	81.0	73.1	**77.9**	**77.4**
34	DBW 234	34	74.7	79.9	74.7	80.0	80.0	**77.9**	80.6	79.9	76.3	**78.9**	**78.4**
35	DBW 88(C)	35	75.1	75.2	75.1	75.7	75.7	**75.4**	81.6	78.2	79.5	**79.8**	**77.6**
36	PBW 769	36	78.3	80.9	78.3	77.8	76.4	**78.3**	78.9	81.3	75.7	**78.6**	**78.5**
37	HUW 818	37	76.2	78.4	76.2	76.5	76.9	**76.8**	79.3	79.2	74.7	**77.7**	**77.3**
38	RAJ 4499	38	76.2	79.1	78.2	79.3	77.5	**78.1**	78.3	78.1	79.0	**78.5**	**78.3**
39	DBW 231	39	72.7	81.0	72.7	78.9	80.0	**77.1**	80.9	81.0	75.6	**79.2**	**78.1**
40	UBW 5	40	70.0	78.6	70.0	77.5	78.6	**74.9**	79.8	80.4	74.1	**78.1**	**76.5**
41	K 1606	41	79.0	81.4	79.0	78.7	79.2	**79.5**	81.4	82.5	77.7	**80.5**	**80.0**
42	HUW 814	42	75.3	80.2	75.3	79.5	80.0	**78.1**	80.3	77.3	75.3	**77.6**	**77.8**
43	UP 2980	43	73.4	78.6	73.4	75.5	78.0	**75.8**	79.8	79.3	75.6	**78.2**	**77.0**
44	HD 2967(C)	44	74.8	76.8	74.8	75.5	77.5	**75.9**	76.1	78.6	74.4	**76.4**	**76.1**
45	BRW 3792	45	75.3	79.2	75.3	78.9	77.8	**77.3**	79.6	74.6	77.8	**77.3**	**77.3**
46	NW 7000	46	77.9	79.6	77.9	76.7	77.4	**77.9**	81.4	74.1	75.1	**76.9**	**77.4**
47	HD 3256	47	71.4	78.9	71.4	77.5	78.4	**75.5**	81.0	76.0	77.6	**78.2**	**76.9**
48	NW 7003	48	77.2	77.6	77.2	74.0	77.5	**76.7**	78.1	79.8	74.1	**77.3**	**77.0**
49	HD 3259	49	78.0	80.6	78.0	82.5	79.6	**79.7**	80.7	78.1	77.3	**78.7**	**79.2**
Mean			**77.2**	**79.5**	**75.3**	**77.5**	**77.8**	**77.5**	**80.0**	**78.9**	**75.8**	**78.2**	**77.8**

Table 7: Protein Content (%) of *T.aestivum* genotypes in NIVT-1B

Sr. No	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Kanpur	Varanasi	Samastipur	Mean	
1	WH 1224	01	12.9	10.2	17.4	14.0	8.1	**12.5**	11.7	8.8	12.4	**11.0**	**11.7**
2	HD 3257	02	12.7	12.0	16.0	14.3	11.6	**13.3**	12.7	9.7	13.0	**11.8**	**12.6**
3	NW 7002	03	13.3	11.7	14.9	16.3	10.8	**13.4**	11.8	9.1	14.7	**11.9**	**12.6**
4	JKW 237	04	10.9	11.6	15.9	12.9	9.1	**12.1**	10.8	10.6	11.1	**10.8**	**11.5**
5	HD 3260	05	12.4	14.0	15.5	14.3	11.9	**13.6**	12.0	11.4	13.9	**12.4**	**13.0**
6	UP 2981	06	12.4	11.4	16.7	14.2	8.8	**12.7**	10.3	10.2	12.4	**11.0**	**11.8**
7	DBW 232	07	11.6	9.6	14.9	13.6	9.5	**11.8**	10.7	10.0	12.9	**11.2**	**11.5**
8	K 1607	08	11.8	10.6	16.8	14.2	10.5	**12.8**	11.3	10.0	12.1	**11.1**	**12.0**
9	WH 1105(C)	09	13.2	10.5	14.6	14.6	11.3	**12.8**	12.5	10.6	11.4	**11.5**	**12.2**
10	PBW 768	10	12.3	11.1	13.4	13.9	11.2	**12.4**	10.8	9.8	12.9	**11.2**	**11.8**
11	K 1604	11	12.7	12.6	16.4	15.0	10.3	**13.4**	12.1	10.8	13.0	**12.0**	**12.7**
12	HD 3258	12	13.1	14.6	13.8	15.0	10.1	**13.3**	12.7	11.1	13.1	**12.3**	**12.8**
13	HD 3261	13	12.8	14.8	15.1	16.2	12.6	**14.3**	12.8	10.9	14.7	**12.8**	**13.6**
14	K 1608	14	13.7	13.9	15.0	16.9	11.6	**14.2**	14.9	11.8	12.8	**13.2**	**13.7**
15	K 0307(C)	15	12.3	12.5	14.9	13.9	8.7	**12.5**	10.8	10.4	13.9	**11.7**	**12.1**
16	UP 2982	16	12.4	14.0	15.5	15.2	10.1	**13.4**	11.2	10.9	13.0	**11.7**	**12.6**
17	RAJ 4498	17	12.7	10.5	16.9	14.2	9.2	**12.7**	10.8	10.8	15.5	**12.4**	**12.5**
18	RAJ 4500	18	13.9	13.1	16.1	15.5	11.2	**14.0**	11.4	10.6	14.2	**12.1**	**13.0**
19	HUW 817	19	13.0	9.7	14.9	15.9	12.8	**13.3**	11.6	11.3	12.5	**11.8**	**12.5**
20	BRW 3796	20	11.7	10.8	16.7	13.7	10.8	**12.7**	11.4	9.5	12.0	**11.0**	**11.9**
21	HUW 815	21	11.9	11.2	16.3	14.3	10.2	**12.8**	10.7	9.5	12.1	**10.8**	**11.8**
22	DBW 229	22	12.3	12.2	15.6	14.0	9.6	**12.7**	12.2	10.1	13.2	**11.8**	**12.3**
23	DBW 233	23	11.6	9.7	14.1	14.3	10.4	**12.0**	11.3	10.4	12.2	**11.3**	**11.7**
24	NW 6098	24	12.7	12.0	13.9	13.3	10.3	**12.4**	10.1	10.3	11.6	**10.7**	**11.6**
25	PBW 767	25	12.7	11.9	16.6	14.5	10.8	**13.3**	12.0	11.2	12.6	**11.9**	**12.6**
26	NW 7004	26	12.3	12.7	14.0	13.1	8.7	**12.2**	11.2	10.0	12.4	**11.2**	**11.7**
27	WH 1223	27	12.1	9.3	16.5	14.4	9.5	**12.4**	11.6	10.2	13.3	**11.7**	**12.0**
28	K 1605	28	12.8	11.9	16.2	14.8	9.0	**12.9**	10.7	10.9	13.6	**11.7**	**12.3**
29	BRW 3799	29	14.2	10.6	16.3	14.0	9.9	**13.0**	10.7	9.4	13.0	**11.0**	**12.0**
30	HD 3255	30	12.7	11.4	16.0	14.5	10.8	**13.1**	11.5	10.0	12.7	**11.4**	**12.2**
31	DBW 230	31	12.8	10.4	16.3	14.9	9.5	**12.8**	11.5	11.1	12.3	**11.6**	**12.2**
32	HD 3262	32	13.2	13.6	16.9	14.6	10.9	**13.8**	11.1	10.7	12.4	**11.4**	**12.6**
33	HUW 816	33	12.5	11.1	14.5	15.1	9.8	**12.6**	13.2	10.5	15.1	**12.9**	**12.8**
34	DBW 234	34	13.0	14.1	15.5	14.1	11.2	**13.6**	13.1	10.9	14.0	**12.7**	**13.1**
35	DBW 88(C)	35	13.4	12.8	16.0	15.7	11.8	**13.9**	11.6	10.5	15.1	**12.4**	**13.2**
36	PBW 769	36	12.2	9.9	15.3	14.0	11.6	**12.6**	10.8	10.0	11.6	**10.8**	**11.7**
37	HUW 818	37	12.8	10.5	14.8	15.7	12.4	**13.2**	11.2	10.6	12.3	**11.4**	**12.3**
38	RAJ 4499	38	13.4	13.2	15.8	14.2	12.4	**13.8**	11.1	10.8	12.8	**11.6**	**12.7**
39	DBW 231	39	13.8	11.4	16.4	15.9	9.9	**13.5**	13.0	10.8	12.9	**12.2**	**12.9**
40	UBW 5	40	12.3	12.2	15.4	14.6	12.8	**13.5**	11.9	11.7	13.6	**12.4**	**12.9**
41	K 1606	41	14.0	10.8	16.3	14.1	10.9	**13.2**	11.0	11.1	12.6	**11.6**	**12.4**
42	HUW 814	42	11.7	10.2	15.8	13.0	9.8	**12.1**	10.7	9.9	11.7	**10.8**	**11.4**
43	UP 2980	43	13.1	12.4	15.6	15.0	11.7	**13.6**	11.2	11.1	13.5	**11.9**	**12.7**
44	HD 2967(C)	44	13.9	11.6	13.7	14.7	11.6	**13.1**	13.6	10.5	16.1	**13.4**	**13.3**
45	BRW 3792	45	12.3	12.8	13.6	13.8	11.4	**12.8**	10.7	11.5	11.8	**11.3**	**12.1**
46	NW 7000	46	11.6	12.7	14.6	13.9	9.8	**12.5**	11.4	10.7	12.9	**11.7**	**12.1**
47	HD 3256	47	13.3	11.5	15.7	14.0	10.8	**13.1**	11.3	10.7	11.9	**11.3**	**12.2**
48	NW 7003	48	12.0	12.1	16.7	14.2	9.8	**13.0**	10.9	9.7	13.6	**11.4**	**12.2**
49	HD 3259	49	13.0	11.1	16.9	14.4	10.4	**13.2**	10.2	10.5	12.0	**10.9**	**12.0**
Mean			**12.7**	**11.8**	**15.6**	**14.5**	**10.6**	**13.0**	**11.5**	**10.5**	**13.0**	**11.7**	**12.3**

Table 8: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT-1B

Sr. No	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Ludhiana	Hisar	Durgapura	Delhi	Pantnagar	Mean	Kanpur	Varanasi	Samastipur	Mean	
1	WH 1224	01	42	49	48	48	52	**48**	43	33	38	**38**	**43**
2	HD 3257	02	44	57	46	50	42	**48**	48	35	42	**42**	**45**
3	NW 7002	03	43	51	44	55	45	**48**	44	32	40	**39**	**43**
4	JKW 237	04	40	46	44	45	34	**42**	37	33	33	**34**	**38**
5	HD 3260	05	41	42	41	37	41	**40**	38	31	40	**36**	**38**
6	UP 2981	06	43	45	44	45	40	**43**	42	33	41	**39**	**41**
7	DBW 232	07	41	37	43	45	42	**42**	41	38	43	**41**	**41**
8	K 1607	08	32	30	30	35	33	**32**	33	26	32	**30**	**31**
9	WH 1105(C)	09	48	42	51	54	52	**49**	44	38	41	**41**	**45**
10	PBW 768	10	51	47	53	53	49	**51**	41	42	42	**42**	**46**
11	K 1604	11	49	47	58	52	38	**49**	48	43	50	**47**	**48**
12	HD 3258	12	42	43	45	49	43	**44**	41	40	42	**41**	**43**
13	HD 3261	13	50	51	49	54	56	**52**	48	37	47	**44**	**48**
14	K 1608	14	32	34	37	42	37	**36**	32	32	35	**33**	**35**
15	K 0307(C)	15	32	31	55	34	27	**36**	28	25	28	**27**	**31**
16	UP 2982	16	39	41	44	43	44	**42**	39	33	41	**38**	**40**
17	RAJ 4498	17	36	37	39	48	30	**38**	38	35	42	**38**	**38**
18	RAJ 4500	18	34	46	37	46	34	**39**	32	25	38	**32**	**36**
19	HUW 817	19	46	45	42	50	59	**48**	49	37	45	**44**	**46**
20	BRW 3796	20	42	40	42	46	48	**44**	42	36	42	**40**	**42**
21	HUW 815	21	41	44	48	45	43	**44**	39	33	40	**37**	**41**
22	DBW 229	22	49	49	48	50	48	**49**	45	40	45	**43**	**46**
23	DBW 233	23	44	41	42	48	46	**44**	46	39	50	**45**	**45**
24	NW 6098	24	39	38	42	38	35	**38**	33	38	38	**36**	**37**
25	PBW 767	25	43	41	44	48	44	**44**	39	41	39	**40**	**42**
26	NW 7004	26	42	42	44	43	42	**43**	44	40	40	**41**	**42**
27	WH 1223	27	49	49	45	47	38	**46**	36	39	44	**40**	**43**
28	K 1605	28	49	48	51	50	40	**48**	38	42	50	**43**	**45**
29	BRW 3799	29	56	51	52	50	36	**49**	37	56	43	**45**	**47**
30	HD 3255	30	46	44	41	42	34	**41**	28	46	38	**37**	**39**
31	DBW 230	31	48	51	44	54	33	**46**	39	48	44	**44**	**45**
32	HD 3262	32	52	45	51	40	35	**45**	37	52	40	**43**	**44**
33	HUW 816	33	51	42	39	46	47	**45**	37	51	49	**46**	**45**
34	DBW 234	34	47	45	44	43	47	**45**	38	47	36	**40**	**43**
35	DBW 88(C)	35	46	42	49	49	46	**46**	39	56	49	**48**	**47**
36	PBW 769	36	72	39	40	42	47	**48**	25	42	39	**35**	**42**
37	HUW 818	37	51	34	44	50	48	**45**	39	54	42	**45**	**45**
38	RAJ 4499	38	44	45	48	49	46	**46**	40	42	40	**41**	**44**
39	DBW 231	39	44	37	52	46	34	**43**	37	44	32	**38**	**40**
40	UBW 5	40	39	38	36	35	36	**37**	40	39	41	**40**	**38**
41	K 1606	41	34	35	36	32	37	**35**	39	34	38	**37**	**36**
42	HUW 814	42	42	40	42	41	47	**42**	39	42	37	**39**	**41**
43	UP 2980	43	49	43	42	43	48	**45**	41	49	40	**43**	**44**
44	HD 2967(C)	44	51	42	46	47	50	**47**	45	51	38	**45**	**46**
45	BRW 3792	45	50	43	44	42	41	**44**	45	50	41	**45**	**45**
46	NW 7000	46	48	48	47	42	42	**45**	42	48	38	**43**	**44**
47	HD 3256	47	49	46	42	49	47	**47**	36	49	39	**41**	**44**
48	NW 7003	48	48	46	45	44	37	**44**	33	48	34	**38**	**41**
49	HD 3259	49	45	48	47	40	38	**44**	39	49	37	**42**	**43**
Mean			**Mean**	**43**	**45**	**45**	**42**	**44**	**39**	**41**	**40**	**40**	**42**

Table 9: Grain appearance Score (Max-10) of *T.aestivum* genotypes in NIVT 2

Sr. No	Entry		CZ						PZ					Overall Mean
		Trial code	Indore	Kota	Junagarh	P'kheda	Vijapur	Mean	Pune	Dharwad	Ugar	Niphad	Mean	
1	HI 1622	01	7.0	6.7	7.1	7.0	7.0	**7.0**	6.8	6.7	6.5	6.9	**6.7**	**6.8**
2	MACS 6703	02	6.7	6.8	7.1	6.8	6.8	**6.8**	6.7	6.8	6.6	6.7	**6.7**	**6.8**
3	MP 1339	03	6.7	6.8	7.1	6.7	6.8	**6.8**	6.7	6.8	6.6	6.8	**6.7**	**6.8**
4	PBW 770	04	6.8	6.8	7.1	6.8	6.8	**6.9**	6.8	6.8	7.0	7.0	**6.9**	**6.9**
5	GW 498	05	6.9	6.9	7.3	7.0	7.1	**7.0**	7.1	7.0	6.7	7.0	**7.0**	**7.0**
6	K 1610	06	6.8	6.7	7.1	6.6	6.9	**6.8**	6.6	6.8	6.8	6.8	**6.8**	**6.8**
7	AKAW 4924	07	6.8	6.7	7.2	6.6	6.8	**6.8**	7.1	6.7	6.5	6.7	**6.8**	**6.8**
8	UAS 391	08	7.2	6.8	7.1	6.9	6.8	**7.0**	6.8	6.8	6.8	7.0	**6.9**	**6.9**
9	GW 493	09	6.7	6.7	6.9	6.7	6.9	**6.8**	6.8	6.7	6.5	6.5	**6.6**	**6.7**
10	MACS 6709	10	6.8	6.8	6.9	6.8	6.9	**6.8**	7.0	6.8	6.7	6.8	**6.8**	**6.8**
11	DBW 235	11	6.9	7.1	7.2	6.9	7.1	**7.0**	7.0	7.0	6.6	6.8	**6.9**	**6.9**
12	NIAW 3161	12	6.8	6.9	7.1	6.8	6.8	**6.9**	6.6	6.8	6.9	7.0	**6.8**	**6.9**
13	MACS 6222 (C)	13	7.1	6.8	7.1	7.2	7.0	**7.0**	7.1	7.0	7.0	7.2	**7.1**	**7.1**
14	MP 1337	14	6.9	6.7	7.0	7.0	6.8	**6.9**	6.8	6.8	6.7	6.8	**6.8**	**6.8**
15	MP 3471	15	6.7	6.8	6.9	6.8	6.8	**6.8**	6.8	6.8	6.8	7.0	**6.9**	**6.8**
16	GW 492	16	7.3	6.8	7.3	7.2	7.2	**7.2**	7.1	7.1	6.8	7.2	**7.1**	**7.1**
17	HI 1623	17	6.8	6.8	7.1	6.9	6.8	**6.9**	6.8	6.8	6.9	6.8	**6.8**	**6.9**
18	GW 495	18	7.2	6.7	7.2	7.0	7.1	**7.0**	7.0	6.9	6.9	7.0	**7.0**	**7.0**
19	UAS 389	19	6.9	6.8	6.7	6.9	6.6	**6.8**	6.7	6.8	6.7	6.7	**6.7**	**6.8**
20	WH 1234	20	6.7	6.9	7.0	6.9	6.8	**6.9**	6.7	7.0	6.6	6.7	**6.8**	**6.8**
21	JWS 152	21	6.6	6.6	7.1	6.8	6.7	**6.8**	6.7	6.8	6.7	6.7	**6.7**	**6.7**
22	NIAW 3173	22	7.2	7.0	7.2	7.2	7.1	**7.1**	7.2	7.1	7.0	7.2	**7.1**	**7.1**
23	UAS 390	23	6.8	6.8	6.9	6.9	6.9	**6.9**	6.7	6.8	6.7	6.8	**6.8**	**6.8**
24	UP 2983	24	6.8	6.8	7.1	6.8	6.9	**6.9**	6.7	6.9	6.7	6.8	**6.8**	**6.8**
25	HD 3263	25	6.7	6.7	7.1	6.8	6.8	**6.8**	6.7	6.8	6.8	6.8	**6.8**	**6.8**
26	HI 1624	26	7.1	6.8	7.3	7.1	7.2	**7.1**	7.2	6.9	7.0	7.1	**7.1**	**7.1**
27	DBW 236	27	6.9	6.7	7.0	7.1	6.8	**6.9**	7.0	6.8	6.6	7.1	**6.9**	**6.9**
28	MACS 6708	28	6.7	6.8	6.9	6.8	6.8	**6.8**	6.9	6.9	6.6	6.9	**6.8**	**6.8**
29	RAJ 4501	29	7.0	6.8	7.3	6.9	6.9	**7.0**	7.1	6.9	6.8	7.2	**7.0**	**7.0**
30	CG 1024	30	7.2	7.1	7.2	7.1	7.1	**7.1**	6.9	6.8	6.8	7.1	**6.9**	**7.0**
31	GW 491	31	6.8	6.9	7.2	7.0	7.0	**7.0**	7.1	6.8	6.9	6.9	**6.9**	**7.0**
32	HI 1625	32	7.0	6.7	7.3	6.9	7.2	**7.0**	6.9	6.8	6.7	6.9	**6.8**	**6.9**
33	UAS 388	33	6.7	6.8	6.8	6.8	6.8	**6.8**	6.8	6.7	6.5	6.7	**6.7**	**6.7**
34	MP 1338	34	7.0	6.9	7.1	6.9	6.8	**6.9**	6.9	6.9	6.7	6.9	**6.9**	**6.9**
35	HI 1544 (C)	35	7.2	6.8	7.2	7.1	7.2	**7.1**	7.1	6.9	6.9	7.3	**7.1**	**7.1**
36	RAJ 4502	36	7.1	7.0	7.2	7.0	7.2	**7.1**	7.1	6.9	6.9	6.9	**7.0**	**7.0**
	Mean		**6.9**	**6.8**	**7.1**	**6.9**	**6.9**	**6.9**	**6.9**	**6.9**	**6.7**	**6.9**	**6.8**	**6.9**

Table 10: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT 2

Sr. No	Entry		CZ						PZ					Overall Mean
		Trial Code	Indore	Kota	Junagarh	P'kheda	Vijapur	Mean	Pune	Dharwad	Ugar	Niphad	Mean	
1	HI 1622	01	79.5	79.3	80.8	80.4	79.4	**79.9**	76.6	79.1	79.3	80.4	**78.9**	**79.4**
2	MACS 6703	02	79.7	79.4	79.4	79.3	77.4	**79.0**	74.5	78.6	79.5	79.9	**78.1**	**78.6**
3	MP 1339	03	78.6	79.0	79.6	78.6	77.8	**78.7**	74.5	78.0	79.5	79.2	**77.8**	**78.3**
4	PBW 770	04	80.0	79.9	80.0	80.4	78.9	**79.8**	77.5	78.5	79.8	80.7	**79.1**	**79.5**
5	GW 498	05	79.5	81.0	80.8	81.7	80.4	**80.7**	79.7	79.8	81.4	82.1	**80.8**	**80.7**
6	K 1610	06	78.0	77.5	79.4	77.0	78.5	**78.1**	73.2	77.6	79.6	78.6	**77.3**	**77.7**
7	AKAW 4924	07	80.2	80.0	80.9	82.4	80.1	**80.7**	79.2	79.7	79.3	80.6	**79.7**	**80.2**
8	UAS 391	08	82.5	82.0	81.3	82.4	78.0	**81.2**	79.1	80.3	81.3	83.0	**80.9**	**81.1**
9	GW 493	09	79.7	80.7	79.9	79.9	81.0	**80.2**	76.8	79.2	78.8	80.3	**78.8**	**79.5**
10	MACS 6709	10	79.8	79.7	79.6	80.6	76.9	**79.3**	77.7	79.1	79.6	79.8	**79.1**	**79.2**
11	DBW 235	11	80.7	80.3	81.2	81.2	79.0	**80.5**	77.4	79.8	79.6	81.2	**79.5**	**80.0**
12	NIAW 3161	12	79.6	80.1	79.6	79.7	76.4	**79.1**	72.1	77.4	80.1	80.3	**77.5**	**78.3**
13	MACS 6222 (C)	13	80.9	81.1	80.6	82.0	78.5	**80.6**	78.9	80.2	81.5	81.8	**80.6**	**80.6**
14	MP 1337	14	79.7	79.2	79.7	80.3	77.2	**79.2**	74.5	77.5	79.0	79.8	**77.7**	**78.5**
15	MP 3471	15	79.0	80.3	79.5	79.6	78.3	**79.3**	76.2	78.1	79.7	80.2	**78.6**	**78.9**
16	GW 492	16	80.9	81.3	80.7	82.7	81.2	**81.4**	80.1	81.1	81.9	82.4	**81.4**	**81.4**
17	HI 1623	17	79.8	80.2	80.5	81.0	77.2	**79.7**	75.2	78.8	78.2	79.2	**77.9**	**78.8**
18	GW 495	18	81.2	80.7	80.3	82.0	79.5	**80.7**	78.3	79.1	80.9	81.6	**80.0**	**80.4**
19	UAS 389	19	79.0	79.5	73.0	79.8	71.5	**76.6**	72.5	74.8	79.1	78.7	**76.3**	**76.4**
20	WH 1234	20	79.9	80.0	78.3	79.9	75.2	**78.7**	72.1	77.9	78.5	79.4	**77.0**	**77.8**
21	JWS 152	21	76.1	76.1	78.1	78.2	74.5	**76.6**	74.0	78.0	78.1	76.7	**76.7**	**76.7**
22	NIAW 3173	22	81.6	81.1	80.8	82.9	79.5	**81.2**	79.3	80.5	81.5	82.4	**80.9**	**81.1**
23	UAS 390	23	79.1	78.7	77.6	77.9	74.8	**77.6**	72.4	77.2	78.5	78.3	**76.6**	**77.1**
24	UP 2983	24	79.8	80.3	79.0	79.9	77.7	**79.3**	74.3	77.9	79.7	80.2	**78.0**	**78.7**
25	HD 3263	25	77.7	77.7	80.0	78.9	77.7	**78.4**	73.2	77.0	78.2	77.9	**76.6**	**77.5**
26	HI 1624	26	80.7	80.7	80.9	82.1	81.9	**81.3**	80.3	79.4	81.7	81.9	**80.8**	**81.0**
27	DBW 236	27	80.8	79.5	80.3	81.9	76.6	**79.8**	78.9	79.0	78.9	81.1	**79.5**	**79.6**
28	MACS 6708	28	78.3	77.2	78.1	78.4	75.9	**77.6**	71.8	76.1	77.6	78.6	**76.0**	**76.8**
29	RAJ 4501	29	79.6	80.1	79.8	80.5	77.0	**79.4**	76.1	78.8	80.5	81.1	**79.1**	**79.3**
30	CG 1024	30	81.7	81.0	79.8	81.4	79.4	**80.7**	75.9	76.4	81.2	81.8	**78.8**	**79.7**
31	GW 491	31	80.7	81.2	80.9	82.1	79.3	**80.8**	79.5	79.4	80.9	81.2	**80.3**	**80.5**
32	HI 1625	32	80.7	81.3	81.5	81.9	80.9	**81.3**	80.2	79.3	80.7	81.3	**80.4**	**80.8**
33	UAS 388	33	80.3	80.0	78.9	79.8	76.5	**79.1**	75.8	77.8	79.1	80.1	**78.2**	**78.7**
34	MP 1338	34	80.1	79.8	79.9	77.2	77.2	**78.8**	76.2	78.3	78.9	80.9	**78.6**	**78.7**
35	HI 1544 (C)	35	81.2	80.1	80.4	80.6	79.8	**80.4**	79.4	78.6	81.0	82.1	**80.3**	**80.3**
36	RAJ 4502	36	80.0	80.1	80.3	81.4	79.8	**80.3**	77.0	79.0	80.1	80.2	**79.1**	**79.7**
	Mean		**79.9**	**79.9**	**79.8**	**80.4**	**78.1**	**79.6**	**76.4**	**78.5**	**79.8**	**80.4**	**78.8**	**79.2**

Table 11: Protein Content (%) of *T.aestivum* genotypes in NIVT 2

Sr. No	Entry		CZ						PZ					Overall Mean
		Trial Code	Indore	Kota	Junagarh	P'kheda	Vijapur	Mean	Pune	Dharwad	Ugar	Niphad	Mean	
1	HI 1622	01	13.4	13.4	14.3	13.8	13.6	**13.7**	14.0	13.1	10.8	13.4	**12.8**	**13.3**
2	MACS 6703	02	12.1	14.1	14.9	13.5	14.4	**13.8**	14.8	13.4	10.9	11.5	**12.7**	**13.2**
3	MP 1339	03	12.3	12.7	14.1	12.6	13.7	**13.1**	14.1	13.1	10.7	12.0	**12.5**	**12.8**
4	PBW 770	04	11.8	13.0	14.5	13.5	13.4	**13.2**	14.3	14.0	12.6	12.1	**13.3**	**13.2**
5	GW 498	05	11.2	14.1	14.5	13.5	13.6	**13.4**	13.5	14.1	11.6	12.2	**12.9**	**13.1**
6	K 1610	06	13.0	14.1	14.4	13.9	14.0	**13.9**	14.0	13.9	10.4	12.7	**12.8**	**13.3**
7	AKAW 4924	07	14.8	13.9	15.1	12.0	14.5	**14.1**	14..4	14.7	12.3	13.4	**13.7**	**13.9**
8	UAS 391	08	13.9	13.1	14.9	13.6	15.4	**14.2**	15.0	13.5	10.5	13.5	**13.1**	**13.7**
9	GW 493	09	11.8	12.4	13.9	13.6	12.7	**12.9**	13.8	12.2	10.9	11.5	**12.1**	**12.5**
10	MACS 6709	10	12.9	13.0	15.3	13.1	15.5	**14.0**	14.8	13.1	11.7	12.4	**13.0**	**13.5**
11	DBW 235	11	12.3	14.3	14.7	13.3	14.3	**13.8**	14.7	13.5	10.9	11.9	**12.8**	**13.3**
12	NIAW 3161	12	12.6	13.0	14.7	13.2	14.6	**13.6**	14.1	14.6	11.3	11.7	**12.9**	**13.3**
13	MACS 6222 (C)	13	13.5	13.2	15.9	12.2	14.8	**13.9**	14.4	13.6	10.7	11.6	**12.6**	**13.2**
14	MP 1337	14	12.2	13.4	15.2	12.8	14.5	**13.6**	14.3	14.0	11.9	11.2	**12.9**	**13.2**
15	MP 3471	15	13.6	13.4	14.8	13.1	14.9	**14.0**	14.8	14.1	11.7	12.1	**13.2**	**13.6**
16	GW 492	16	11.6	13.1	14.1	12.9	13.8	**13.1**	13.8	13.2	12.0	12.7	**12.9**	**13.0**
17	HI 1623	17	12.2	12.7	14.2	12.9	13.2	**13.0**	14.3	13.3	11.2	13.2	**13.0**	**13.0**
18	GW 495	18	11.0	13.1	13.7	12.3	12.8	**12.6**	12.6	12.9	10.7	11.3	**11.9**	**12.2**
19	UAS 389	19	12.8	12.3	15.5	12.3	15.3	**13.6**	13.9	14.0	11.3	11.7	**12.7**	**13.2**
20	WH 1234	20	11.8	13.2	14.5	12.4	14.3	**13.2**	13.8	13.7	10.7	11.2	**12.4**	**12.8**
21	JWS 152	21	12.2	13.5	15.3	13.6	14.8	**13.9**	14.6	13.6	10.9	13.9	**13.3**	**13.6**
22	NIAW 3173	22	13.6	13.9	16.5	12.9	14.8	**14.3**	14.8	13.6	11.4	11.8	**12.9**	**13.6**
23	UAS 390	23	11.7	13.0	14.3	12.3	14.8	**13.2**	14.2	12.9	10.8	11.3	**12.3**	**12.8**
24	UP 2983	24	12.6	12.8	15.7	13.4	14.9	**13.9**	15.2	14.7	11.9	12.4	**13.6**	**13.7**
25	HD 3263	25	12.8	13.6	15.3	12.3	14.8	**13.8**	14.7	13.2	11.3	13.4	**13.2**	**13.5**
26	HI 1624	26	10.9	12.5	14.8	12.8	13.4	**12.9**	12.9	13.1	12.0	12.6	**12.7**	**12.8**
27	DBW 236	27	14.1	13.7	15.9	13.9	15.2	**14.6**	14.2	14.1	10.6	13.0	**13.0**	**13.8**
28	MACS 6708	28	12.0	13.4	14.5	12.8	13.8	**13.3**	14.3	14.6	10.6	11.7	**12.8**	**13.1**
29	RAJ 4501	29	13.1	14.1	15.8	14.4	14.7	**14.4**	14.7	14.3	11.4	12.1	**13.1**	**13.8**
30	CG 1024	30	12.2	13.8	15.4	13.7	14.8	**14.0**	15.2	14.0	11.7	12.6	**13.4**	**13.7**
31	GW 491	31	11.7	13.5	14.5	12.6	14.2	**13.3**	13.4	13.7	11.1	12.7	**12.7**	**13.0**
32	HI 1625	32	11.6	12.8	15.3	12.9	15.1	**13.5**	14.1	14.9	12.3	12.6	**13.5**	**13.5**
33	UAS 388	33	11.9	13.2	14.5	12.9	14.4	**13.4**	14.3	13.7	11.3	12.6	**13.0**	**13.2**
34	MP 1338	34	11.6	12.6	14.8	13.7	13.0	**13.1**	13.6	12.7	10.8	11.1	**12.1**	**12.6**
35	HI 1544 (C)	35	10.7	13.2	14.3	12.6	13.4	**12.8**	13.1	13.6	11.2	12.1	**12.5**	**12.7**
36	RAJ 4502	36	13.7	13.7	15.3	13.3	13.8	**14.0**	14.1	14.1	12.9	13.4	**13.6**	**13.8**
	Mean		**12.4**	**13.3**	**14.9**	**13.1**	**14.3**	**13.6**	**14.2**	**13.7**	**11.3**	**12.3**	**12.9**	**13.2**

Table 12: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT 2

Sr. No	Entry	Trial Code	CZ						PZ					Overall Mean
			Indore	Kota	Junagarh	P'kheda	Vijapur	Mean	Pune	Dharwad	Ugar	Niphad	Mean	
1	HI 1622	01	48	45	49	48	56	**49**	49	47	37	47	**45**	**47**
2	MACS 6703	02	41	46	51	45	60	**49**	48	45	36	38	**42**	**45**
3	MP 1339	03	43	41	47	43	58	**46**	46	45	35	41	**42**	**44**
4	PBW 770	04	37	40	47	44	56	**45**	46	46	39	38	**42**	**44**
5	GW 498	05	36	46	46	46	58	**46**	44	46	38	40	**42**	**44**
6	K 1610	06	44	46	49	48	60	**49**	45	48	35	43	**43**	**46**
7	AKAW 4924	07	52	46	50	38	61	**49**	48	50	38	43	**45**	**47**
8	UAS 391	08	49	44	53	48	62	**51**	53	47	37	48	**46**	**49**
9	GW 493	09	38	43	45	47	52	**45**	47	39	32	36	**39**	**42**
10	MACS 6709	10	44	45	53	44	62	**50**	51	45	41	44	**45**	**47**
11	DBW 235	11	40	46	49	45	61	**48**	49	45	35	40	**42**	**45**
12	NIAW 3161	12	42	42	51	45	62	**48**	48	51	38	38	**44**	**46**
13	MACS 6222 (C)	13	44	41	55	39	62	**48**	46	42	32	35	**39**	**43**
14	MP 1337	14	42	44	54	44	61	**49**	48	49	38	38	**43**	**46**
15	MP 3471	15	48	44	50	49	62	**51**	51	49	40	46	**47**	**49**
16	GW 492	16	37	43	46	41	58	**45**	46	44	39	39	**42**	**44**
17	HI 1623	17	39	40	46	41	55	**44**	47	42	34	42	**41**	**43**
18	GW 495	18	35	41	43	40	55	**43**	40	42	33	36	**38**	**40**
19	UAS 389	19	44	41	54	40	62	**48**	46	49	37	38	**43**	**45**
20	WH 1234	20	39	42	49	40	60	**46**	46	47	36	37	**42**	**44**
21	JWS 152	21	39	44	52	46	61	**48**	48	45	33	45	**43**	**46**
22	NIAW 3173	22	46	48	57	44	62	**51**	50	47	41	41	**45**	**48**
23	UAS 390	23	38	43	48	41	61	**46**	47	43	36	37	**41**	**43**
24	UP 2983	24	42	41	53	45	62	**49**	52	48	40	41	**45**	**47**
25	HD 3263	25	45	46	51	40	60	**48**	51	47	40	46	**46**	**47**
26	HI 1624	26	34	39	48	42	53	**43**	40	40	34	38	**38**	**41**
27	DBW 236	27	50	47	54	49	62	**52**	50	50	40	47	**47**	**50**
28	MACS 6708	28	39	43	49	42	59	**46**	47	50	34	37	**42**	**44**
29	RAJ 4501	29	42	46	52	49	60	**50**	48	46	37	38	**42**	**46**
30	CG 1024	30	40	47	53	48	62	**50**	52	48	38	41	**45**	**47**
31	GW 491	31	36	42	48	42	60	**46**	43	45	35	40	**41**	**43**
32	HI 1625	32	41	41	53	44	62	**48**	46	50	41	42	**45**	**46**
33	UAS 388	33	41	42	50	44	60	**47**	49	48	36	43	**44**	**46**
34	MP 1338	34	42	44	52	48	55	**48**	49	48	39	41	**44**	**46**
35	HI 1544 (C)	35	34	42	47	41	56	**44**	42	43	34	38	**39**	**42**
36	RAJ 4502	36	45	44	52	43	58	**48**	46	47	40	44	**44**	**46**
	Mean		**42**	**43**	**50**	**44**	**59**	**48**	**47**	**46**	**37**	**41**	**43**	**45**

Table 13: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT 3A

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Varanasi	Samastipur	Sabour	Mean	
1	JKW 234	01	5.5	5.0	5.5	5.0	6.0	**5.4**	6.0	5.0	4.5	**5.2**	**5.3**
2	DBW 238	02	6.0	5.5	6.0	7.0	6.5	**6.2**	6.0	5.0	5.0	**5.3**	**5.8**
3	BRW 3791	03	6.0	6.5	6.5	6.0	7.0	**6.4**	5.5	4.5	4.5	**4.8**	**5.6**
4	HI 1563 (C)	04	6.0	6.5	5.5	7.0	6.0	**6.2**	6.5	5.5	4.5	**5.5**	**5.9**
5	DBW 240	05	5.0	5.0	5.0	5.0	6.5	**5.3**	5.5	5.0	4.5	**5.0**	**5.2**
6	K 1614	06	5.5	6.0	5.5	7.0	7.5	**6.3**	6.5	5.5	4.5	**5.5**	**5.9**
7	PBW 773	07	6.0	6.0	6.0	6.5	7.5	**6.4**	6.0	5.5	5.0	**5.5**	**6.0**
8	K 1612	08	5.5	7.0	6.5	8.0	6.5	**6.7**	7.5	5.5	5.5	**6.2**	**6.4**
9	UP 2984	09	5.0	5.5	5.0	6.0	6.0	**5.5**	6.0	4.5	4.0	**4.8**	**5.2**
10	UBW 14	10	5.5	5.5	5.5	5.0	5.5	**5.4**	5.5	4.0	4.0	**4.5**	**5.0**
11	HUW 821	11	4.5	5.5	4.0	5.5	6.5	**5.2**	5.0	5.0	4.0	**4.7**	**4.9**
12	WH 1226	12	5.5	6.5	6.0	6.5	6.0	**6.1**	7.0	5.0	4.0	**5.3**	**5.7**
13	NW 7010	13	6.0	7.0	7.0	7.0	7.0	**6.8**	6.5	5.0	5.0	**5.5**	**6.2**
14	K 1613	14	6.0	5.0	5.5	5.5	6.5	**5.7**	6.0	5.0	5.0	**5.3**	**5.5**
15	PBW 772	15	5.0	5.5	5.0	6.0	5.0	**5.3**	5.5	4.5	4.5	**4.8**	**5.1**
16	HD 3269	16	5.0	5.5	5.0	5.5	6.0	**5.4**	5.5	4.5	4.5	**4.8**	**5.1**
17	DBW 14(C)	17	6.0	6.5	6.0	6.5	7.0	**6.4**	6.0	5.5	5.0	**5.5**	**6.0**
18	DBW 90(C)	18	6.5	6.0	6.0	7.0	6.5	**6.4**	6.0	5.0	4.5	**5.2**	**5.8**
19	RAJ 4503	19	5.5	5.5	5.5	6.0	5.5	**5.6**	5.5	5.0	4.5	**5.0**	**5.3**
20	RAJ 4504	20	6.0	5.0	5.5	5.5	6.5	**5.7**	5.0	4.0	4.0	**4.3**	**5.0**
21	DBW 237	21	5.0	5.5	5.5	6.5	6.5	**5.8**	6.0	5.5	5.0	**5.5**	**5.7**
22	HD 3267	22	5.5	5.5	5.0	5.5	6.0	**5.5**	6.0	5.0	5.5	**5.5**	**5.5**
23	HD 3266	23	5.5	4.5	5.0	6.0	5.5	**5.3**	5.5	5.0	4.0	**4.8**	**5.1**
24	HD 3268	24	6.0	6.0	6.0	6.0	6.5	**6.1**	5.0	5.5	5.0	**5.2**	**5.6**
25	HD 3265	25	5.0	6.0	6.0	6.0	7.0	**6.0**	6.0	5.0	5.5	**5.5**	**5.8**
26	HD 3059(C)	26	5.5	6.0	6.0	7.0	6.5	**6.2**	6.0	5.5	5.0	**5.5**	**5.9**
27	WH 1228	27	6.0	5.5	6.5	7.0	6.5	**6.3**	6.5	5.0	5.0	**5.5**	**5.9**
28	PBW 771	28	5.5	6.5	6.5	7.0	7.0	**6.5**	6.0	5.0	5.0	**5.3**	**5.9**
29	HUW 819	29	6.5	6.0	6.5	8.0	7.5	**6.9**	6.5	5.5	6.0	**6.0**	**6.5**
30	UP 2985	30	5.5	5.5	5.5	6.5	6.5	**5.9**	6.0	5.0	5.0	**5.3**	**5.6**
31	WH 1227	31	6.5	6.0	5.5	7.0	6.0	**6.2**	6.0	4.5	5.0	**5.2**	**5.7**
32	HUW 820	32	5.5	5.5	5.0	4.5	6.0	**5.3**	6.0	4.5	4.5	**5.0**	**5.2**
33	HD 3264	33	6.0	6.0	6.0	7.0	6.5	**6.3**	5.5	5.0	5.5	**5.3**	**5.8**
34	DBW 239	34	6.0	6.5	6.0	7.0	6.0	**6.3**	6.0	4.5	5.0	**5.2**	**5.7**
35	UP 2987	35	7.0	5.5	5.0	6.5	6.0	**6.0**	5.5	5.0	4.5	**5.0**	**5.5**
36	NW 7007	36	6.0	6.0	5.5	6.0	7.0	**6.1**	6.0	5.0	4.5	**5.2**	**5.6**
Mean			**5.7**	**5.8**	**5.7**	**6.3**	**6.4**	**6.0**	**5.9**	**5.0**	**4.8**	**5.2**	**5.6**

Table 14: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT 3A

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Varanasi	Samastipur	Sabour	Mean	
1	JKW 234	01	71.6	79.4	75.6	77.1	75.3	**75.8**	77.5	79.9	75.0	**77.5**	**76.6**
2	DBW 238	02	77.8	78.4	78.1	82.6	78.7	**79.1**	81.4	78.2	73.7	**77.8**	**78.4**
3	BRW 3791	03	70.1	79.3	74.8	80.0	74.8	**75.8**	79.2	71.9	78.3	**76.5**	**76.1**
4	HI 1563 (C)	04	77.7	84.0	70.9	83.1	80.8	**79.3**	81.8	76.6	74.7	**77.7**	**78.5**
5	DBW 240	05	71.9	77.7	74.3	81.8	75.6	**76.3**	77.2	71.3	79.2	**75.9**	**76.1**
6	K 1614	06	77.8	81.1	74.8	79.8	76.8	**78.1**	81.5	70.2	70.5	**74.1**	**76.1**
7	PBW 773	07	76.1	81.2	78.9	80.1	79.8	**79.2**	80.1	76.2	72.2	**76.2**	**77.7**
8	K 1612	08	75.3	81.1	79.0	79.6	78.2	**78.6**	80.9	71.3	67.9	**73.4**	**76.0**
9	UP 2984	09	73.7	78.5	73.3	75.8	74.0	**75.1**	77.0	78.3	66.7	**74.0**	**74.5**
10	UBW 14	10	73.9	77.3	74.5	74.2	74.6	**74.9**	76.5	77.5	63.3	**72.4**	**73.7**
11	HUW 821	11	73.2	77.3	72.1	75.8	76.1	**74.9**	75.4	78.6	63.5	**72.5**	**73.7**
12	WH 1226	12	70.6	73.2	68.8	73.9	70.5	**71.4**	76.1	63.4	64.9	**68.1**	**69.8**
13	NW 7010	13	76.7	82.2	79.1	80.3	80.8	**79.8**	81.9	77.8	71.8	**77.2**	**78.5**
14	K 1613	14	75.7	79.1	76.7	75.9	78.8	**77.2**	80.3	80.0	70.7	**77.0**	**77.1**
15	PBW 772	15	75.5	73.4	71.0	73.9	71.3	**73.0**	69.0	72.0	63.9	**68.3**	**70.7**
16	HD 3269	16	63.1	78.4	76.5	78.7	78.5	**75.0**	81.0	79.6	69.9	**76.8**	**75.9**
17	DBW 14(C)	17	74.2	81.4	74.8	77.0	78.2	**77.1**	78.2	72.3	69.1	**73.2**	**75.2**
18	DBW 90(C)	18	74.9	77.0	76.2	77.2	72.3	**75.5**	76.5	69.8	67.8	**71.4**	**73.4**
19	RAJ 4503	19	70.1	78.8	75.3	73.3	73.6	**74.2**	75.4	76.7	65.2	**72.4**	**73.3**
20	RAJ 4504	20	74.1	77.1	74.0	75.2	76.2	**75.3**	75.0	63.5	61.6	**66.7**	**71.0**
21	DBW 237	21	74.6	80.6	75.8	78.1	78.1	**77.4**	79.1	71.2	66.8	**72.4**	**74.9**
22	HD 3267	22	75.9	79.5	75.3	79.2	74.5	**76.9**	80.1	78.5	82.4	**80.3**	**78.6**
23	HD 3266	23	74.4	79.8	74.5	77.3	75.9	**76.4**	80.3	69.7	66.6	**72.2**	**74.3**
24	HD 3268	24	74.8	79.0	75.5	74.0	76.3	**75.9**	62.8	70.1	70.8	**67.9**	**71.9**
25	HD 3265	25	70.1	79.4	75.5	77.3	77.3	**75.9**	77.6	71.5	71.1	**73.4**	**74.7**
26	HD 3059(C)	26	75.8	80.6	77.6	75.2	76.8	**77.2**	79.9	70.8	71.7	**74.1**	**75.7**
27	WH 1228	27	76.8	81.8	78.7	80.4	78.6	**79.3**	78.5	73.4	71.7	**74.5**	**76.9**
28	PBW 771	28	74.0	81.1	77.6	78.0	77.1	**77.6**	79.5	73.1	71.7	**74.8**	**76.2**
29	HUW 819	29	75.2	81.1	72.9	80.0	76.2	**77.1**	80.3	74.7	73.6	**76.2**	**76.6**
30	UP 2985	30	76.8	80.6	77.3	79.9	76.9	**78.3**	79.5	71.3	68.3	**73.0**	**75.7**
31	WH 1227	31	73.7	79.7	74.7	77.0	76.0	**76.2**	74.8	66.7	69.2	**70.2**	**73.2**
32	HUW 820	32	72.5	77.1	70.1	73.2	71.8	**72.9**	76.9	68.1	69.9	**71.6**	**72.3**
33	HD 3264	33	75.6	78.0	77.3	78.5	77.3	**77.3**	79.1	70.1	72.0	**73.7**	**75.5**
34	DBW 239	34	74.5	77.0	74.9	77.4	74.9	**75.7**	77.8	69.3	79.6	**75.6**	**75.7**
35	UP 2987	35	76.9	72.3	73.8	77.6	75.2	**75.2**	78.7	71.1	79.1	**76.3**	**75.7**
36	NW 7007	36	73.9	80.1	69.6	75.3	78.1	**75.4**	78.4	70.5	64.9	**71.3**	**73.3**
Mean			**74.1**	**79.0**	**75.0**	**77.6**	**76.3**	**76.4**	**77.9**	**72.9**	**70.5**	**73.8**	**75.1**

Table 15: Protein Content (%) of *T.aestivum* genotypes in NIVT 3A

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Varanasi	Samastipur	Sabour	Mean	
1	JKW 234	01	11.6	10.3	10.4	12.0	12.9	**11.4**	10.9	13.6	12.4	**12.3**	**11.9**
2	DBW 238	02	10.0	9.6	10.3	11.5	12.3	**10.7**	10.3	13.8	10.9	**11.7**	**11.2**
3	BRW 3791	03	11.9	9.8	11.7	12.5	12.3	**11.6**	11.2	13.1	12.4	**12.2**	**11.9**
4	HI 1563 (C)	04	9.7	10.0	9.9	10.7	11.8	**10.4**	10.6	12.4	11.6	**11.5**	**11.0**
5	DBW 240	05	9.1	9.5	10.1	12.0	13.0	**10.7**	10.8	14.0	12.1	**12.3**	**11.5**
6	K 1614	06	11.3	10.3	10.9	13.2	13.4	**11.8**	11.4	14.6	12.4	**12.8**	**12.3**
7	PBW 773	07	10.4	8.7	9.7	11.1	11.7	**10.3**	9.9	13.0	11.7	**11.5**	**10.9**
8	K 1612	08	10.1	11.7	11.2	13.7	13.1	**12.0**	11.6	14.9	13.8	**13.4**	**12.7**
9	UP 2984	09	10.3	9.9	9.4	13.2	14.3	**11.4**	11.9	13.9	12.3	**12.7**	**12.1**
10	UBW 14	10	10.2	10.9	10.5	12.6	14.0	**11.6**	11.4	13.8	12.7	**12.6**	**12.1**
11	HUW 821	11	9.9	9.9	10.0	12.1	12.8	**10.9**	11.8	13.4	12.5	**12.6**	**11.8**
12	WH 1226	12	10.5	10.9	10.7	12.6	12.8	**11.5**	11.3	14.1	12.2	**12.5**	**12.0**
13	NW 7010	13	11.4	10.7	11.2	13.7	12.9	**12.0**	12.2	14.3	12.6	**13.0**	**12.5**
14	K 1613	14	10.9	9.6	9.9	12.8	12.4	**11.1**	11.4	13.7	11.7	**12.3**	**11.7**
15	PBW 772	15	9.9	11.2	10.7	12.7	13.5	**11.6**	11.0	14.0	13.6	**12.9**	**12.2**
16	HD 3269	16	10.6	10.1	10.9	12.6	12.8	**11.4**	11.9	14.1	13.1	**13.0**	**12.2**
17	DBW 14(C)	17	10.5	9.6	11.2	11.9	12.0	**11.0**	11.1	13.9	12.4	**12.5**	**11.8**
18	DBW 90(C)	18	10.8	10.3	9.9	11.9	13.7	**11.3**	10.8	13.5	12.6	**12.3**	**11.8**
19	RAJ 4503	19	9.8	10.6	11.4	13.3	13.0	**11.6**	12.6	14.0	12.6	**13.1**	**12.3**
20	RAJ 4504	20	12.1	10.4	10.4	12.6	12.4	**11.6**	11.8	15.2	13.4	**13.5**	**12.5**
21	DBW 237	21	9.0	9.5	11.3	12.9	13.1	**11.2**	11.5	13.4	12.3	**12.4**	**11.8**
22	HD 3267	22	10.7	10.2	10.3	11.5	13.6	**11.3**	11.0	12.6	11.6	**11.7**	**11.5**
23	HD 3266	23	9.9	10.1	10.4	13.3	13.3	**11.4**	9.5	13.5	11.8	**11.6**	**11.5**
24	HD 3268	24	10.4	9.7	10.8	13.4	12.8	**11.4**	11.2	13.3	11.6	**12.0**	**11.7**
25	HD 3265	25	10.9	9.9	10.4	12.5	12.8	**11.3**	10.7	13.2	12.4	**12.1**	**11.7**
26	HD 3059(C)	26	10.5	10.1	10.4	13.1	12.8	**11.4**	11.0	13.8	11.1	**12.0**	**11.7**
27	WH 1228	27	11.2	9.3	10.2	12.5	11.6	**11.0**	10.5	13.0	10.5	**11.3**	**11.1**
28	PBW 771	28	9.7	9.9	10.2	11.0	12.4	**10.6**	11.1	12.8	11.6	**11.8**	**11.2**
29	HUW 819	29	10.7	10.9	11.4	13.3	12.3	**11.7**	12.2	13.4	12.4	**12.7**	**12.2**
30	UP 2985	30	9.5	10.5	10.6	11.7	12.9	**11.0**	11.3	12.7	12.2	**12.1**	**11.6**
31	WH 1227	31	10.4	9.4	10.7	12.6	12.5	**11.1**	11.2	14.2	11.8	**12.4**	**11.8**
32	HUW 820	32	10.4	10.9	10.0	12.9	13.2	**11.5**	10.8	13.7	11.2	**11.9**	**11.7**
33	HD 3264	33	10.2	9.9	9.6	12.2	12.6	**10.9**	11.6	13.7	11.4	**12.2**	**11.6**
34	DBW 239	34	11.7	11.3	11.0	13.0	14.0	**12.2**	12.1	13.5	12.5	**12.7**	**12.5**
35	UP 2987	35	11.4	10.1	11.4	12.4	12.7	**11.6**	11.7	14.5	11.4	**12.5**	**12.1**
36	NW 7007	36	9.4	9.8	10.6	12.6	11.9	**10.9**	10.0	12.4	11.9	**11.4**	**11.1**
Mean			**10.5**	**10.2**	**10.6**	**12.5**	**12.8**	**11.3**	**11.2**	**13.6**	**12.1**	**12.3**	**11.8**

Table 16: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT 3A

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Varanasi	Samastipur	Sabour	Mean	
1	JKW 234	01	65	32	55	45	37	**47**	40	68	65	**58**	**52**
2	DBW 238	02	39	27	62	43	34	**41**	42	46	60	**49**	**45**
3	BRW 3791	03	41	30	35	46	31	**37**	44	54	53	**50**	**43**
4	HI 1563 (C)	04	40	26	57	34	30	**37**	36	42	53	**44**	**41**
5	DBW 240	05	46	22	48	34	33	**37**	32	67	48	**49**	**43**
6	K 1614	06	59	26	55	48	31	**44**	36	39	55	**43**	**44**
7	PBW 773	07	60	37	60	40	36	**47**	35	68	60	**54**	**50**
8	K 1612	08	30	45	46	46	37	**41**	36	46	72	**51**	**46**
9	UP 2984	09	44	46	54	61	35	**48**	42	41	65	**49**	**49**
10	UBW 14	10	44	48	62	63	33	**50**	47	51	75	**58**	**54**
11	HUW 821	11	39	38	55	52	41	**45**	46	73	70	**63**	**54**
12	WH 1226	12	36	40	54	51	39	**44**	39	53	76	**56**	**50**
13	NW 7010	13	50	40	69	46	36	**48**	40	49	70	**53**	**51**
14	K 1613	14	32	28	45	44	31	**36**	34	53	70	**52**	**44**
15	PBW 772	15	34	40	57	48	40	**44**	30	54	66	**50**	**47**
16	HD 3269	16	28	28	43	30	30	**32**	20	33	56	**36**	**34**
17	DBW 14(C)	17	50	30	49	35	30	**39**	21	35	57	**38**	**38**
18	DBW 90(C)	18	60	34	62	49	26	**46**	35	46	66	**49**	**48**
19	RAJ 4503	19	44	32	44	42	24	**37**	26	34	55	**38**	**38**
20	RAJ 4504	20	52	25	36	42	26	**36**	28	65	54	**49**	**43**
21	DBW 237	21	57	35	48	66	28	**47**	34	76	70	**60**	**53**
22	HD 3267	22	63	40	74	51	35	**53**	35	73	56	**55**	**54**
23	HD 3266	23	52	30	51	49	29	**42**	24	37	57	**39**	**41**
24	HD 3268	24	40	24	41	41	24	**34**	24	39	50	**38**	**36**
25	HD 3265	25	42	22	33	30	23	**30**	21	36	50	**36**	**33**
26	HD 3059(C)	26	66	35	55	61	30	**49**	38	76	65	**60**	**55**
27	WH 1228	27	65	34	45	45	27	**43**	29	75	50	**51**	**47**
28	PBW 771	28	54	23	40	25	24	**33**	26	62	42	**43**	**38**
29	HUW 819	29	58	30	62	35	26	**42**	34	38	57	**43**	**43**
30	UP 2985	30	55	34	53	40	27	**42**	32	47	51	**43**	**43**
31	WH 1227	31	60	38	51	52	29	**46**	40	51	62	**51**	**49**
32	HUW 820	32	62	36	64	51	48	**52**	34	43	62	**46**	**49**
33	HD 3264	33	66	39	65	40	36	**49**	47	41	58	**49**	**49**
34	DBW 239	34	65	43	71	53	29	**52**	41	39	70	**50**	**51**
35	UP 2987	35	72	36	70	60	32	**54**	46	75	58	**60**	**57**
36	NW 7007	36	47	34	56	49	28	**43**	31	56	67	**51**	**47**
Mean			**50**	**34**	**54**	**46**	**32**	**43**	**35**	**52**	**60**	**49**	**46**

Table 17: Phenol Test (Max. Score 10) of *T.aestivum* genotypes in NIVT 3A

Sr. No.	Entry	Trial Code	NWPZ						NEPZ				Overall Mean
			Pantnagar	Ludhiana	Hisar	Delhi	Durgapura	Mean	Varanasi	Samastipur	Sabour	Mean	
1	JKW 234	01	6	7	6	7	7	**6.6**	6	5	6	**5.7**	**6.1**
2	DBW 238	02	7	7	8	5	5	**6.4**	7	7	7	**7.0**	**6.7**
3	BRW 3791	03	5	6	5	3	3	**4.4**	5	4	6	**5.0**	**4.7**
4	HI 1563 (C)	04	4	3	7	4	7	**5.0**	4	3	4	**3.7**	**4.3**
5	DBW 240	05	5	7	6	4	3	**5.0**	6	5	7	**6.0**	**5.5**
6	K 1614	06	4	4	8	4	7	**5.4**	5	4	3	**4.0**	**4.7**
7	PBW 773	07	6	5	8	5	6	**6.0**	5	6	8	**6.3**	**6.2**
8	K 1612	08	6	7	4	4	7	**5.6**	7	7	6	**6.7**	**6.1**
9	UP 2984	09	7	6	6	7	5	**6.2**	5	8	7	**6.7**	**6.4**
10	UBW 14	10	6	6	7	6	8	**6.6**	6	8	7	**7.0**	**6.8**
11	HUW 821	11	8	8	8	7	8	**7.8**	8	8	7	**7.7**	**7.7**
12	WH 1226	12	7	6	8	6	7	**6.8**	8	8	8	**8.0**	**7.4**
13	NW 7010	13	4	5	5	3	3	**4.0**	3	5	5	**4.3**	**4.2**
14	K 1613	14	6	7	8	7	7	**7.0**	5	8	7	**6.7**	**6.8**
15	PBW 772	15	7	7	8	7	7	**7.2**	8	8	8	**8.0**	**7.6**
16	HD 3269	16	5	7	7	7	7	**6.6**	5	6	8	**6.3**	**6.5**
17	DBW 14(C)	17	5	6	8	7	6	**6.4**	7	5	8	**6.7**	**6.5**
18	DBW 90(C)	18	4	8	8	6	6	**6.4**	7	7	7	**7.0**	**6.7**
19	RAJ 4503	19	5	7	6	5	6	**5.8**	7	8	6	**7.0**	**6.4**
20	RAJ 4504	20	7	6	5	5	7	**6.0**	6	5	7	**6.0**	**6.0**
21	DBW 237	21	8	5	6	5	6	**6.0**	7	6	8	**7.0**	**6.5**
22	HD 3267	22	6	7	7	5	6	**6.2**	8	5	7	**6.7**	**6.4**
23	HD 3266	23	7	7	6	5	7	**6.4**	8	7	7	**7.3**	**6.9**
24	HD 3268	24	7	6	7	5	7	**6.4**	6	6	8	**6.7**	**6.5**
25	HD 3265	25	7	6	7	5	6	**6.2**	6	7	6	**6.3**	**6.3**
26	HD 3059(C)	26	8	7	6	6	7	**6.8**	7	8	7	**7.3**	**7.1**
27	WH 1228	27	6	6	8	6	7	**6.6**	6	7	5	**6.0**	**6.3**
28	PBW 771	28	8	5	8	5	5	**6.2**	7	7	6	**6.7**	**6.4**
29	HUW 819	29	3	4	4	2	4	**3.4**	4	5	5	**4.7**	**4.0**
30	UP 2985	30	6	6	7	5	6	**6.0**	8	7	7	**7.3**	**6.7**
31	WH 1227	31	8	5	8	5	8	**6.8**	8	6	7	**7.0**	**6.9**
32	HUW 820	32	7	6	8	6	7	**6.8**	7	7	6	**6.7**	**6.7**
33	HD 3264	33	7	5	7	7	7	**6.6**	7	6	7	**6.7**	**6.6**
34	DBW 239	34	7	8	8	7	7	**7.4**	8	6	8	**7.3**	**7.4**
35	UP 2987	35	8	6	7	6	8	**7.0**	6	7	8	**7.0**	**7.0**
36	NW 7007	36	7	6	8	8	6	**7.0**	5	7	7	**6.3**	**6.7**
Mean			**6.2**	**6.1**	**6.9**	**5.5**	**6.3**	**6.2**	**6.3**	**6.4**	**6.7**	**6.5**	**6.3**

Table 18: Grain appearance score (Max-10) of *T.aestivum* genotypes in NIVT 3B

Sr. No.	Entry	Trial Code	CZ					PZ				Overall Mean
			Indore	Vijapur	Junagarh	Powarkheda	Zonal Mean	Pune	Dharwad	Niphad	Zonal Mean	
1	DBW 243	01	8.0	7.0	6.0	7.0	**7.0**	6.0	6.5	7.5	**6.7**	**6.8**
2	RAJ 4083(C)	02	8.0	7.5	5.5	8.0	**7.3**	5.0	7.0	8.0	**6.7**	**7.0**
3	HI 1627	03	8.5	8.0	6.5	8.0	**7.8**	7.0	7.0	8.0	**7.3**	**7.5**
4	WH 1230	04	8.0	7.0	6.0	6.0	**6.8**	5.5	6.5	8.0	**6.7**	**6.7**
5	AKAW 5017	05	7.5	6.0	6.5	6.0	**6.5**	5.0	7.0	7.0	**6.3**	**6.4**
6	MP 1340	06	7.5	7.5	5.0	7.0	**6.8**	6.0	7.0	7.0	**6.7**	**6.7**
7	RAJ 4238(C)	07	8.5	7.5	6.5	8.5	**7.8**	7.5	7.0	8.0	**7.5**	**7.6**
8	WH 1229	08	7.5	5.5	4.0	7.5	**6.1**	6.0	7.5	7.0	**6.8**	**6.5**
9	HD 2864(C)	09	8.0	6.5	6.0	7.0	**6.9**	6.5	6.5	7.5	**6.8**	**6.9**
10	GW 500	10	8.5	7.0	7.0	7.5	**7.5**	7.0	6.5	7.0	**6.8**	**7.2**
11	LOK 73	11	8.0	6.0	5.5	7.5	**6.8**	5.5	7.5	7.0	**6.7**	**6.7**
12	NIAW 3033	12	7.5	6.5	6.0	8.0	**7.0**	5.0	6.5	7.0	**6.2**	**6.6**
13	MP 1342	13	7.0	8.0	5.0	8.5	**7.1**	6.0	7.0	8.0	**7.0**	**7.1**
14	MACS 6715	14	6.5	7.5	5.5	6.0	**6.4**	6.0	8.0	7.0	**7.0**	**6.7**
15	HI 1626	15	7.5	6.0	4.5	8.5	**6.6**	6.5	7.0	6.0	**6.5**	**6.6**
16	GW 501	16	8.5	8.5	7.0	8.0	**8.0**	7.0	6.5	8.5	**7.3**	**7.7**
17	UAS 393	17	6.5	6.0	4.5	6.0	**5.8**	6.5	7.5	6.0	**6.7**	**6.2**
18	NIAW 3212	18	8.0	6.5	5.5	6.5	**6.6**	6.5	6.0	7.0	**6.5**	**6.6**
19	MP 3469	19	8.5	7.5	5.5	8.0	**7.4**	6.0	7.0	7.5	**6.8**	**7.1**
20	HI 8794	20	8.0	6.5	4.5	8.0	**6.8**	7.5	7.5	8.5	**7.8**	**7.3**
21	UAS 392	21	7.0	7.5	5.0	7.5	**6.8**	6.0	6.5	7.0	**6.5**	**6.6**
22	CG 1025	22	8.0	7.0	6.5	8.0	**7.4**	6.0	6.5	8.0	**6.8**	**7.1**
23	HD 3270	23	8.0	7.0	5.5	7.0	**6.9**	7.0	7.5	6.5	**7.0**	**6.9**
24	LOK 74	24	8.5	7.5	6.5	7.5	**7.5**	7.5	7.0	8.0	**7.5**	**7.5**
25	NIAW 3074	25	8.0	7.5	5.5	7.0	**7.0**	5.5	7.0	7.5	**6.7**	**6.8**
26	CG 1026	26	8.5	8.0	7.0	8.5	**8.0**	6.0	7.5	8.5	**7.3**	**7.7**
27	DBW 241	27	8.0	7.0	6.0	7.0	**7.0**	6.0	7.5	6.0	**6.5**	**6.8**
28	PBW 774	28	7.0	7.5	6.0	8.0	**7.1**	6.0	6.5	7.0	**6.5**	**6.8**
29	MP 3470	29	8.0	6.5	5.0	7.0	**6.6**	6.0	6.0	7.5	**6.5**	**6.6**
30	GW 499	30	7.5	8.5	7.0	8.5	**7.9**	6.5	8.0	8.0	**7.5**	**7.7**
31	DBW 242	31	7.5	8.0	5.0	6.0	**6.6**	5.0	7.0	7.0	**6.3**	**6.5**
32	GW 504	32	8.5	8.0	7.0	8.0	**7.9**	7.0	7.5	8.0	**7.5**	**7.7**
33	MP 1341	33	7.0	6.0	5.5	8.5	**6.8**	6.5	8.0	7.5	**7.3**	**7.0**
34	HD 2932(C)	34	8.0	7.0	6.5	7.5	**7.3**	7.0	7.0	8.0	**7.3**	**7.3**
35	MACS 6714	35	8.5	8.5	7.0	7.5	**7.9**	7.0	7.5	8.0	**7.5**	**7.7**
36	GW 502	36	6.0	7.5	5.5	6.0	**6.3**	6.0	6.5	6.5	**6.3**	**6.3**
Mean			**7.8**	**7.2**	**5.8**	**7.4**	**7.0**	**6.3**	**7.0**	**7.4**	**6.9**	**7.0**

Table 19: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT 3B

Sr. No.	Entry	Trial Code	CZ					PZ				Overall Mean
			Indore	Vijapur	Junagarh	Powarkheda	Zonal Mean	Pune	Dharwad	Niphad	Zonal Mean	
1	DBW 243	01	83.5	75.8	77.9	80.9	**79.5**	78.2	79.1	81.0	**79.4**	**79.5**
2	RAJ 4083(C)	02	84.0	80.6	77.6	81.4	**80.9**	74.0	79.6	82.8	**78.8**	**79.9**
3	HI 1627	03	85.2	80.0	80.3	85.6	**82.8**	78.1	76.1	84.1	**79.4**	**81.1**
4	WH 1230	04	80.6	78.8	73.7	79.4	**78.1**	73.9	78.0	81.0	**77.6**	**77.9**
5	AKAW 5017	05	82.2	75.8	76.7	80.0	**78.7**	60.5	78.3	80.6	**73.1**	**75.9**
6	MP 1340	06	81.6	78.2	71.0	79.8	**77.7**	76.1	77.9	78.6	**77.5**	**77.6**
7	RAJ 4238(C)	07	85.0	80.1	76.6	85.5	**81.8**	77.3	77.6	80.6	**78.5**	**80.2**
8	WH 1229	08	83.9	76.1	71.3	81.5	**78.2**	79.8	77.9	82.5	**80.1**	**79.1**
9	HD 2864(C)	09	85.4	82.2	82.6	85.9	**84.0**	79.7	77.5	84.8	**80.7**	**82.3**
10	GW 500	10	83.1	81.3	81.6	84.3	**82.6**	68.8	78.4	83.4	**76.9**	**79.7**
11	LOK 73	11	82.2	73.9	69.3	80.6	**76.5**	61.7	79.0	80.5	**73.7**	**75.1**
12	NIAW 3033	12	82.1	77.4	76.3	82.3	**79.5**	71.1	77.2	80.8	**76.4**	**77.9**
13	MP 1342	13	84.0	79.0	74.9	83.5	**80.4**	77.8	77.2	82.3	**79.1**	**79.7**
14	MACS 6715	14	84.0	80.7	79.0	81.0	**81.2**	79.6	77.8	83.2	**80.2**	**80.7**
15	HI 1626	15	84.0	75.3	71.6	83.3	**78.6**	76.5	79.5	82.5	**79.5**	**79.0**
16	GW 501	16	85.2	80.2	78.7	84.6	**82.2**	76.7	78.6	83.2	**79.5**	**80.8**
17	UAS 393	17	75.9	73.9	69.3	80.1	**74.8**	76.5	76.6	78.5	**77.2**	**76.0**
18	NIAW 3212	18	76.8	75.2	75.7	80.0	**76.9**	76.2	75.9	82.8	**78.3**	**77.6**
19	MP 3469	19	76.9	76.9	75.8	83.8	**78.4**	77.4	78.7	83.4	**79.8**	**79.1**
20	HI 8794	20	84.6	71.0	71.0	85.5	**78.0**	79.0	75.6	84.0	**79.5**	**78.8**
21	UAS 392	21	80.6	78.4	75.1	81.5	**78.9**	79.1	78.8	82.7	**80.2**	**79.6**
22	CG 1025	22	82.4	80.6	76.4	80.6	**80.0**	73.2	74.8	82.7	**76.9**	**78.5**
23	HD 3270	23	84.0	75.5	77.3	82.1	**79.7**	77.3	79.3	80.1	**78.9**	**79.3**
24	LOK 74	24	81.8	78.2	73.2	80.5	**78.4**	75.9	77.7	80.1	**77.9**	**78.2**
25	NIAW 3074	25	84.4	80.3	76.7	81.9	**80.8**	74.9	79.0	82.5	**78.8**	**79.8**
26	CG 1026	26	85.0	76.2	78.9	85.2	**81.3**	77.1	79.4	83.8	**80.1**	**80.7**
27	DBW 241	27	83.1	77.1	74.8	81.1	**79.0**	77.0	79.6	80.7	**79.1**	**79.1**
28	PBW 774	28	84.2	75.3	76.2	83.4	**79.8**	76.0	79.0	83.0	**79.3**	**79.6**
29	MP 3470	29	82.0	81.9	72.5	82.2	**79.7**	75.4	77.3	82.8	**78.5**	**79.1**
30	GW 499	30	80.6	80.0	79.1	83.5	**80.8**	75.9	77.3	82.3	**78.5**	**79.7**
31	DBW 242	31	83.7	79.8	72.0	79.6	**78.8**	71.4	78.1	81.1	**76.9**	**77.8**
32	GW 504	32	84.1	75.9	78.8	84.9	**80.9**	78.9	78.7	82.4	**80.0**	**80.5**
33	MP 1341	33	83.8	79.8	75.8	81.3	**80.2**	73.5	78.6	81.2	**77.8**	**79.0**
34	HD 2932(C)	34	84.3	79.8	77.5	83.7	**81.3**	76.3	77.8	82.2	**78.8**	**80.0**
35	MACS 6714	35	84.3	81.3	79.4	84.7	**82.4**	78.4	78.3	82.4	**79.7**	**81.1**
36	GW 502	36	74.6	79.3	78.0	80.0	**78.0**	67.9	78.9	81.7	**76.2**	**77.1**
Mean			**82.6**	**78.1**	**75.9**	**82.4**	**79.7**	**75.2**	**78.0**	**82.0**	**78.4**	**79.1**

Table 20: Protein Content (%) of *T.aestivum* genotypes in NIVT 3B

Sr. No.	Entry	Trial Code	CZ					PZ				Overall Mean
			Indore	Vijapur	Junagarh	Powarkheda	Zonal Mean	Pune	Dharwad	Niphad	Zonal Mean	
1	DBW 243	01	10.3	14.2	15.6	12.2	**13.1**	13.7	13.5	11.8	**13.0**	**13.0**
2	RAJ 4083(C)	02	10.2	12.1	14.4	12.2	**12.2**	13.7	13.3	11.8	**12.9**	**12.6**
3	HI 1627	03	11.4	14.4	14.3	12.9	**13.3**	14.8	13.9	12.7	**13.8**	**13.5**
4	WH 1230	04	10.0	14.1	15.8	12.2	**13.0**	14.5	13.8	13.1	**13.8**	**13.4**
5	AKAW 5017	05	10.0	14.0	14.6	13.3	**13.0**	15.1	12.8	13.4	**13.8**	**13.4**
6	MP 1340	06	9.7	14.5	16.4	12.1	**13.2**	14.2	14.7	12.5	**13.8**	**13.5**
7	RAJ 4238(C)	07	10.1	12.6	13.6	11.9	**12.1**	13.4	14.6	11.7	**13.2**	**12.6**
8	WH 1229	08	10.9	11.6	13.5	11.1	**11.8**	12.7	13.1	11.4	**12.4**	**12.1**
9	HD 2864(C)	09	11.3	12.4	13.1	11.6	**12.1**	13.5	13.5	12.1	**13.0**	**12.6**
10	GW 500	10	10.7	12.9	13.6	12.1	**12.3**	13.2	14.3	12.5	**13.3**	**12.8**
11	LOK 73	11	10.3	12.8	14.1	11.0	**12.1**	13.7	13.8	12.0	**13.2**	**12.6**
12	NIAW 3033	12	11.2	13.5	14.0	12.3	**12.8**	14.3	13.9	12.8	**13.7**	**13.2**
13	MP 1342	13	11.5	13.2	15.4	12.9	**13.3**	14.1	14.1	12.6	**13.6**	**13.4**
14	MACS 6715	14	13.2	14.5	16.1	13.5	**14.3**	14.8	13.9	13.7	**14.1**	**14.2**
15	HI 1626	15	9.6	11.3	13.8	12.0	**11.7**	13.2	13.4	13.0	**13.2**	**12.4**
16	GW 501	16	12.1	13.4	14.7	13.4	**13.4**	13.8	13.1	12.5	**13.1**	**13.3**
17	UAS 393	17	9.7	13.1	14.0	11.2	**12.0**	13.1	13.6	10.8	**12.5**	**12.3**
18	NIAW 3212	18	10.1	12.6	14.5	12.0	**12.3**	13.0	13.1	11.3	**12.5**	**12.4**
19	MP 3469	19	11.2	12.8	13.9	12.5	**12.6**	14.1	13.7	12.2	**13.3**	**13.0**
20	HI 8794	20	9.2	12.9	14.7	10.9	**11.9**	14.2	13.6	11.0	**12.9**	**12.4**
21	UAS 392	21	10.7	12.6	15.5	11.5	**12.6**	12.8	13.7	10.5	**12.3**	**12.5**
22	CG 1025	22	10.2	12.3	14.0	11.6	**12.0**	13.1	13.7	12.1	**13.0**	**12.5**
23	HD 3270	23	10.4	13.0	15.1	12.0	**12.6**	13.7	12.9	12.5	**13.0**	**12.8**
24	LOK 74	24	10.3	12.5	13.2	12.0	**12.0**	12.5	13.6	12.3	**12.8**	**12.4**
25	NIAW 3074	25	10.9	12.6	14.3	11.8	**12.4**	13.9	13.7	12.2	**13.3**	**12.8**
26	CG 1026	26	11.2	12.6	13.2	11.9	**12.2**	13.8	13.8	12.4	**13.3**	**12.8**
27	DBW 241	27	11.5	14.3	16.4	12.0	**13.6**	14.3	14.0	11.3	**13.2**	**13.4**
28	PBW 774	28	10.8	13.8	15.0	13.3	**13.2**	14.7	13.3	13.5	**13.8**	**13.5**
29	MP 3470	29	10.7	13.2	14.8	12.5	**12.8**	15.7	15.1	13.5	**14.8**	**13.8**
30	GW 499	30	10.9	12.8	13.4	11.8	**12.2**	14.3	13.9	12.0	**13.4**	**12.8**
31	DBW 242	31	10.6	13.5	15.7	12.2	**13.0**	16.5	12.6	11.2	**13.4**	**13.2**
32	GW 504	32	11.2	12.6	14.0	12.2	**12.5**	13.1	12.3	12.4	**12.6**	**12.6**
33	MP 1341	33	9.10	12.9	15.4	10.7	**12.0**	14.2	13.1	11.1	**12.8**	**12.4**
34	HD 2932(C)	34	10.5	13.3	14.6	12.2	**12.7**	13.6	13.1	12.5	**13.1**	**12.9**
35	MACS 6714	35	11.5	13.9	14.8	12.4	**13.2**	14.6	14.2	13.2	**14.0**	**13.6**
36	GW 502	36	12.4	14.6	13.6	13.7	**13.6**	14.3	13.6	14.6	**14.2**	**13.9**
Mean			**10.7**	**13.2**	**14.5**	**12.1**	**12.6**	**14.0**	**13.6**	**12.3**	**13.3**	**13.0**

Table 21: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT 3B

Sr. No.	Entry	Trial Code	CZ					PZ				Overall Mean
			Indore	Vijapur	Junagarh	Powarkheda	Zonal Mean	Pune	Dharwad	Niphad	Zonal Mean	
1	DBW 243	01	34	36	40	35	**36**	34	29	27	**30**	**33**
2	RAJ 4083(C)	02	34	42	42	40	**40**	40	22	29	**30**	**35**
3	HI 1627	03	32	33	34	35	**34**	33	33	27	**31**	**32**
4	WH 1230	04	38	37	44	35	**39**	46	29	33	**36**	**37**
5	AKAW 5017	05	36	37	44	40	**39**	39	31	35	**35**	**37**
6	MP 1340	06	32	35	49	37	**38**	43	31	30	**35**	**36**
7	RAJ 4238(C)	07	31	35	51	35	**38**	43	33	27	**34**	**36**
8	WH 1229	08	34	46	38	37	**39**	44	30	30	**35**	**37**
9	HD 2864(C)	09	26	33	36	30	**31**	43	29	24	**32**	**32**
10	GW 500	10	37	43	21	30	**33**	43	30	24	**32**	**33**
11	LOK 73	11	32	36	46	42	**39**	42	28	30	**33**	**36**
12	NIAW 3033	12	36	40	43	40	**40**	42	30	32	**35**	**37**
13	MP 1342	13	32	38	42	40	**38**	40	37	30	**36**	**37**
14	MACS 6715	14	29	34	30	24	**29**	35	36	25	**32**	**31**
15	HI 1626	15	32	40	40	36	**37**	36	31	31	**33**	**35**
16	GW 501	16	35	44	39	38	**39**	41	30	34	**35**	**37**
17	UAS 393	17	24	45	38	35	**36**	39	32	33	**35**	**35**
18	NIAW 3212	18	25	39	42	29	**34**	40	33	30	**34**	**34**
19	MP 3469	19	25	37	36	32	**33**	42	20	34	**32**	**32**
20	HI 8794	20	20	32	28	26	**27**	26	33	23	**27**	**27**
21	UAS 392	21	28	29	34	35	**32**	31	42	33	**35**	**33**
22	CG 1025	22	25	32	33	26	**29**	39	34	30	**34**	**32**
23	HD 3270	23	28	35	46	43	**38**	39	25	36	**33**	**36**
24	LOK 74	24	40	44	46	35	**41**	33	28	31	**31**	**36**
25	NIAW 3074	25	35	49	44	37	**41**	43	20	34	**32**	**37**
26	CG 1026	26	26	53	30	26	**34**	33	32	20	**28**	**31**
27	DBW 241	27	22	33	26	34	**29**	27	30	24	**27**	**28**
28	PBW 774	28	30	49	52	42	**43**	40	30	40	**37**	**40**
29	MP 3470	29	32	42	49	42	**41**	40	35	39	**38**	**40**
30	GW 499	30	28	28	28	25	**27**	25	37	25	**29**	**28**
31	DBW 242	31	40	50	38	44	**43**	47	29	34	**37**	**40**
32	GW 504	32	25	29	24	24	**26**	25	30	23	**26**	**26**
33	MP 1341	33	32	40	43	30	**36**	35	33	31	**33**	**35**
34	HD 2932(C)	34	35	36	35	28	**34**	32	32	32	**32**	**33**
35	MACS 6714	35	25	36	33	28	**31**	29	29	28	**29**	**30**
36	GW 502	36	28	43	38	36	**36**	33	36	35	**35**	**35**
Mean			**31**	**39**	**38**	**34**	**36**	**37**	**31**	**30**	**33**	**34**

Table 22: Phenol Test (Max. Score-10) of *T.aestivum* genotypes in NIVT 3B

Sr. No.	Entry	Trial Code	CZ					PZ				Overall Mean
			Indore	Vijapur	Junagarh	Powarkheda	Zonal Mean	Pune	Dharwad	Niphad	Zonal Mean	
1	DBW 243	01	7	5	7	7	**6.5**	6	7	5	**6.0**	**6.3**
2	RAJ 4083(C)	02	5	6	7	8	**6.5**	5	6	8	**6.3**	**6.4**
3	HI 1627	03	4	5	6	7	**5.5**	6	7	8	**7.0**	**6.3**
4	WH 1230	04	8	5	8	6	**6.8**	7	8	6	**7.0**	**6.9**
5	AKAW 5017	05	6	4	7	5	**5.5**	7	6	6	**6.3**	**5.9**
6	MP 1340	06	7	7	8	5	**6.8**	5	8	6	**6.3**	**6.5**
7	RAJ 4238(C)	07	1	2	3	1	**1.8**	2	4	3	**3.0**	**2.4**
8	WH 1229	08	6	5	4	3	**4.5**	6	7	7	**6.7**	**5.6**
9	HD 2864(C)	09	2	3	3	2	**2.5**	3	5	3	**3.7**	**3.1**
10	GW 500	10	3	3	4	2	**3.0**	3	5	4	**4.0**	**3.5**
11	LOK 73	11	5	4	5	4	**4.5**	5	3	5	**4.3**	**4.4**
12	NIAW 3033	12	4	6	6	6	**5.5**	4	6	6	**5.3**	**5.4**
13	MP 1342	13	4	7	7	6	**6.0**	5	8	7	**6.7**	**6.3**
14	MACS 6715	14	8	7	7	5	**6.8**	6	6	4	**5.3**	**6.0**
15	HI 1626	15	7	8	6	6	**6.8**	7	6	7	**6.7**	**6.7**
16	GW 501	16	8	7	7	7	**7.3**	6	7	5	**6.0**	**6.6**
17	UAS 393	17	7	8	6	6	**6.8**	6	8	5	**6.3**	**6.5**
18	NIAW 3212	18	7	7	7	7	**7.0**	5	8	7	**6.7**	**6.8**
19	MP 3469	19	4	6	5	4	**4.8**	5	6	4	**5.0**	**4.9**
20	HI 8794	20	0	0	0	0	**0.0**	0	0	0	**0.0**	**0.0**
21	UAS 392	21	7	6	6	6	**6.3**	6	7	4	**5.7**	**6.0**
22	CG 1025	22	7	8	7	5	**6.8**	5	7	7	**6.3**	**6.5**
23	HD 3270	23	6	8	7	8	**7.3**	7	5	7	**6.3**	**6.8**
24	LOK 74	24	7	7	6	4	**6.0**	6	6	5	**5.7**	**5.8**
25	NIAW 3074	25	4	5	3	4	**4.0**	4	6	4	**4.7**	**4.3**
26	CG 1026	26	5	8	7	7	**6.8**	6	5	8	**6.3**	**6.5**
27	DBW 241	27	7	7	4	6	**6.0**	6	4	6	**5.3**	**5.7**
28	PBW 774	28	7	8	6	8	**7.3**	8	6	7	**7.0**	**7.1**
29	MP 3470	29	5	3	3	3	**3.5**	3	4	3	**3.3**	**3.4**
30	GW 499	30	6	7	5	4	**5.5**	5	6	6	**5.7**	**5.6**
31	DBW 242	31	7	8	6	6	**6.8**	7	7	7	**7.0**	**6.9**
32	GW 504	32	4	3	4	2	**3.3**	4	6	4	**4.7**	**4.0**
33	MP 1341	33	6	7	7	7	**6.8**	7	7	7	**7.0**	**6.9**
34	HD 2932(C)	34	3	3	3	3	**3.0**	3	6	4	**4.3**	**3.7**
35	MACS 6714	35	5	5	5	4	**4.8**	3	5	5	**4.3**	**4.5**
36	GW 502	36	6	7	8	6	**6.8**	6	6	6	**6.0**	**6.4**
Mean			**5.4**	**5.7**	**5.6**	**5.0**	**5.4**	**5.1**	**5.9**	**5.4**	**5.5**	**5.5**

Table 23: Grain appearance score of *T. durum* genotypes in NIVT-4

Sr. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	6.7	6.8	5.8	5.4	6.5	**6.2**	5.7	6.1	5.8	5.6	**5.8**	**6.0**
2	GW 1341	02	7.0	7.0	5.7	6.8	7.3	**6.8**	5.8	7.0	6.1	6.2	**6.3**	**6.5**
3	NIAW 1101	03	6.3	6.0	6.0	5.7	5.5	**5.9**	4.7	5.6	4.4	5.4	**5.0**	**5.5**
4	AKDW5012	04	6.1	7.2	6.2	6.8	7.2	**6.7**	5.2	5.4	5.4	4.2	**5.1**	**5.9**
5	DDW 44	05	6.0	7.0	5.8	6.8	7.0	**6.5**	5.6	5.9	5.5	4.8	**5.5**	**6.0**
6	GW 1339	06	5.7	7.2	4.9	6.2	6.8	**6.2**	5.9	4.8	5.7	4.3	**5.2**	**5.7**
7	MACS4064	07	5.6	7.0	5.2	5.8	6.7	**6.1**	5.2	5.2	5.2	4.7	**5.1**	**5.6**
8	MACS4067	08	6.0	6.8	5.8	5.8	6.8	**6.2**	5.0	5.4	5.7	4.8	**5.2**	**5.7**
9	UPD 99	09	6.9	6.7	6.7	5.8	6.4	**6.5**	5.7	5.7	5.6	4.6	**5.4**	**6.0**
10	AKDW 5013	10	6.5	7.0	5.8	7.1	6.8	**6.6**	5.6	5.8	5.7	4.9	**5.5**	**6.1**
11	PBND5128	11	7.0	5.9	6.2	6.5	6.0	**6.3**	5.8	5.6	5.6	5.1	**5.5**	**5.9**
12	HI 8800	12	7.2	6.4	6.9	5.8	6.8	**6.6**	5.2	5.6	5.5	5.7	**5.5**	**6.1**
13	PDW 351	13	7.2	6.2	6.1	7.1	5.8	**6.5**	5.9	5.7	6.0	5.0	**5.7**	**6.1**
14	MPO 1344	14	6.8	6.3	5.6	6.7	6.8	**6.4**	5.1	5.4	6.2	6.0	**5.7**	**6.1**
15	PDW 354	15	6.9	5.6	5.8	6.6	6.6	**6.3**	4.8	5.6	4.8	4.7	**5.0**	**5.6**
16	MACS4071	16	5.0	5.8	5.0	5.6	5.6	**5.4**	4.6	4.8	4.7	4.8	**4.7**	**5.1**
17	HI 8799	17	7.0	6.2	5.9	7.0	7.2	**6.7**	5.4	5.8	5.2	4.6	**5.3**	**6.0**
18	PDW 353	18	7.0	5.6	6.0	7.2	6.8	**6.5**	5.7	5.4	4.8	5.2	**5.3**	**5.9**
19	GW 1338	19	4.8	5.4	5.4	5.6	5.4	**5.3**	5.0	4.4	4.5	4.8	**4.7**	**5.0**
20	UAS 465	20	5.6	5.5	6.6	6.8	5.7	**6.0**	4.6	4.0	4.2	4.4	**4.3**	**5.2**
21	MPO 1343	21	5.4	6.5	5.9	6.2	7.0	**6.2**	5.8	5.2	5.7	5.8	**5.6**	**5.9**
22	WHD 961	22	5.8	5.4	5.6	6.3	6.7	**6.0**	5.0	5.6	5.4	4.5	**5.1**	**5.5**
23	RKD 320	23	7.4	5.5	5.8	7.4	6.8	**6.6**	5.2	5.8	5.5	4.8	**5.3**	**6.0**
24	PDW 352	24	6.9	5.8	6.4	6.8	7.0	**6.6**	5.7	4.4	6.0	5.4	**5.4**	**6.0**
25	GW 1340	25	6.8	5.6	5.6	5.5	6.9	**6.1**	5.3	5.0	5.2	6.1	**5.4**	**5.7**
26	HI 8797	26	7.4	5.7	6.1	5.4	6.8	**6.3**	5.0	4.3	5.7	4.1	**4.8**	**5.5**
27	UAS 464	27	5.8	5.6	5.0	6.6	5.7	**5.7**	4.0	5.8	4.2	6.2	**5.1**	**5.4**
28	HI 8795	28	6.8	6.3	5.2	7.0	7.4	**6.5**	5.7	5.8	6.5	4.6	**5.7**	**6.1**
29	NIAW 1100	29	7.0	5.4	5.6	6.8	4.7	**5.9**	5.9	4.6	4.7	4.8	**5.0**	**5.5**
30	RKD 318	30	6.8	5.8	6.0	6.8	7.1	**6.5**	5.2	5.7	5.6	4.9	**5.4**	**5.9**
31	WHD 962	31	6.7	6.2	6.4	6.9	7.5	**6.7**	5.8	5.6	6.1	5.2	**5.7**	**6.2**
32	HI 8798	32	6.9	6.8	6.3	6.2	5.9	**6.4**	5.7	5.8	4.5	4.3	**5.1**	**5.7**
33	UAS428(C)	33	7.1	5.6	6.7	6.6	6.0	**6.4**	5.4	4.8	5.0	5.7	**5.2**	**5.8**
34	DDW 43	34	6.4	5.3	6.8	7.4	7.0	**6.6**	5.0	4.9	4.7	4.2	**4.7**	**5.6**
35	HI 8737(C)	35	7.0	7.0	6.7	6.3	6.5	**6.7**	4.9	5.6	5.2	5.6	**5.3**	**6.0**
36	HI 8796	36	6.2	6.9	6.0	6.4	6.8	**6.5**	5.9	5.8	5.3	4.3	**5.3**	**5.9**
	Mean		**6.5**	**6.2**	**5.9**	**6.4**	**6.5**	**6.3**	**5.3**	**5.4**	**5.3**	**5.0**	**5.3**	**5.8**

Table 24: Test Weight (kg/hl) of *T. durum* genotypes in NIVT-4

Sr. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	84.8	83.1	82.1	84.2	84.2	**83.7**	79.1	84.6	84.7	84.8	**83.3**	**83.5**
2	GW 1341	02	82.7	82.3	82.9	83.4	81.4	**82.5**	78.2	82.2	84.6	81.7	**81.7**	**82.1**
3	NIAW 1101	03	83.9	82.3	83.0	83.7	81.6	**82.9**	79.5	82.8	81.7	83.5	**81.9**	**82.4**
4	AKDW5012	04	84.1	81.6	83.3	83.7	81.8	**82.9**	76.9	82.8	78.7	81.7	**80.0**	**81.5**
5	DDW 44	05	84.1	81.6	83.1	83.9	82.9	**83.1**	79.0	83.6	82.6	83.3	**82.1**	**82.6**
6	GW 1339	06	84.1	82.8	82.2	84.8	79.3	**82.6**	78.5	83.5	81.9	82.9	**81.7**	**82.2**
7	MACS4064	07	83.3	82.7	82.8	81.4	82.1	**82.5**	79.9	82.3	80.7	81.6	**81.1**	**81.8**
8	MACS4067	08	84.5	81.6	84.0	82.8	82.7	**83.1**	75.6	82.5	82.4	82.5	**80.8**	**81.9**
9	UPD 99	09	84.5	82.1	82.8	83.6	82.8	**83.2**	82.5	84.8	83.2	84.0	**83.6**	**83.4**
10	AKDW 5013	10	84.3	82.6	83.1	83.7	78.4	**82.4**	81.1	83.8	81.9	83.7	**82.6**	**82.5**
11	PBND5128	11	84.5	81.4	84.6	83.2	84.2	**83.6**	81.9	81.8	82.9	82.8	**82.4**	**83.0**
12	HI 8800	12	84.2	82.3	84.2	83.9	83.3	**83.6**	82.1	84.2	84.5	82.6	**83.4**	**83.5**
13	PDW 351	13	84.2	83.2	84.3	84.1	84.5	**84.1**	83.0	84.0	84.3	84.5	**84.0**	**84.0**
14	MPO 1344	14	84.3	83.1	83.0	84.7	82.9	**83.6**	81.5	84.2	82.6	84.4	**83.2**	**83.4**
15	PDW 354	15	84.3	80.5	83.1	84.0	79.4	**82.3**	78.5	84.3	82.8	84.3	**82.5**	**82.4**
16	MACS4071	16	84.8	80.7	83.6	81.5	84.4	**83.0**	80.1	83.6	81.7	82.5	**82.0**	**82.5**
17	HI 8799	17	84.3	82.8	81.3	84.2	80.9	**82.7**	84.5	84.4	82.6	84.7	**84.1**	**83.4**
18	PDW 353	18	83.9	76.9	80.8	82.0	81.0	**80.9**	78.6	82.4	78.6	80.8	**80.1**	**80.5**
19	GW 1338	19	84.2	80.2	82.8	80.4	78.5	**81.2**	78.5	80.2	76.9	80.3	**79.0**	**80.1**
20	UAS 465	20	84.7	77.9	83.9	84.8	82.3	**82.7**	77.7	84.4	77.6	84.2	**81.0**	**81.8**
21	MPO 1343	21	84.0	83.4	83.1	84.0	80.7	**83.0**	82.9	84.4	84.3	82.7	**83.6**	**83.3**
22	WHD 961	22	84.7	79.7	83.9	84.4	84.0	**83.3**	79.3	84.8	80.0	83.9	**82.0**	**82.7**
23	RKD 320	23	84.8	81.0	84.5	84.3	83.5	**83.6**	78.8	83.7	82.2	83.8	**82.1**	**82.9**
24	PDW 352	24	84.1	82.9	82.7	82.3	84.5	**83.3**	82.0	84.9	83.5	84.9	**83.8**	**83.6**
25	GW 1340	25	84.6	81.9	82.3	81.0	82.5	**82.5**	80.5	81.7	81.6	81.7	**81.4**	**81.9**
26	HI 8797	26	84.8	79.4	81.9	80.9	79.6	**81.3**	80.2	83.5	79.6	83.5	**81.7**	**81.5**
27	UAS 464	27	84.7	77.7	84.4	83.9	78.7	**81.9**	77.2	82.0	76.2	82.0	**79.4**	**80.6**
28	HI 8795	28	84.7	82.8	81.3	83.4	84.7	**83.4**	82.9	84.8	84.2	84.8	**84.2**	**83.8**
29	NIAW 1100	29	84.3	77.8	83.4	83.8	75.9	**81.0**	78.4	83.1	79.8	83.1	**81.1**	**81.1**
30	RKD 318	30	84.0	81.2	83.8	84.7	81.8	**83.1**	81.0	84.1	83.1	84.1	**83.1**	**83.1**
31	WHD 962	31	84.7	81.4	83.7	84.1	82.7	**83.3**	81.6	83.5	83.4	83.5	**83.0**	**83.2**
32	HI 8798	32	84.0	81.8	82.5	84.2	81.8	**82.9**	80.7	83.3	83.6	83.3	**82.7**	**82.8**
33	UAS428(C)	33	84.8	81.8	82.7	83.7	79.0	**82.4**	79.6	83.6	80.9	83.6	**81.9**	**82.2**
34	DDW 43	34	81.8	76.6	83.3	84.2	82.0	**81.6**	78.3	84.3	78.6	84.3	**81.4**	**81.5**
35	HI 8737(C)	35	84.4	82.9	83.4	84.2	79.3	**82.8**	83.2	83.5	84.6	83.5	**83.7**	**83.3**
36	HI 8796	36	84.0	80.9	83.4	84.7	82.3	**83.1**	81.6	84.6	79.0	84.6	**82.5**	**82.8**
	Mean		**84.2**	**81.2**	**83.1**	**83.6**	**81.7**	**82.8**	**80.1**	**83.5**	**81.7**	**83.3**	**82.2**	**82.5**

Table 25: Protein Content (%) of *T. durum* genotypes in NIVT-4

r. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	11.2	12.4	11.2	11.5	11.5	**11.6**	11.3	11.1	12.6	11.4	**11.6**	**11.6**
2	GW 1341	02	11.8	12.3	12.6	11.3	12.6	**12.1**	12.6	12.0	11.5	12.8	**12.2**	**12.2**
3	NIAW 1101	03	12.2	12.8	12.8	12.8	11.3	**12.4**	11.3	12.8	11.9	12.5	**12.1**	**12.3**
4	AKDW5012	04	12.6	12.5	12.4	12.6	12.5	**12.5**	12.3	12.4	11.0	12.4	**12.0**	**12.3**
5	DDW 44	05	11.5	11.2	12.8	11.0	11.4	**11.6**	11.4	12.5	12.6	11.1	**11.9**	**11.7**
6	GW 1339	06	12.7	11.6	12.0	11.2	11.8	**11.9**	11.8	12.0	12.0	11.9	**11.9**	**11.9**
7	MACS4064	07	11.6	11.7	11.6	11.9	12.6	**11.9**	12.8	11.4	12.4	12.7	**12.3**	**12.1**
8	MACS4067	08	11.9	11.0	11.7	11.8	12.4	**11.8**	12.4	11.5	12.0	12.6	**12.1**	**11.9**
9	UPD 99	09	11.0	11.9	11.0	11.6	12.7	**11.6**	12.7	11.0	11.1	12.3	**11.8**	**11.7**
10	AKDW 5013	10	12.5	12.8	12.1	12.5	11.3	**12.2**	11.3	12.9	13.2	12.5	**12.5**	**12.4**
11	PBND 5128	11	11.4	12.5	12.9	12.4	11.7	**12.2**	11.7	12.6	12.2	12.4	**12.2**	**12.2**
12	HI 8800	12	12.8	12.3	12.0	12.7	11.9	**12.3**	11.4	12.0	13.1	12.6	**12.3**	**12.3**
13	PDW 351	13	12.5	11.1	11.6	11.6	12.5	**11.9**	12.5	11.6	11.5	11.5	**11.8**	**11.8**
14	MPO 1344	14	12.4	12.5	11.4	11.8	12.4	**12.1**	12.3	11.4	11.9	11.9	**11.9**	**12.0**
15	PDW 354	15	11.1	11.7	11.3	11.2	12.6	**11.6**	12.8	11.2	11.0	11.0	**11.5**	**11.5**
16	MACS4071	16	11.9	12.8	12.5	12.6	11.5	**12.3**	11.5	12.4	12.6	12.6	**12.3**	**12.3**
17	HI 8799	17	12.7	11.2	12.3	12.3	11.9	**12.1**	11.1	12.3	12.8	12.0	**12.1**	**12.1**
18	PDW 353	18	12.6	12.6	11.2	11.4	11.0	**11.8**	11.0	11.2	12.4	12.4	**11.8**	**11.8**
19	GW 1338	19	12.3	11.0	12.1	11.7	12.6	**11.9**	12.6	12.1	12.0	12.0	**12.2**	**12.1**
20	UAS 465	20	12.4	11.3	12.8	12.0	12.0	**12.1**	12.0	12.5	11.1	11.1	**11.7**	**11.9**
21	MPO 1343	21	12.7	12.5	12.7	11.9	12.4	**12.4**	12.4	12.7	12.5	12.5	**12.5**	**12.5**
22	WHD 961	22	11.6	12.7	11.7	12.3	12.0	**12.1**	12.0	11.7	12.2	11.3	**11.8**	**11.9**
23	RKD 320	23	11.8	12.1	11.2	11.7	11.1	**11.6**	11.1	11.2	11.8	12.5	**11.7**	**11.6**
24	PDW 352	24	11.2	11.0	11.0	12.5	12.5	**11.6**	12.5	11.8	12.6	12.7	**12.4**	**12.0**
25	GW 1340	25	12.6	11.9	12.3	12.7	12.2	**12.3**	12.2	12.3	12.4	12.1	**12.3**	**12.3**
26	HI 8797	26	12.3	11.8	12.7	12.5	11.8	**12.2**	11.3	12.7	11.6	11.0	**11.7**	**11.9**
27	UAS 464	27	11.4	12.0	11.6	12.4	12.0	**11.9**	12.0	11.6	11.8	11.9	**11.8**	**11.9**
28	HI 8795	28	11.7	12.4	11.5	12.7	11.6	**12.0**	11.6	11.5	11.2	11.8	**11.5**	**11.8**
29	NIAW 1100	29	12.0	12.8	12.0	11.6	12.7	**12.2**	12.7	12.0	12.6	12.0	**12.3**	**12.3**
30	RKD 318	30	11.9	11.8	11.8	11.8	12.3	**11.9**	12.3	11.8	12.5	12.4	**12.3**	**12.1**
31	WHD 962	31	12.3	11.4	12.4	11.2	11.9	**11.8**	11.1	12.4	11.3	12.8	**11.9**	**11.9**
32	HI 8798	32	11.7	11.6	11.3	12.6	12.8	**12.0**	12.8	11.3	11.7	11.8	**11.9**	**12.0**
33	UAS428(C)	33	12.5	12.6	12.5	12.5	12.5	**12.5**	12.5	12.4	12.5	12.5	**12.5**	**12.5**
34	DDW 43	34	12.7	11.3	11.8	11.3	11.3	**11.7**	11.3	11.7	12.3	11.7	**11.8**	**11.7**
35	HI 8737(C)	35	12.5	12.5	12.4	12.4	12.6	**12.5**	12.6	12.5	12.5	12.4	**12.5**	**12.5**
36	HI 8796	36	11.5	12.6	11.9	11.3	12.6	**12.0**	12.3	11.0	12.3	11.5	**11.8**	**11.9**
	Mean		**12.0**	**12.0**	**12.0**	**12.0**	**12.1**	**12.0**	**12.0**	**12.0**	**12.1**	**12.1**	**12.1**	**12.0**

Table 26: Sedimentation Value (ml) of *T. durum* genotypes in NIVT-4

Sr. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	42	38	35	43	32	**38**	36	30	36	40	**36**	**37**
2	GW 1341	02	40	40	42	40	38	**40**	38	40	40	41	**40**	**40**
3	NIAW 1101	03	39	36	42	38	41	**39**	42	41	38	41	**41**	**40**
4	AKDW5012	04	41	30	47	41	43	**40**	42	35	40	43	**40**	**40**
5	DDW 44	05	42	37	42	43	46	**42**	41	42	42	42	**42**	**42**
6	GW 1339	06	30	45	37	44	39	**39**	42	41	38	30	**38**	**38**
7	MACS4064	07	41	46	34	42	41	**41**	37	38	42	42	**40**	**40**
8	MACS4067	08	41	32	42	32	39	**37**	34	37	36	43	**38**	**37**
9	UPD 99	09	33	35	36	37	33	**35**	32	34	32	38	**34**	**34**
10	Akdw 5013	10	42	48	40	44	47	**44**	41	43	40	41	**41**	**43**
11	PBND5128	11	38	43	46	42	43	**42**	40	31	37	43	**38**	**40**
12	HI 8800	12	42	42	38	43	38	**41**	41	43	40	44	**42**	**41**
13	PDW 351	13	33	35	41	50	41	**40**	38	35	42	42	**39**	**40**
14	MPO 1344	14	40	38	38	38	33	**37**	41	39	41	32	**38**	**38**
15	PDW 354	15	47	42	42	40	35	**41**	40	43	42	37	**41**	**41**
16	MACS4071	16	43	31	40	47	40	**40**	42	42	42	43	**42**	**41**
17	HI 8799	17	28	38	41	42	42	**38**	40	38	43	42	**41**	**39**
18	PDW 353	18	37	39	43	38	32	**38**	41	35	41	43	**40**	**39**
19	GW 1338	19	38	43	43	40	41	**41**	43	41	43	49	**44**	**43**
20	UAS 465	20	32	39	42	38	37	**38**	33	32	38	38	**35**	**36**
21	MPO 1343	21	38	34	33	38	37	**36**	32	37	39	40	**37**	**37**
22	WHD 961	22	33	40	35	42	35	**37**	35	43	45	37	**40**	**39**
23	RKD 320	23	36	49	44	51	48	**46**	45	48	45	42	**45**	**45**
24	PDW 352	24	43	35	37	52	44	**42**	44	43	38	38	**41**	**41**
25	GW 1340	25	42	45	42	48	40	**43**	47	44	40	40	**43**	**43**
26	HI 8797	26	43	36	35	42	38	**39**	42	35	38	38	**38**	**39**
27	UAS 464	27	38	39	40	30	35	**36**	35	34	40	43	**38**	**37**
28	HI 8795	28	42	36	37	42	40	**39**	40	41	39	42	**41**	**40**
29	NIAW 1100	29	45	41	38	32	42	**40**	37	40	40	48	**41**	**40**
30	RKD 318	30	43	40	40	40	40	**41**	38	35	41	42	**39**	**40**
31	WHD 962	31	40	41	41	34	43	**40**	40	37	40	48	**41**	**41**
32	HI 8798	32	30	33	42	35	32	**34**	41	41	39	42	**41**	**38**
33	UAS428(C)	33	40	38	40	40	41	**40**	37	40	41	39	**39**	**40**
34	DDW 43	34	38	40	38	38	40	**39**	38	41	42	40	**40**	**40**
35	HI 8737(C)	35	40	42	43	41	41	**41**	41	40	42	41	**41**	**41**
36	HI 8796	36	34	38	38	41	42	**39**	43	38	40	40	**40**	**39**
	Mean		**39**	**39**	**40**	**41**	**39**	**40**	**39**	**39**	**40**	**41**	**40**	**40**

Table 27: Yellow Berry Incidence of *T. durum* genotypes in NIVT-4

Sr. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	1.2	0	0	0	0	**0.2**	0	0	0	6.2	**1.6**	**0.9**
2	GW 1341	02	1.1	0	0	0	0	**0.2**	20	0	0	1.3	**5.3**	**2.8**
3	NIAW 1101	03	1.4	0	0	0	0	**0.3**	0	0	4	9.2	**3.3**	**1.8**
4	AKDW5012	04	2	0	0	0	0	**0.4**	0	3	0	30.4	**8.4**	**4.4**
5	DDW 44	05	1.5	0	2.4	0	1.4	**1.1**	0	0	0	9.5	**2.4**	**1.7**
6	GW 1339	06	3.2	0	4.7	0	0	**1.6**	0	7	0	28.6	**8.9**	**5.2**
7	MACS4064	07	1.4	0	0	0	0	**0.3**	0	3	0	11.7	**3.7**	**2.0**
8	MACS4067	08	0	0	0	2.4	0	**0.5**	0	0	0	8.2	**2.1**	**1.3**
9	UPD 99	09	1.3	0	0	0	0	**0.3**	0	2	0	12.6	**3.7**	**2.0**
10	AKDW 5013	10	1.7	0	2.2	0	0	**0.8**	0	2	0	8.9	**2.7**	**1.8**
11	PBND5128	11	1.2	0	0	0	2	**0.6**	0	0	0	7.3	**1.8**	**1.2**
12	HI 8800	12	0	0	0	2.1	0	**0.4**	0	0	2	4.8	**1.7**	**1.1**
13	PDW 351	13	1.7	0	2.1	0	3.8	**1.5**	0	3	0	4.3	**1.8**	**1.7**
14	MPO 1344	14	1	0	4.7	0	2.4	**1.6**	0	11	1.2	7.6	**5.0**	**3.3**
15	PDW 354	15	21.7	0	0	0	0	**4.3**	0	0	1	3.2	**1.1**	**2.7**
16	MACS4071	16	0	0	9.2	0	0	**1.8**	0	12	0	14	**6.5**	**4.2**
17	HI 8799	17	1.4	0	2.6	0	0	**0.8**	0	3.3	6	9.2	**4.6**	**2.7**
18	PDW 353	18	4.9	0	0	0	0	**1.0**	0	4.2	0	12.8	**4.3**	**2.6**
19	GW 1338	19	2.3	0	8.3	4.3	0	**3.0**	0	3.2	0	7.9	**2.8**	**2.9**
20	UAS 465	20	4.8	0	0	0	0	**1.0**	0	17.3	0	11.7	**7.3**	**4.1**
21	MPO 1343	21	3.2	0	0	3.4	0	**1.3**	0	3.7	4.2	17.2	**6.3**	**3.8**
22	WHD 961	22	4.8	0	0	2	0	**1.4**	0	2.4	0	3.2	**1.4**	**1.4**
23	RKD 320	23	0	0	0	0	0	**0.0**	0	4.7	0	22.7	**6.9**	**3.4**
24	PDW 352	24	4.2	0	0	0	0	**0.8**	0	1.6	0	4.9	**1.6**	**1.2**
25	GW 1340	25	3.2	0	0	0	0	**0.6**	0	22.7	3	6.3	**8.0**	**4.3**
26	HI 8797	26	0	0	0	2.1	0	**0.4**	0	2.3	0	7.2	**2.4**	**1.4**
27	UAS 464	27	4.7	0	0	0	0	**0.9**	0	3	0	38.6	**10.4**	**5.7**
28	HI 8795	28	0	0	0	0	0	**0.0**	0	2	0	2.7	**1.2**	**0.6**
29	NIAW 1100	29	1.5	0	0	0	0	**0.3**	0	4.7	0	4.9	**2.4**	**1.4**
30	RKD 318	30	2	0	0	0	0	**0.4**	0	2.6	0	6.9	**2.4**	**1.4**
31	WHD 962	31	4.5	0	0	0	0	**0.9**	0	3.4	0	7.8	**2.8**	**1.9**
32	HI 8798	32	4.3	0	0	0	0	**0.9**	0	13	0	4.3	**4.3**	**2.6**
33	UAS428(C)	33	20	0	0	3.4	0	**4.7**	0	12.4	0	27.7	**10.0**	**7.4**
34	DDW 43	34	7.2	0	0	0	2	**1.8**	0	9.7	0	4.3	**3.5**	**2.7**
35	HI 8737(C)	35	0	0	0	0	0	**0.0**	0	2	4.6	44.8	**12.9**	**6.4**
36	HI 8796	36	7.9	0	0	2	0	**2.0**	0	7.4	3.4	40.2	**12.8**	**7.4**
	Mean		**3.2**	**0**	**1**	**0.5**	**0.3**	**1.0**	**0.6**	**4.7**	**0.8**	**12.6**	**4.7**	**2.8**

Table 28: Yellow Pigment (ppm) of *T. durum* genotypes in NIVT- 4

Sr. No	Entries	Trial code	CZ						PZ					Overall Mean
			Indore	Junagadh	Kota	P'kheda	Vijapur	Mean	Dharwad	Niphad	Pune	Ugar	Mean	
1	HI 8801	01	6.9	5.3	5.9	5.4	5.5	**5.8**	5.6	6.1	5.7	5.4	**5.7**	**5.8**
2	GW 1341	02	4.8	5.4	5.1	5.5	6.1	**5.4**	5.7	5.9	5.8	5.8	**5.8**	**5.6**
3	NIAW 1101	03	4.9	5.1	5.2	5.5	5.9	**5.3**	6.1	5.1	5.2	5.6	**5.5**	**5.4**
4	AKDW5012	04	5.2	5.7	6.1	5.3	5.6	**5.6**	5.0	5.2	6.9	7.5	**6.2**	**5.9**
5	DDW 44	05	5.4	6.1	6.0	6.4	6.1	**6.0**	4.8	6.1	4.8	5.3	**5.3**	**5.6**
6	GW 1339	06	6.2	6.8	5.3	5.4	5.9	**5.9**	5.7	6.5	4.9	5.4	**5.6**	**5.8**
7	MACS4064	07	7.0	5.1	5.7	5.3	6.7	**6.0**	5.6	5.3	5.2	5.1	**5.3**	**5.6**
8	MACS4067	08	5.9	6.0	5.7	5.4	6.3	**5.9**	5.7	5.7	5.4	5.7	**5.6**	**5.7**
9	UPD 99	09	5.4	7.1	5.8	5.5	6.8	**6.1**	6.7	5.7	6.2	6.1	**6.2**	**6.1**
10	AKDW 5013	10	7.3	6.3	6.0	5.5	5.3	**6.1**	5.7	5.8	7.0	6.8	**6.3**	**6.2**
11	PBND5128	11	6.0	5.4	7.0	5.8	5.8	**6.0**	5.3	7.0	5.9	5.1	**5.8**	**5.9**
12	HI 8800	12	4.5	6.2	6.0	5.6	5.6	**5.6**	5.8	7.5	5.4	6.6	**6.3**	**6.0**
13	PDW 351	13	5.8	5.9	6.0	5.5	6.1	**5.9**	6.0	6.0	7.0	6.8	**6.5**	**6.2**
14	MPO 1344	14	5.5	5.8	6.5	6.7	5.7	**6.0**	5.1	6.0	6.0	6.3	**5.9**	**5.9**
15	PDW 354	15	4.8	4.5	4.7	5.6	5.3	**5.0**	5.2	5.5	4.5	5.4	**5.2**	**5.1**
16	MACS4071	16	5.2	5.1	5.9	5.3	6.4	**5.6**	5.1	5.7	5.8	6.2	**5.7**	**5.6**
17	HI 8799	17	5.0	6.6	4.5	5.3	5.4	**5.4**	5.1	5.9	5.5	5.9	**5.6**	**5.5**
18	PDW 353	18	6.7	6.2	5.8	5.5	5.3	**5.9**	5.2	5.9	4.8	5.8	**5.4**	**5.7**
19	GW 1338	19	5.9	6.1	6.3	6.1	5.7	**6.0**	5.8	5.8	5.2	5.5	**5.6**	**5.8**
20	UAS 465	20	6.8	5.6	6.0	6.8	6.0	**6.2**	5.3	6.3	5.0	5.1	**5.4**	**5.8**
21	MPO 1343	21	5.3	5.5	6.2	6.0	5.9	**5.8**	5.7	6.2	6.7	6.6	**6.3**	**6.0**
22	WHD 961	22	5.4	5.1	6.9	6.2	5.9	**5.9**	5.1	6.8	5.9	6.2	**6.0**	**6.0**
23	RKD 320	23	5.7	5.8	6.2	6.4	5.1	**5.8**	5.2	6.9	6.8	7.1	**6.5**	**6.2**
24	PDW 352	24	6.3	5.2	5.5	6.3	5.4	**5.7**	5.4	6.2	5.3	5.6	**5.6**	**5.7**
25	GW 1340	25	6.4	5.7	5.6	5.1	5.7	**5.7**	5.5	5.5	5.4	5.5	**5.5**	**5.6**
26	HI 8797	26	5.4	6.1	5.8	5.4	5.7	**5.7**	5.1	5.6	5.7	5.1	**5.4**	**5.5**
27	UAS 464	27	5.8	5.1	5.9	5.7	6.4	**5.8**	5.7	5.8	6.3	5.8	**5.9**	**5.8**
28	HI 8795	28	5.3	5.7	6.1	5.7	5.7	**5.7**	5.1	5.9	6.4	5.2	**5.7**	**5.7**
29	NIAW 1100	29	5.2	5.6	5.7	6.4	5.5	**5.7**	6.0	6.1	4.4	5.7	**5.6**	**5.6**
30	RKD 318	30	6.9	6.3	6.7	5.7	5.1	**6.1**	5.2	5.7	5.8	6.1	**5.7**	**5.9**
31	WHD 962	31	4.8	5.4	5.8	5.5	5.7	**5.4**	5.7	5.7	4.4	5.5	**5.3**	**5.4**
32	HI 8798	32	4.9	5.8	5.2	5.1	6.0	**5.4**	5.5	5.8	5.8	5.6	**5.7**	**5.5**
33	UAS428(C)	33	6.5	6.5	.6.6	6.4	6.4	**6.5**	6.5	6.5	6.4	6.3	**6.4**	**6.4**
34	DDW 43	34	5.4	5.3	6.6	6.0	5.0	**5.7**	6.3	5.7	5.2	5.9	**5.8**	**5.7**
35	HI 8737(C)	35	6.4	6.4	6.5	6.6	6.5	**6.5**	6.6	6.4	6.3	6.5	**6.5**	**6.5**
36	HI 8796	36	6.0	5.3	6.0	5.0	6.1	**5.7**	6.2	6.3	4.8	5.7	**5.8**	**5.7**
	Mean		**5.7**	**5.8**	**5.9**	**5.7**	**5.8**	**5.8**	**5.6**	**6.0**	**5.7**	**5.9**	**5.8**	**5.8**

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

Sr. No.	Entries	Trial Code	NWPZ						NEPZ				
			Hisar	Ludhiana	Delhi	Pantnagar	Durgapur	Mean	Kanpur	Pusa	Sabour	Varanasi	Mean
1	WH 1142(C)	01	6.0	6.0	6.4	6.2	6.6	**6.2**	6.0	5.9	5.4	5.5	**5.7**
2	JWS 151	02	5.9	5.9	6.0	6.0	6.3	**6.0**	6.0	5.8	5.5	6.2	**5.9**
3	NIAW 3170	03	6.0	5.9	6.0	5.8	6.4	**6.0**	5.9	6.0	5.6	5.7	**5.8**
4	DBW 252	04	5.7	5.6	5.5	6.4	6.5	**5.9**	6.1	5.9	5.8	5.8	**5.9**
5	UP 2989	05	6.3	6.2	5.9	6.5	6.5	**6.3**	6.3	6.0	5.9	6.0	**6.1**
6	BRW 3798	06	5.8	6.3	5.4	6.5	6.4	**6.1**	6.2	5.7	6.0	5.9	**6.0**
7	WH 1236	07	6.3	6.5	6.7	6.6	7.0	**6.6**	6.3	5.9	5.7	5.8	**5.9**
8	DBW 245	08	5.8	5.9	5.8	6.1	6.4	**6.0**	6.1	5.7	5.6	5.7	**5.8**
9	NIAW 3217	09	6.2	5.9	5.5	6.5	6.2	**6.1**	6.2	6.2	6.0	5.9	**6.1**
10	HI 1628	10	5.9	6.0	5.9	6.4	6.0	**6.0**	6.0	5.8	5.6	5.5	**5.7**
11	DBW 93(C)	11	5.7	6.0	6.0	6.0	6.1	**6.0**	6.1	6.2	5.6	5.7	**5.9**
12	CG 1027	12	5.9	6.0	5.9	6.3	6.7	**6.2**	5.9	6.6	5.7	5.5	**5.9**
13	MP 1334	13	5.8	5.5	5.7	5.5	6.4	**5.8**	5.9	5.9	5.4	5.6	**5.7**
14	DBW 110(C)	14	6.3	5.3	5.9	6.4	6.6	**6.1**	6.2	5.8	5.4	6.0	**5.9**
15	MP 3475	15	5.9	5.7	5.6	5.9	6.8	**6.0**	5.9	6.1	5.8	5.5	**5.8**
16	MP 1331	16	5.7	5.8	5.3	5.7	5.9	**5.7**	5.8	6.0	5.3	5.4	**5.6**
17	K 1616	17	5.8	5.9	5.6	5.8	6.0	**5.8**	5.9	6.1	6.0	5.9	**6.0**
18	DBW 244	18	5.6	6.2	5.8	5.9	5.4	**5.8**	6.0	6.2	5.4	5.6	**5.8**
19	PBW 775	19	6.0	6.1	6.0	6.2	6.4	**6.1**	5.9	5.9	5.8	6.1	**5.9**
20	HD 3273	20	5.0	5.9	5.6	5.8	5.6	**5.6**	6.2	5.5	5.0	5.6	**5.6**
21	UP 2988	21	6.4	6.0	5.8	6.6	6.2	**6.2**	6.4	6.6	6.0	5.8	**6.2**
22	HD 3274	22	5.4	6.1	5.6	5.8	5.9	**5.8**	6.0	6.0	5.4	5.7	**5.8**
23	MACS 6696	23	5.6	6.3	6.0	5.9	6.1	**6.0**	5.9	6.2	5.8	5.5	**5.9**
24	MP 1332	24	6.0	6.4	5.3	6.0	6.2	**6.0**	5.8	6.3	5.8	5.5	**5.9**
25	K 1615	25	6.1	6.4	5.5	6.1	6.4	**6.1**	5.9	6.3	6.0	6.2	**6.1**
26	HD 3275	26	5.9	6.1	5.8	5.9	6.3	**6.0**	5.8	6.2	5.7	5.8	**5.9**
27	HP 1967	27	6.0	5.9	5.5	6.0	6.0	**5.9**	5.7	6.3	5.8	5.9	**5.9**
28	MP 1333	28	6.0	6.0	5.6	5.4	5.4	**5.7**	5.5	5.8	5.4	5.5	**5.6**
29	HD 2888(C)	29	6.3	5.9	5.7	6.0	6.2	**6.0**	5.6	6.3	6.2	6.4	**6.1**
30	MACS 6695	30	5.7	6.0	5.5	5.8	6.7	**5.9**	6.0	6.0	5.4	5.0	**5.6**
31	BRW 3806	31	5.9	6.2	5.9	6.0	6.1	**6.0**	5.7	6.2	5.8	5.5	**5.8**
32	NW 7008	32	5.8	6.2	5.5	6.2	6.0	**5.9**	5.9	6.3	5.8	5.7	**5.9**
33	UAS 395	33	5.4	5.9	5.4	6.0	5.7	**5.7**	6.0	5.9	5.3	4.9	**5.5**
34	UAS 394	34	5.8	6.0	6.0	6.2	6.6	**6.1**	5.1	6.2	6.0	5.6	**5.7**
35	PBW 776	35	6.0	6.2	5.6	6.3	5.8	**6.0**	5.6	5.9	5.0	5.9	**5.6**
36	WH 1235	36	5.3	5.9	5.4	5.9	5.9	**5.7**	5.9	5.7	5.6	5.5	**5.7**
	Mean		**6.0**	**5.7**	**6.1**	**6.2**	**6.0**	**5.9**	**6.0**	**5.7**	**5.7**	**5.8**	**6.0**

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

Sr. No.	Entries	Trial Code	CZ					PZ			Mean	Overall mmean
			Indore	Kota	Junagrh	Vijapur	Mean	Pune	Dharwad	Niphad		
1	WH 1142(C)	01	6.1	5.9	6.0	6.0	**6.0**	5.8	5.5	5.8	**5.7**	**5.9**
2	JWS 151	02	6.3	5.8	6.4	6.0	**6.1**	5.9	5.9	5.9	**5.9**	**6.0**
3	NIAW 3170	03	6.1	5.6	6.1	6.0	**5.9**	5.7	5.5	5.7	**5.6**	**5.8**
4	DBW 252	04	6.3	5.5	6.3	6.0	**6.0**	5.6	5.4	5.6	**5.5**	**5.8**
5	UP 2989	05	6.2	6.0	6.6	6.1	**6.2**	6.2	6.0	6.2	**6.1**	**6.2**
6	BRW 3798	06	6.4	5.5	6.4	6.1	**6.1**	6.1	6.2	6.1	**6.1**	**6.1**
7	WH 1236	07	5.9	5.5	6.2	5.9	**5.9**	6.4	5.8	6.4	**6.2**	**6.1**
8	DBW 245	08	5.8	5.0	6.5	5.7	**5.7**	5.8	5.9	5.8	**5.8**	**5.8**
9	NIAW 3217	09	6.2	5.2	6.5	6.0	**6.0**	6.2	5.8	6.2	**6.1**	**6.0**
10	HI 1628	10	6.0	5.3	6.6	5.5	**5.8**	6.0	5.7	6.0	**5.9**	**5.9**
11	DBW 93(C)	11	6.0	5.0	6.1	5.9	**5.8**	5.8	5.5	5.8	**5.7**	**5.8**
12	CG 1027	12	6.6	6.0	6.3	6.0	**6.2**	5.7	5.6	5.7	**5.6**	**6.0**
13	MP 1331	13	5.9	5.8	5.8	6.1	**5.9**	5.7	5.4	5.7	**5.6**	**5.7**
14	DBW 110(C)	14	5.6	5.6	6.4	6.2	**6.0**	5.7	5.7	5.7	**5.7**	**5.9**
15	MP 3475	15	6.2	5.5	6.6	5.9	**6.0**	6.1	6.0	6.1	**6.1**	**6.0**
16	MP 1334	16	5.9	5.6	6.4	6.0	**6.0**	5.7	5.6	5.7	**5.6**	**5.7**
17	K 1616	17	5.9	6.0	6.5	6.2	**6.1**	5.9	5.8	5.9	**5.8**	**5.9**
18	DBW 244	18	5.7	5.5	6.6	5.7	**5.9**	6.1	5.9	6.1	**6.0**	**5.9**
19	PBW 775	19	6.1	5.9	6.6	6.5	**6.3**	6.0	5.7	6.0	**5.9**	**6.1**
20	HD 3273	20	5.3	5.4	6.5	5.7	**5.7**	6.1	5.4	6.1	**5.9**	**5.7**
21	UP 2988	21	6.7	6.4	6.5	6.3	**6.5**	5.7	5.8	5.7	**5.7**	**6.1**
22	HD 3274	22	6.2	5.8	6.6	6.7	**6.3**	6.2	5.4	6.2	**5.9**	**5.9**
23	MACS 6696	23	6.0	5.7	6.1	5.5	**5.8**	6.1	6.3	6.1	**6.2**	**6.0**
24	MP 1332	24	6.1	5.6	6.6	6.2	**6.1**	6.3	5.4	6.3	**6.0**	**6.0**
25	K 1615	25	6.7	5.5	6.8	6.0	**6.3**	6.6	6.4	6.6	**6.5**	**6.2**
26	HD 3275	26	5.9	5.4	6.5	6.4	**6.1**	6.6	5.3	6.6	**6.1**	**6.0**
27	HP 1967	27	6.0	5.7	6.5	6.0	**6.1**	5.9	5.6	5.9	**5.8**	**5.9**
28	MP 1333	28	5.4	5.4	6.5	6.3	**5.9**	5.9	5.0	5.9	**5.6**	**5.7**
29	HD 2888(C)	29	5.7	6.2	6.6	5.4	**6.0**	5.9	6.0	5.9	**5.9**	**6.0**
30	MACS 6695	30	5.8	5.3	6.6	5.9	**5.9**	6.0	5.8	6.0	**5.9**	**5.8**
31	BRW 3806	31	5.8	5.3	6.4	5.8	**5.8**	6.1	5.5	6.1	**5.9**	**5.9**
32	NW 7008	32	6.0	5.7	6.2	5.5	**5.8**	6.0	5.6	6.0	**5.9**	**5.9**
33	UAS 395	33	5.9	5.2	6.1	5.8	**5.8**	5.5	4.8	5.5	**5.3**	**5.6**
34	UAS 394	34	6.0	5.6	6.2	5.7	**5.9**	5.4	5.2	5.4	**5.3**	**5.8**
35	PBW 776	35	6.3	5.5	6.4	5.8	**6.0**	5.7	5.8	5.7	**5.7**	**5.8**
36	WH 1235	36	6.2	5.7	6.4	6.4	**6.2**	5.9	5.4	5.9	**5.7**	**5.8**
	Mean		**5.6**	**6.4**	**6.0**	**6.0**	**5.9**	**5.7**	**5.9**	**5.8**	**5.9**	**5.9**

Table 30: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	NWPZ						NEPZ				
			Hisar	Ludhiana	Delhi	Pantnagar	Durgapur	Mean	Kanpur	Pusa	Sabour	Varanasi	Mean
1	WH 1142(C)	01	83.6	83.1	85.7	86.0	83.9	**84.5**	86.2	81.6	78.7	85.0	**82.9**
2	JWS 151	02	83.2	82.7	82.2	82.1	83.0	**82.6**	83.0	81.0	76.7	85.3	**81.5**
3	NIAW 3170	03	82.9	82.0	80.6	82.9	81.7	**82.0**	83.5	80.8	77.0	83.0	**81.1**
4	DBW 252	04	84.4	83.2	78.4	84.3	81.5	**82.4**	83.5	80.5	80.7	85.1	**82.5**
5	UP 2989	05	85.7	82.1	81.8	84.3	83.8	**83.5**	85.5	83.6	79.9	85.6	**83.7**
6	BRW 3798	06	83.3	83.5	80.1	85.0	84.6	**83.3**	83.7	82.6	82.0	84.3	**83.2**
7	WH 1236	07	85.2	83.8	84.3	83.6	83.0	**84.0**	83.7	81.0	77.9	84.5	**81.8**
8	DBW 245	08	82.2	84.4	79.8	80.9	84.2	**82.3**	83.5	79.5	78.3	84.6	**81.5**
9	NIAW 3217	09	84.2	82.4	82.8	84.1	83.8	**83.5**	85.2	82.4	80.6	84.8	**83.3**
10	HI 1628	10	84.5	83.8	81.0	84.4	80.6	**82.9**	84.6	80.0	78.0	84.6	**81.8**
11	DBW 93(C)	11	84.6	84.7	85.6	83.2	82.3	**84.1**	84.4	82.3	81.1	85.4	**83.3**
12	CG 1027	12	82.3	83.2	81.7	83.3	83.8	**82.9**	84.6	81.7	79.4	82.7	**82.1**
13	MP 1334	13	84.0	84.0	81.6	83.8	82.8	**83.2**	84.0	82.8	77.7	85.0	**82.4**
14	DBW 110(C)	14	81.9	83.0	84.2	83.9	81.6	**82.9**	85.1	80.3	77.5	82.1	**81.3**
15	MP 3475	15	85.4	84.8	83.2	84.3	85.5	**84.6**	85.6	82.0	81.9	85.6	**83.8**
16	MP 1331	16	83.8	82.7	78.0	82.3	80.3	**81.4**	83.3	83.3	77.5	82.9	**81.8**
17	K 1616	17	85.2	85.4	81.6	84.2	82.9	**83.9**	83.6	83.7	83.3	85.7	**84.1**
18	DBW 244	18	83.4	83.6	83.7	81.3	80.4	**82.5**	82.2	81.0	77.9	84.4	**81.4**
19	PBW 775	19	84.2	82.5	82.0	83.5	82.8	**83.0**	84.1	83.2	80.0	85.8	**83.3**
20	HD 3273	20	80.1	80.5	84.0	84.2	78.8	**81.5**	84.8	81.7	79.2	85.0	**82.7**
21	UP 2988	21	84.7	83.2	84.0	85.3	83.6	**84.2**	82.3	82.9	83.4	85.0	**83.4**
22	HD 3274	22	83.5	82.5	83.7	83.3	78.9	**82.4**	84.5	82.0	78.6	85.8	**82.7**
23	MACS 6696	23	82.9	83.3	84.6	83.0	82.3	**83.2**	85.1	81.9	78.8	82.3	**82.0**
24	MP 1332	24	84.4	83.2	78.8	82.7	82.2	**82.3**	85.2	81.5	79.0	85.6	**82.8**
25	K 1615	25	84.2	83.0	82.1	83.2	83.0	**83.1**	85.6	82.3	80.9	85.5	**83.6**
26	HD 3275	26	82.8	82.1	83.2	83.3	81.4	**82.6**	83.7	81.4	79.3	84.8	**82.3**
27	HP 1967	27	84.4	84.6	80.3	84.0	83.3	**83.3**	83.8	82.7	80.5	86.1	**83.3**
28	MP 1333	28	83.4	84.4	82.8	83.1	82.2	**83.2**	83.0	80.4	80.5	85.1	**82.3**
29	HD 2888(C)	29	82.7	82.8	80.8	83.7	83.3	**82.7**	81.8	82.8	83.5	87.0	**83.8**
30	MACS 6695	30	82.7	83.5	80.5	83.4	84.0	**82.8**	85.0	82.4	78.7	84.4	**82.6**
31	BRW 3806	31	83.7	83.8	81.3	82.2	81.8	**82.6**	82.3	80.7	77.5	81.8	**80.6**
32	NW 7008	32	82.2	85.4	80.3	84.2	81.0	**82.6**	83.4	80.4	79.7	83.8	**81.8**
33	UAS 395	33	81.2	79.0	80.0	82.7	80.6	**80.7**	82.2	81.4	78.2	80.3	**80.5**
34	UAS 394	34	82.2	83.5	82.8	83.0	83.2	**82.9**	84.6	81.6	81.7	84.8	**83.2**
35	PBW 776	35	81.5	81.6	84.1	85.7	80.9	**82.8**	85.0	81.8	79.2	86.5	**83.1**
36	WH 1235	36	82.1	83.9	81.1	82.7	83.5	**82.7**	83.1	81.3	80.2	87.0	**82.9**
	Mean		**83.4**	**83.2**	**82.0**	**83.5**	**82.4**	**82.9**	**84.0**	**81.7**	**79.6**	**84.6**	**82.5**

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Table 30: Test Weight (kg/hl) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	CZ					PZ			Mean	Overall mean
			Indore	Kota	Junagrh	Vijapur	Mean	Pune	Dharwad	Niphad		
1	WH 1142(C)	01	85.5	85.6	84.1	82.1	**84.3**	78.7	79.6	81.2	**79.8**	**82.9**
2	JWS 151	02	85.1	85.5	85.2	83.6	**84.9**	77.3	82.5	80.4	**80.0**	**82.3**
3	NIAW 3170	03	84.5	83.3	81.3	82.3	**82.8**	76.8	77.2	79.4	**77.8**	**80.9**
4	DBW 252	04	83.1	84.1	83.8	81.4	**83.1**	76.3	80.8	78.7	**78.6**	**81.6**
5	UP 2989	05	86.0	86.0	84.0	83.0	**84.8**	81.5	83.5	84.3	**83.1**	**83.8**
6	BRW 3798	06	85.4	85.8	86.4	83.2	**85.2**	82.9	82.5	83.6	**83.0**	**83.7**
7	WH 1236	07	83.6	82.5	81.7	81.3	**82.3**	75.1	78.3	81.9	**78.4**	**81.6**
8	DBW 245	08	83.9	83.5	84.4	81.5	**83.3**	75.0	80.7	78.9	**78.2**	**81.3**
9	NIAW 3217	09	86.3	85.6	84.2	83.1	**84.8**	79.3	81.3	82.8	**81.1**	**83.2**
10	HI 1628	10	83.0	84.8	85.5	83.3	**84.2**	76.6	76.3	81.1	**78.0**	**81.7**
11	DBW 93(C)	11	84.6	84.0	83.7	84.5	**84.2**	80.5	79.9	80.9	**80.4**	**83.0**
12	CG 1027	12	83.1	83.7	82.6	82.8	**83.1**	75.4	76.2	79.6	**77.0**	**81.3**
13	MP 1331	13	83.9	85.9	84.4	84.2	**84.6**	77.5	79.2	82.1	**79.6**	**82.4**
14	DBW 110(C)	14	82.3	83.5	83.6	81.3	**82.7**	80.8	76.5	79.0	**78.7**	**81.4**
15	MP 3475	15	86.8	84.7	85.3	84.0	**85.2**	82.6	84.0	84.6	**83.7**	**84.3**
16	MP 1334	16	82.3	83.7	80.3	79.1	**81.3**	75.0	76.8	75.4	**75.7**	**80.1**
17	K 1616	17	83.5	86.0	83.1	84.2	**84.2**	83.3	77.6	82.8	**81.2**	**83.3**
18	DBW 244	18	83.2	83.3	83.2	83.1	**83.2**	77.1	81.1	80.5	**79.6**	**81.7**
19	PBW 775	19	83.7	84.4	83.3	82.2	**83.4**	78.4	81.3	82.2	**80.6**	**82.6**
20	HD 3273	20	82.1	83.9	81.8	80.7	**82.1**	75.7	76.0	78.8	**76.8**	**80.8**
21	UP 2988	21	85.0	86.0	83.4	83.1	**84.4**	78.3	81.5	82.4	**80.7**	**83.2**
22	HD 3274	22	82.8	84.7	84.6	77.3	**82.4**	75.7	78.5	80.9	**78.3**	**81.4**
23	MACS 6696	23	85.1	84.6	83.1	84.7	**84.4**	82.9	82.0	83.8	**82.9**	**83.1**
24	MP 1332	24	84.9	84.7	83.1	82.7	**83.9**	79.3	81.0	83.5	**81.3**	**82.5**
25	K 1615	25	85.0	85.4	83.0	83.2	**84.2**	82.1	82.6	84.5	**83.1**	**83.5**
26	HD 3275	26	83.2	82.7	81.9	82.6	**82.6**	79.2	81.2	82.2	**80.8**	**82.1**
27	HP 1967	27	84.2	86.0	84.5	84.6	**84.8**	80.8	81.4	82.1	**81.4**	**83.2**
28	MP 1333	28	83.0	85.5	82.4	78.9	**82.5**	74.4	78.7	79.1	**77.4**	**81.3**
29	HD 2888(C)	29	86.2	87.0	85.7	85.2	**86.0**	81.2	83.7	83.6	**82.8**	**83.8**
30	MACS 6695	30	85.2	84.0	83.2	84.5	**84.2**	82.2	81.0	81.6	**81.6**	**82.8**
31	BRW 3806	31	81.9	81.5	81.2	82.0	**81.7**	74.0	76.9	77.5	**76.1**	**80.2**
32	NW 7008	32	83.2	84.0	84.1	82.5	**83.5**	77.6	78.3	78.7	**78.2**	**81.5**
33	UAS 395	33	80.1	84.2	79.3	77.3	**80.2**	73.1	73.3	77.2	**74.5**	**79.0**
34	UAS 394	34	84.2	83.4	82.6	81.1	**82.8**	76.9	79.3	80.9	**79.0**	**82.0**
35	PBW 776	35	84.8	84.4	83.4	82.8	**83.9**	80.0	80.5	79.1	**79.8**	**82.4**
36	WH 1235	36	83.5	85.0	83.1	85.0	**84.1**	76.8	82.0	82.7	**80.5**	**82.5**
	Mean		**84.0**	**84.5**	**83.3**	**82.5**	**83.6**	**78.3**	**79.8**	**81.0**	**79.7**	**82.2**

Table 31: Protein Content (%) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	NWPZ						NEPZ				
			Hisar	Ludhiana	Delhi	Pantnagar	Durgapur	Mean	Kanpur	Pusa	Sabour	Varanasi	Mean
1	WH 1142(C)	01	10.00	11.48	14.30	10.39	11.87	**11.61**	11.44	10.56	10.86	9.15	**10.50**
2	JWS 151	02	10.08	12.68	12.46	12.97	11.65	**11.97**	13.57	11.52	11.28	10.16	**11.63**
3	NIAW 3170	03	11.05	11.75	13.32	11.63	11.88	**11.93**	13.10	11.92	11.16	9.95	**11.53**
4	DBW 252	04	10.35	11.89	11.71	10.82	12.33	**11.42**	11.02	11.13	10.75	9.97	**10.72**
5	UP 2989	05	10.62	12.82	12.19	12.00	12.27	**11.98**	12.60	10.36	11.44	9.82	**11.06**
6	BRW 3798	06	10.79	12.81	12.95	10.77	11.72	**11.81**	13.72	11.84	11.39	9.74	**11.67**
7	WH 1236	07	10.00	10.99	12.91	11.37	12.83	**11.62**	12.68	11.46	10.58	9.93	**11.16**
8	DBW 245	08	11.31	12.04	10.72	11.41	12.73	**11.64**	12.13	11.79	11.26	9.33	**11.13**
9	NIAW 3217	09	11.16	13.10	12.81	11.36	11.65	**12.02**	14.59	12.44	11.14	9.94	**12.03**
10	HI 1628	10	10.57	11.36	12.94	10.14	12.00	**11.40**	12.19	10.88	10.51	9.89	**10.87**
11	DBW 93(C)	11	10.83	12.46	12.71	11.62	12.65	**12.05**	13.40	12.46	11.08	10.36	**11.83**
12	CG 1027	12	10.00	10.59	10.94	10.02	13.60	**11.03**	10.58	10.61	10.00	9.05	**10.06**
13	MP 1331	13	10.01	12.80	13.55	10.00	13.19	**11.91**	11.16	10.15	10.83	9.63	**10.44**
14	DBW 110(C)	14	10.12	11.83	11.81	10.43	11.16	**11.07**	11.18	10.59	10.00	9.41	**10.30**
15	MP 3475	15	10.93	12.56	13.00	11.52	12.97	**12.20**	11.85	11.58	12.09	9.81	**11.33**
16	MP 1334	16	10.18	12.03	12.63	11.08	13.03	**11.79**	12.77	10.94	10.56	9.89	**11.04**
17	K 1616	17	11.36	12.60	13.09	11.92	14.78	**12.75**	12.73	12.85	11.44	10.04	**11.77**
18	DBW 244	18	10.29	12.49	14.04	11.83	13.50	**12.43**	12.70	12.14	12.41	10.44	**11.92**
19	PBW 775	19	10.02	12.61	13.03	11.04	12.76	**11.89**	10.77	11.28	10.37	10.79	**10.80**
20	HD 3273	20	10.00	10.90	14.31	10.00	11.72	**11.39**	10.05	10.18	10.00	10.70	**10.23**
21	UP 2988	21	10.87	12.92	13.39	10.42	14.39	**12.40**	14.98	12.88	10.94	10.44	**12.31**
22	HD 3274	22	10.00	11.45	14.25	11.00	13.66	**12.07**	10.86	11.04	10.26	10.35	**10.63**
23	MACS 6696	23	10.00	11.12	12.72	11.05	12.88	**11.55**	11.83	11.72	10.83	9.58	**10.99**
24	MP 1332	24	10.72	11.74	13.44	11.15	13.30	**12.07**	11.70	11.80	10.97	9.47	**10.99**
25	K 1615	25	10.12	12.26	12.23	11.59	14.75	**12.19**	11.81	11.79	11.08	10.40	**11.27**
26	HD 3275	26	10.21	11.73	13.89	11.97	15.04	**12.57**	12.12	12.53	10.95	10.71	**11.58**
27	HP 1967	27	11.05	11.51	12.46	11.55	12.94	**11.90**	11.65	11.92	10.71	9.51	**10.95**
28	MP 1333	28	10.20	11.26	11.38	10.00	12.07	**10.98**	11.41	10.94	10.88	9.79	**10.76**
29	HD 2888(C)	29	10.07	12.71	13.43	11.87	10.79	**11.77**	10.75	11.91	10.16	9.99	**10.70**
30	MACS 6695	30	10.00	11.12	12.75	10.65	10.99	**11.10**	11.61	10.65	10.02	9.55	**10.46**
31	BRW 3806	31	10.22	10.44	11.38	10.00	14.91	**11.39**	10.39	10.21	10.00	9.67	**10.07**
32	NW 7008	32	10.15	11.30	13.43	10.30	12.78	**11.59**	11.55	10.35	10.00	9.40	**10.33**
33	UAS 395	33	10.00	10.62	12.75	10.00	12.28	**11.13**	10.22	10.17	10.22	9.54	**10.04**
34	UAS 394	34	10.05	11.14	11.38	10.23	12.35	**11.03**	11.61	11.06	10.09	9.15	**10.48**
35	PBW 776	35	10.00	12.53	13.74	10.00	13.77	**12.01**	10.28	11.31	10.63	9.19	**10.35**
36	WH 1235	36	11.00	11.88	12.09	11.33	14.02	**12.06**	12.33	10.81	10.47	10.29	**10.98**
	Mean		**10.40**	**11.88**	**12.78**	**10.98**	**12.81**	**11.77**	**11.93**	**11.33**	**10.76**	**9.86**	**10.97**

Cont….

Table 31: Protein Content (%) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	CZ					PZ			Mean	Overall mean
			Indore	Kota	Junagrh	Vijapur	Mean	Pune	Dharwad	Niphad		
1	WH 1142(C)	01	10.02	10.20	12.25	13.99	**11.62**	13.09	13.70	12.85	**13.21**	**11.73**
2	JWS 151	02	10.26	10.57	13.29	13.22	**11.84**	13.86	13.71	12.89	**13.49**	**12.23**
3	NIAW 3170	03	11.28	11.52	13.23	13.40	**12.36**	13.48	13.25	12.75	**13.16**	**12.24**
4	DBW 252	04	11.69	10.00	12.94	13.94	**12.14**	13.67	13.72	13.37	**13.59**	**11.97**
5	UP 2989	05	11.82	10.97	13.31	12.52	**12.16**	13.82	12.50	11.77	**12.70**	**11.97**
6	BRW 3798	06	11.50	11.88	13.94	13.92	**12.81**	13.73	12.88	13.45	**13.35**	**12.41**
7	WH 1236	07	10.13	10.48	13.09	13.34	**11.76**	13.63	12.37	12.65	**12.88**	**11.86**
8	DBW 245	08	10.77	10.27	10.66	13.53	**11.31**	13.40	13.64	12.33	**13.12**	**11.80**
9	NIAW 3217	09	11.13	11.86	13.28	13.94	**12.55**	13.35	12.12	11.77	**12.41**	**12.25**
10	HI 1628	10	10.03	10.01	12.79	13.00	**11.46**	13.25	12.04	11.78	**12.36**	**11.52**
11	DBW 93(C)	11	11.53	10.00	13.10	13.63	**12.07**	12.91	12.45	13.06	**12.81**	**12.19**
12	CG 1027	12	10.01	11.08	13.76	12.66	**11.88**	13.10	12.81	12.56.	**12.96**	**11.48**
13	MP 1334	13	12.34	10.48	12.41	13.43	**12.17**	13.56	13.76	12.92	**13.41**	**11.98**
14	DBW 110(C)	14	9.86	12.10	13.80	13.82	**12.40**	13.94	13.00	11.87	**12.94**	**11.67**
15	MP 3475	15	11.61	11.28	12.82	13.24	**12.24**	12.42	14.63	11.94	**13.00**	**12.19**
16	MP 1331	16	11.15	12.08	13.53	13.99	**12.69**	14.02	13.26	13.32	**13.53**	**12.26**
17	K 1616	17	13.37	13.03	12.72	13.85	**13.24**	14.46	13.82	12.73	**13.67**	**12.86**
18	DBW 244	18	11.20	11.89	12.39	13.42	**12.23**	14.80	12.29	13.37	**13.49**	**12.52**
19	PBW 775	19	10.96	10.64	13.30	13.75	**12.16**	13.28	12.67	13.11	**13.02**	**11.97**
20	HD 3273	20	10.99	11.68	13.36	13.11	**12.29**	13.42	13.54	12.08	**13.01**	**11.73**
21	UP 2988	21	11.66	12.09	13.06	13.89	**12.68**	14.63	13.52	12.90	**13.68**	**12.77**
22	HD 3274	22	10.86	12.27	13.13	13.70	**12.49**	13.84	13.08	13.72	**13.55**	**12.18**
23	MACS 6696	23	10.52	10.83	12.96	13.18	**11.87**	13.89	13.43	11.88	**13.07**	**11.87**
24	MP 1332	24	10.48	11.20	12.60	13.62	**11.98**	13.47	13.30	13.82	**13.53**	**12.14**
25	K 1615	25	11.65	12.27	13.39	13.77	**12.77**	13.38	14.10	11.79	**13.09**	**12.33**
26	HD 3275	26	10.87	12.59	13.38	13.06	**12.48**	13.81	13.18	12.92	**13.30**	**12.48**
27	HP 1967	27	11.40	11.38	13.46	13.28	**12.38**	12.83	13.15	12.13	**12.70**	**11.98**
28	MP 1333	28	11.26	11.03	13.98	13.90	**12.54**	14.07	13.31	13.26	**13.55**	**11.96**
29	HD 2888(C)	29	13.13	11.11	13.52	13.13	**12.72**	13.25	14.88	13.48	**13.87**	**12.27**
30	MACS 6695	30	10.57	10.00	12.19	14.14	**11.73**	13.64	14.23	12.36	**13.41**	**11.67**
31	BRW 3806	31	10.09	10.47	13.68	12.29	**11.63**	13.67	13.10	12.08.	**13.39**	**11.62**
32	NW 7008	32	9.14	10.00	13.28	13.27	**11.42**	14.38	13.97	11.34	**13.23**	**11.64**
33	UAS 395	33	10.92	10.53	13.04	13.67	**12.04**	13.78	14.55	12.07	**13.47**	**11.67**
34	UAS 394	34	10.08	11.03	12.61	13.95	**11.92**	13.85	14.40	13.25	**13.83**	**11.81**
35	PBW 776	35	10.90	11.57	13.12	14.22	**12.45**	13.56	14.31	13.32	**13.73**	**12.14**
36	WH 1235	36	11.10	10.94	12.25	13.28	**11.89**	13.61	14.38	13.19	**13.73**	**12.16**
	Mean		**11.01**	**11.15**	**13.05**	**13.50**	**12.18**	**13.63**	**13.42**	**12.69**	**13.25**	**12.04**

Table 32: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	NWPZ						NEPZ				
			Hisar	Ludhiana	Delhi	Pantnagar	Durgapur	Mean	Kanpur	Pusa	Sabour	Varanasi	Mean
1	WH 1142(C)	01	30	35	31	31	39	**33**	32	44	41	30	**37**
2	JWS 151	02	30	37	37	30	41	**35**	31	45	37	30	**36**
3	NIAW 3170	03	34	36	35	38	50	**39**	35	58	36	40	**42**
4	DBW 252	04	36	48	45	40	55	**45**	40	56	54	41	**48**
5	UP 2989	05	30	34	47	36	44	**38**	30	48	44	31	**38**
6	BRW 3798	06	31	49	30	46	48	**41**	42	56	55	39	**48**
7	WH 1236	07	33	34	41	32	36	**35**	30	44	42	35	**38**
8	DBW 245	08	35	44	30	42	48	**40**	35	60	37	40	**43**
9	NIAW 3217	09	43	41	45	39	40	**42**	32	59	54	41	**47**
10	HI 1628	10	39	47	34	37	56	**43**	36	48	44	38	**42**
11	DBW 93(C)	11	30	37	33	34	41	**35**	30	44	39	34	**37**
12	CG 1027	12	44	45	30	39	49	**41**	31	47	44	35	**39**
13	MP 1334	13	43	41	32	36	51	**41**	34	46	48	42	**43**
14	DBW 110(C)	14	36	39	35	38	43	**38**	30	43	39	36	**37**
15	MP 3475	15	39	37	30	39	49	**39**	31	46	42	34	**38**
16	MP 1331	16	30	30	37	30	40	**33**	30	46	31	30	**34**
17	K 1616	17	45	39	39	39	44	**41**	31	42	41	37	**38**
18	DBW 244	18	45	44	40	42	52	**45**	39	48	48	43	**45**
19	PBW 775	19	35	45	39	39	50	**42**	43	50	42	46	**45**
20	HD 3273	20	33	46	32	40	52	**41**	44	55	43	42	**46**
21	UP 2988	21	45	39	33	39	41	**39**	40	54	45	40	**45**
22	HD 3274	22	30	51	30	48	53	**42**	50	53	50	46	**50**
23	MACS 6696	23	38	43	34	44	58	**43**	45	51	49	43	**47**
24	MP 1332	24	40	42	33	43	51	**42**	40	47	48	37	**43**
25	K 1615	25	30	30	40	30	40	**34**	30	38	30	30	**32**
26	HD 3275	26	38	32	34	33	33	**34**	34	36	33	38	**35**
27	HP 1967	27	39	40	30	44	48	**40**	42	54	44	40	**45**
28	MP 1333	28	45	44	30	38	44	**40**	44	50	42	43	**45**
29	HD 2888(C)	29	36	40	37	36	57	**41**	32	41	39	37	**37**
30	MACS 6695	30	40	46	35	43	43	**41**	43	49	47	40	**45**
31	BRW 3806	31	39	50	38	46	49	**44**	44	56	48	42	**48**
32	NW 7008	32	45	40	35	35	50	**41**	36	44	40	36	**39**
33	UAS 395	33	43	44	43	42	47	**44**	42	51	42	40	**44**
34	UAS 394	34	35	38	35	33	49	**38**	38	47	38	43	**42**
35	PBW 776	35	48	40	37	47	50	**44**	40	54	42	42	**45**
36	WH 1235	36	50	46	36	46	47	**45**	42	58	46	35	**45**
	Mean		**38**	**41**	**36**	**39**	**47**	**40**	**37**	**49**	**43**	**38**	**42**

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Table 32: Sedimentation Value (ml) of *T.aestivum* genotypes in NIVT-5A

Sr. No.	Entries	Trial Code	CZ					PZ			Mean	Overall mean
			Indore	Kota	Junagrh	Vijapur	Mean	Pune	Dharwad	Niphad		
1	WH 1142(C)	01	30	42	30	37	**35**	39	40	34	**38**	**36**
2	JWS 151	02	33	36	33	47	**37**	42	45	32	**40**	**37**
3	NIAW 3170	03	35	51	34	45	**41**	48	52	35	**45**	**42**
4	DBW 252	04	36	45	32	47	**40**	49	55	36	**47**	**45**
5	UP 2989	05	30	43	30	52	**39**	39	46	30	**38**	**38**
6	BRW 3798	06	35	52	36	50	**43**	52	49	33	**45**	**44**
7	WH 1236	07	40	48	30	42	**40**	37	45	30	**37**	**38**
8	DBW 245	08	30	57	31	39	**39**	42	48	30	**40**	**41**
9	NIAW 3217	09	37	47	40	44	**42**	44	55	30	**43**	**43**
10	HI 1628	10	30	52	36	55	**43**	45	52	36	**44**	**43**
11	DBW 93(C)	11	33	32	33	43	**35**	37	44	31	**37**	**36**
12	CG 1027	12	40	47	34	55	**44**	41	55	35	**44**	**42**
13	MP 1334	13	35	46	35	35	**38**	36	38	35	**36**	**39**
14	DBW 110(C)	14	30	43	38	38	**37**	35	48	37	**40**	**38**
15	MP 3475	15	40	45	37	37	**40**	36	50	36	**41**	**39**
16	MP 1331	16	35	36	30	30	**33**	30	35	30	**32**	**33**
17	K 1616	17	36	49	30	34	**37**	31	40	34	**35**	**38**
18	DBW 244	18	41	51	40	36	**42**	39	55	42	**45**	**44**
19	PBW 775	19	46	45	34	34	**40**	37	43	39	**40**	**42**
20	HD 3273	20	40	50	38	39	**42**	38	46	41	**42**	**43**
21	UP 2988	21	42	44	30	31	**37**	33	40	38	**37**	**39**
22	HD 3274	22	34	50	31	42	**39**	43	50	44	**46**	**44**
23	MACS 6696	23	45	52	33	33	**41**	37	52	36	**42**	**43**
24	MP 1332	24	42	45	31	33	**38**	36	42	39	**39**	**40**
25	K 1615	25	39	32	32	30	**33**	30	37	32	**33**	**33**
26	HD 3275	26	32	37	30	31	**33**	31	38	50	**40**	**35**
27	HP 1967	27	37	49	38	35	**40**	32	45	44	**40**	**41**
28	MP 1333	28	44	48	40	40	**43**	38	48	37	**41**	**42**
29	HD 2888(C)	29	42	43	32	39	**39**	36	45	42	**41**	**40**
30	MACS 6695	30	41	47	34	35	**39**	39	48	44	**44**	**42**
31	BRW 3806	31	42	50	48	38	**45**	42	49	45	**45**	**45**
32	NW 7008	32	45	42	35	35	**39**	43	50	42	**45**	**41**
33	UAS 395	33	40	49	40	40	**42**	40	42	40	**41**	**43**
34	UAS 394	34	45	41	39	45	**43**	36	45	48	**43**	**41**
35	PBW 776	35	40	50	42	42	**44**	40	41	41	**41**	**43**
36	WH 1235	36	45	51	48	44	**47**	48	48	44	**47**	**46**
	Mean		**38**	**46**	**35**	**40**	**40**	**39**	**46**	**38**	**41**	**41**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	8.5	8.0	**8.3**	8.0	8.0	8.0	7.5	**7.9**	**8.1**
2	MPO 1336	02	7.5	7.5	**7.5**	8.5	8.0	7.5	7.5	**7.9**	**7.7**
3	HI 8804	03	8.5	8.5	**8.5**	7.5	8.0	8.0	8.0	**7.9**	**8.2**
4	GW 1343	04	8.0	7.5	**7.8**	8.0	8.0	8.0	7.5	**7.9**	**7.8**
5	UAS 466	05	8.5	7.0	**7.8**	7.0	8.8	7.5	7.0	**7.6**	**7.7**
6	NIDW 1099	06	7.5	6.0	**6.8**	6.5	7.5	7.0	6.5	**6.9**	**6.8**
7	DDW 45	07	7.5	7.5	**7.5**	6.5	7.5	7.5	7.0	**7.1**	**7.3**
8	MPO 1335	08	6.5	5.5	**6.0**	6.5	7.2	7.5	6.0	**6.8**	**6.4**
9	HI 8805	09	8.0	7.5	**7.8**	8.0	9.0	8.0	7.5	**8.1**	**7.9**
10	MACS 4059	10	8.0	7.0	**7.5**	7.5	8.0	8.0	7.0	**7.6**	**7.6**
11	UAS 467	11	8.0	8.0	**8.0**	7.0	8.0	7.5	7.0	**7.4**	**7.7**
12	GW 1346	12	8.0	7.0	**7.5**	7.5	8.0	7.0	7.0	**7.4**	**7.4**
13	MACS 4063	13	8.5	7.5	**8.0**	8.0	8.8	8.0	7.0	**8.0**	**8.0**
14	NIDW 1113	14	7.5	6.5	**7.0**	6.5	7.5	7.0	5.5	**6.6**	**6.8**
15	GW 1347	15	7.5	6.0	**6.8**	7.5	7.0	8.0	7.5	**7.5**	**7.1**
16	AKDW 2997-16(C)	16	7.5	6.5	**7.0**	7.0	8.2	7.0	7.0	**7.3**	**7.2**
17	DDW 46	17	7.0	6.0	**6.5**	6.5	7.0	6.5	6.0	**6.5**	**6.5**
18	HI 8806	18	8.0	7.0	**7.5**	7.5	8.0	8.0	7.0	**7.6**	**7.6**
19	HI 8803	19	8.5	7.0	**7.8**	7.5	9.0	8.0	7.5	**8.0**	**7.9**
20	HI 8627(C)	20	8.0	7.5	**7.8**	7.0	8.0	7.5	7.0	**7.4**	**7.6**
21	HI 8802	21	8.0	8.5	**8.3**	7.0	8.0	8.0	7.5	**7.6**	**7.9**
22	MACS 4062	22	8.5	7.5	**8.0**	8.0	8.0	9.0	7.5	**8.1**	**8.1**
23	DDW 47	23	7.0	5.5	**6.3**	7.0	6.5	7.5	5.5	**6.6**	**6.4**
24	AKDW 4896	24	8.5	7.0	**7.8**	8.5	8.5	9.0	7.0	**8.3**	**8.0**
25	GW 1344	25	7.5	6.0	**6.8**	8.5	7.5	8.0	7.0	**7.8**	**7.3**
	Mean		**7.9**	**7.0**	**7.4**	**7.4**	**7.9**	**7.7**	**7.0**	**7.5**	**7.5**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	87.6	81.5	**84.5**	81.9	83.9	85.3	83.6	**83.7**	**84.1**
2	MPO 1336	02	77.4	84.6	**81.0**	85.0	87.0	84.9	84.5	**85.3**	**83.2**
3	HI 8804	03	87.3	85.1	**86.2**	83.5	87.3	85.0	83.5	**84.8**	**85.5**
4	GW 1343	04	78.9	76.6	**77.8**	71.9	77.4	77.9	73.9	**75.2**	**76.5**
5	UAS 466	05	88.6	86.1	**87.4**	84.3	87.1	85.2	84.0	**85.1**	**86.3**
6	NIDW 1099	06	87.0	86.8	**86.9**	80.2	86.4	84.0	80.2	**82.7**	**84.8**
7	DDW 45	07	89.1	86.8	**88.0**	83.1	84.9	86.2	84.0	**84.5**	**86.3**
8	MPO 1335	08	86.9	87.9	**87.4**	81.3	84.2	82.3	80.9	**82.2**	**84.8**
9	HI 8805	09	88.4	84.8	**86.6**	83.0	85.2	85.1	85.2	**84.6**	**85.6**
10	MACS 4059	10	84.8	84.9	**84.8**	82.7	84.1	85.2	84.3	**84.1**	**84.5**
11	UAS 467	11	84.7	83.8	**84.2**	78.2	83.5	81.8	79.8	**80.8**	**82.5**
12	GW 1346	12	86.1	79.4	**82.8**	76.5	81.1	79.7	78.2	**78.9**	**80.8**
13	MACS 4063	13	87.1	84.2	**85.6**	81.9	84.1	83.7	81.7	**82.9**	**84.3**
14	NIDW 1113	14	86.8	86.3	**86.6**	81.5	85.9	82.2	80.2	**82.4**	**84.5**
15	GW 1347	15	82.7	75.6	**79.1**	72.0	73.7	74.1	72.0	**73.0**	**76.1**
16	AKDW 2997-16(C)	16	87.0	84.7	**85.8**	81.1	85.0	83.1	82.1	**82.8**	**84.3**
17	DDW 46	17	84.9	84.5	**84.7**	81.1	83.2	83.1	77.4	**81.2**	**82.9**
18	HI 8806	18	89.7	88.0	**88.9**	85.4	87.2	87.6	83.5	**85.9**	**87.4**
19	HI 8803	19	87.7	86.1	**86.9**	81.3	84.5	84.6	81.7	**83.0**	**85.0**
20	HI 8627(C)	20	88.9	85.7	**87.3**	82.5	84.5	82.6	81.6	**82.8**	**85.1**
21	HI 8802	21	88.5	85.2	**86.8**	82.6	86.1	85.0	83.4	**84.3**	**85.5**
22	MACS 4062	22	85.0	82.9	**83.9**	80.8	82.9	82.4	82.0	**82.0**	**83.0**
23	DDW 47	23	86.0	84.4	**85.2**	79.2	85.4	83.1	80.9	**82.1**	**83.7**
24	AKDW 4896	24	86.8	84.4	**85.6**	84.1	85.1	85.0	83.8	**84.5**	**85.1**
25	GW 1344	25	83.8	78.5	**81.2**	75.5	80.6	82.2	78.6	**79.2**	**80.2**
	Mean		**86.1**	**84.0**	**85.0**	**80.8**	**84.0**	**83.2**	**81.2**	**82.3**	**83.7**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	11.20	10.80	**11.00**	15.16	14.66	12.92	14.92	**14.42**	**12.71**
2	MPO 1336	02	12.89	11.80	**12.35**	15.27	14.91	13.38	14.17	**14.43**	**13.39**
3	HI 8804	03	12.24	11.18	**11.71**	17.08	12.73	13.83	17.69	**15.33**	**13.52**
4	GW 1343	04	12.84	13.04	**12.94**	15.07	15.95	14.79	14.67	**15.12**	**14.03**
5	UAS 466	05	10.61	10.65	**10.63**	15.59	13.84	13.10	15.44	**14.49**	**12.56**
6	NIDW 1099	06	10.37	9.88	**10.13**	16.77	13.06	13.91	16.38	**15.03**	**12.58**
7	DDW 45	07	10.90	11.05	**10.98**	16.84	15.36	14.38	15.16	**15.44**	**13.21**
8	MPO 1335	08	12.05	11.27	**11.66**	17.11	14.08	14.35	16.40	**15.49**	**13.57**
9	HI 8805	09	12.06	10.93	**11.50**	16.17	13.40	13.02	14.41	**14.25**	**12.87**
10	MACS 4059	10	14.10	11.56	**12.83**	17.43	17.67	16.33	16.37	**16.95**	**14.89**
11	UAS 467	11	11.75	11.05	**11.40**	16.82	12.82	14.55	17.69	**15.47**	**13.44**
12	GW 1346	12	12.03	11.13	**11.58**	15.19	13.28	13.62	14.34	**14.11**	**12.84**
13	MACS 4063	13	12.08	12.42	**12.25**	15.45	16.13	13.88	15.17	**15.16**	**13.70**
14	NIDW 1113	14	11.38	10.23	**10.81**	15.86	13.62	13.41	17.09	**15.00**	**12.90**
15	GW 1347	15	10.92	12.94	**11.93**	15.33	14.43	14.12	15.01	**14.72**	**13.33**
16	AKDW 2997-16(C)	16	10.61	11.11	**10.86**	16.36	13.28	13.20	14.01	**14.21**	**12.54**
17	DDW 46	17	11.36	10.50	**10.93**	17.49	14.25	14.46	16.95	**15.79**	**13.36**
18	HI 8806	18	11.79	10.34	**11.07**	16.05	13.95	13.18	15.46	**14.66**	**12.86**
19	HI 8803	19	12.26	9.65	**10.96**	14.91	13.30	12.52	14.14	**13.72**	**12.34**
20	HI 8627(C)	20	11.72	11.68	**11.70**	15.72	13.95	13.96	16.33	**14.99**	**13.35**
21	HI 8802	21	11.75	11.46	**11.61**	16.32	13.92	14.06	16.99	**15.32**	**13.46**
22	MACS 4062	22	12.78	13.39	**13.09**	15.56	15.38	13.88	15.37	**15.05**	**14.07**
23	DDW 47	23	11.70	10.82	**11.26**	17.17	14.08	14.44	17.92	**15.90**	**13.58**
24	AKDW 4896	24	12.48	11.54	**12.01**	14.71	14.87	14.24	14.23	**14.51**	**13.26**
25	GW 1344	25	12.41	12.82	**12.62**	17.52	14.97	13.54	15.53	**15.39**	**14.00**
	Mean		**11.85**	**11.33**	**11.59**	**16.12**	**14.32**	**13.88**	**15.67**	**15.00**	**13.29**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	29	30	**30**	35	30	30	32	**32**	**31**
2	MPO 1336	02	37	25	**31**	24	22	23	29	**25**	**28**
3	HI 8804	03	31	31	**31**	29	27	30	27	**28**	**30**
4	GW 1343	04	34	37	**36**	39	34	34	39	**37**	**36**
5	UAS 466	05	29	32	**31**	34	27	31	32	**31**	**31**
6	NIDW 1099	06	35	36	**36**	38	35	36	37	**37**	**36**
7	DDW 45	07	38	43	**41**	38	36	35	38	**37**	**39**
8	MPO1335	08	25	27	**26**	25	25	25	26	**25**	**26**
9	HI 8805	09	36	37	**37**	35	32	30	33	**33**	**35**
10	MACS 4059	10	37	37	**37**	40	32	33	35	**35**	**36**
11	UAS 467	11	36	32	**34**	39	34	32	33	**35**	**34**
12	GW 1346	12	23	27	**25**	29	23	26	27	**26**	**26**
13	MACS 4063	13	31	35	**33**	34	29	28	32	**31**	**32**
14	NIDW 1113	14	40	42	**41**	40	41	36	35	**38**	**40**
15	GW 1347	15	25	38	**32**	41	34	35	36	**37**	**34**
16	AKDW 2997-16(C)	16	30	33	**32**	35	26	30	33	**31**	**31**
17	DD W46	17	45	43	**44**	40	42	37	40	**40**	**42**
18	HI 8806	18	35	38	**37**	39	31	31	32	**33**	**35**
19	HI 8803	19	34	36	**35**	35	29	32	34	**33**	**34**
20	HI 8627(C)	20	25	31	**28**	33	28	28	30	**30**	**29**
21	HI 8802	21	31	32	**32**	34	32	33	33	**33**	**32**
22	MACS 4062	22	21	28	**25**	27	18	23	22	**23**	**24**
23	DDW 47	23	36	37	**37**	39	34	34	35	**36**	**36**
24	AKDW 4896	24	21	26	**24**	27	20	22	24	**23**	**23**
25	GW 1344	25	19	19	**19**	24	19	21	23	**22**	**20**
	Mean		**31**	**33**	**32**	**34**	**30**	**30**	**32**	**31**	**32**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	4	6	**5**	0	1	0	0	**0**	**3**
2	MPO 1336	02	21	8	**15**	0	0	0	10	**3**	**9**
3	HI 8804	03	2	33	**18**	0	0	0	3	**1**	**9**
4	GW 1343	04	3	1	**2**	0	0	0	0	**0**	**1**
5	UAS 466	05	4	4	**4**	0	3	0	0	**1**	**2**
6	NIDW 1099	06	9	34	**22**	0	0	2	2	**1**	**11**
7	DDW 45	07	30	33	**32**	0	1	5	3	**2**	**17**
8	MPO 1335	08	1	36	**19**	0	0	0	0	**0**	**9**
9	HI 8805	09	7	11	**9**	0	0	7	4	**3**	**6**
10	MACS 4059	10	2	10	**6**	0	1	1	0	**1**	**3**
11	UAS 467	11	3	9	**6**	0	1	4	2	**2**	**4**
12	GW 1346	12	8	10	**9**	0	1	3	0	**1**	**5**
13	MACS 4063	13	8	5	**7**	2	0	0	8	**3**	**5**
14	NIDW 1113	14	20	50	**35**	1	10	4	0	**4**	**19**
15	GW 1347	15	15	6	**11**	1	0	5	1	**2**	**6**
16	AKDW 2997-16(C)	16	25	9	**17**	0	1	0	6	**2**	**9**
17	DDW 46	17	21	48	**35**	0	1	2	0	**1**	**18**
18	HI 8806	18	4	30	**17**	0	9	1	0	**3**	**10**
19	HI 8803	19	3	66	**35**	0	3	3	0	**2**	**18**
20	HI 8627(C)	20	0	3	**2**	0	2	1	0	**1**	**1**
21	HI 8802	21	0	2	**1**	1	1	9	3	**4**	**2**
22	MACS 4062	22	0	7	**4**	0	0	5	2	**2**	**3**
23	DDW 47	23	1	27	**14**	0	0	7	0	**2**	**8**
24	AKDW4 896	24	10	38	**24**	1	0	5	1	**2**	**13**
25	GW 1344	25	23	58	**41**	0	3	10	0	**3**	**22**
	Mean		**9**	**22**	**15**	**0**	**2**	**3**	**2**	**2**	**8**

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

Sr. No.	Entry	Trial Code	CZ			PZ					Overall Mean
			Indore	Kota	Mean	Dharwad	Bagalkot	Niphad	Pune	Mean	
1	MACS 4058	01	1.85	2.26	**2.06**	2.17	1.94	1.62	2.15	**1.97**	**2.01**
2	MPO 1336	02	2.13	3.98	**3.06**	3.08	3.36	3.41	3.87	**3.43**	**3.24**
3	HI 8804	03	2.55	3.16	**2.86**	2.41	3.00	3.05	2.83	**2.82**	**2.84**
4	GW 1343	04	2.24	2.83	**2.54**	2.80	2.47	1.97	2.53	**2.44**	**2.49**
5	UAS 466	05	5.55	5.90	**5.73**	4.62	5.22	5.64	5.27	**5.19**	**5.46**
6	NIDW 1099	06	4.89	4.74	**4.82**	4.05	5.12	4.71	4.62	**4.63**	**4.72**
7	DDW 45	07	5.43	5.42	**5.43**	4.71	4.80	4.90	4.34	**4.69**	**5.06**
8	MPO 1335	08	3.63	3.50	**3.57**	4.07	4.10	4.00	3.91	**4.02**	**3.79**
9	HI 8805	09	3.47	4.17	**3.82**	4.16	3.76	4.62	4.99	**4.38**	**4.10**
10	MACS 4059	10	3.11	4.06	**3.59**	4.16	6.44	3.52	3.66	**4.45**	**4.02**
11	UAS 467	11	6.15	5.90	**6.03**	7.08	2.93	6.72	6.16	**5.72**	**5.87**
12	GW 1346	12	3.85	2.30	**3.08**	2.19	3.04	2.48	2.04	**2.44**	**2.76**
13	MACS 4063	13	3.45	3.47	**3.46**	3.81	2.76	3.67	3.83	**3.52**	**3.49**
14	NIDW 1113	14	5.71	6.00	**5.86**	6.20	5.63	6.81	6.48	**6.28**	**6.07**
15	GW 1347	15	2.13	3.03	**2.58**	2.62	3.23	2.84	2.68	**2.84**	**2.71**
16	AKDW 2997-16(C)	16	2.23	3.08	**2.66**	2.79	3.01	2.88	3.36	**3.01**	**2.83**
17	DDW 46	17	5.72	6.09	**5.91**	5.38	5.56	6.81	5.98	**5.93**	**5.92**
18	HI 8806	18	4.68	5.02	**4.85**	5.55	4.58	5.78	5.51	**5.36**	**5.10**
19	HI 8803	19	4.86	5.65	**5.26**	5.37	4.42	5.71	5.65	**5.29**	**5.27**
20	HI 8627(C)	20	5.13	5.79	**5.46**	4.83	5.72	5.91	5.26	**5.43**	**5.45**
21	HI 8802	21	5.30	5.42	**5.36**	5.72	4.87	6.03	5.40	**5.51**	**5.43**
22	MACS 4062	22	3.28	2.97	**3.13**	3.07	3.30	3.34	3.25	**3.24**	**3.18**
23	DDW 47	23	7.55	7.31	**7.43**	7.59	7.63	8.47	7.79	**7.87**	**7.65**
24	AKDW 4896	24	3.30	3.96	**3.63**	3.33	3.16	3.78	3.99	**3.57**	**3.60**
25	GW 1344	25	2.84	3.58	**3.21**	3.28	3.46	3.26	3.33	**3.33**	**3.27**
	Mean		**4.04**	**4.38**	**4.21**	**4.20**	**4.14**	**4.48**	**4.36**	**4.29**	**4.25**

Evaluation of *T. durum* NIVT entries for γ-gliadin (Table 39)

The entries in NIVT 4 and NIVT 5B including checks were analyzed for γ-gliadin. The percent samples carrying γ–gliadin '45' were 94 and 96 in NIVT 4 and NIVT 5B respectively. The entries with γ-gliadin42 were GW 1338 and GW 1339 in NIVT 4. In NIVT 5B, the entry, GW 1346 had γ-gliadin '44'.

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

Sr. No.	Variety	Code	Ɣ-gliadin	Sr. No.	Variety	Code	Ɣ-gliadin
NIVT-4				NIVT-5B			
1	HI 8801	N-601	45	1	MACS 4058	N-801	45
2	GW 1341	N-602	45	2	MPO 1336	N-802	45
3	NIAW 1101	N-603	45	3	HI 8804	N-803	45
4	AKDW5012	N-604	45	4	GW 1343	N-804	45
5	DDW 44	N-605	45	5	UAS 466	N-805	45
6	GW 1339	N-606	42	6	NIDW 1099	N-806	45
7	MACS4064	N-607	45	7	DDW 45	N-807	45
8	MACS4067	N-608	45	8	MPO 1335	N-808	45
9	UPD 99	N-609	45	9	HI 8805	N-809	45
10	AKDW 503	N-610	45	10	MACS 4059	N-810	45
11	PBND5128	N-611	45	11	UAS 467	N-811	45
12	HI 8800	N-612	45	12	GW 1346	N-812	44
13	PDW 351	N-613	45	13	MACS 4063	N-813	45
14	MPO 1344	N-614	45	14	NIDW 1113	N-814	45
15	PDW 354	N-615	45	15	GW 1347	N-815	45
16	MACS4071	N-616	45	16	AKDW 2997-16(C)	N-816	45
17	HI 8799	N-617	45	17	DDW 46	N-817	45
18	PDW 353	N-618	45	18	HI 8806	N-818	45
19	GW 1338	N-619	42	19	HI 8803	N-819	45
20	UAS 465	N-620	45	20	HI 8627(C)	N-820	45
21	MPO 1343	N-621	45	21	HI 8802	N-821	45
22	WHD 961	N-622	45	22	MACS 4062	N-822	45
23	RKD 320	N-623	45	23	DDW 47	N-823	45
24	PDW 352	N-624	45	24	AKDW 4896	N-824	45
25	GW 1340	N-625	45	25	GW 1344	N-825	45
26	HI 8797	N-626	45				
27	UAS 464	N-627	45				
28	HI 8795	N-628	45				
29	NIAW 1100	N-629	45				
30	RKD 318	N-630	45				
31	WHD 962	N-631	45				
32	HI 8798	N-632	45				
33	UAS428(C)	N-633	45				
34	DDW 43	N-634	45				
35	HI 8737(C)	N-635	45				
36	HI 8796	N-636	45				

Table 40: Grain appearance of *T.aestivum* genotypes in Northern Hills Zone IVT's

Variety	Code	Almora	Shimla	Malan	Mean
Irrigated, Timely Sown					
1. HPW 441	01	5.4	5.9	6.0	**5.8**
2. HPW 442	02	5.8	5.7	6.2	**5.9**
3. HPW 443	03	5.6	5.9	6.1	**5.9**
4. HPW 444	04	5.5	5.7	6.2	**5.8**
5. HPW 445	05	5.6	6.2	5.9	**5.9**
6. HPW 446	06	5.8	6.3	6.1	**6.1**
7. HPW 447	07	5.9	6.2	6.0	**6.0**
8. UP 2991	08	6.1	6.0	6.0	**6.0**
9. HS 631	09	6.0	5.7	6.2	**6.0**
10. HS 636	10	5.7	6.1	5.8	**5.9**
11. HS 635	11	5.5	6.0	6.0	**5.8**
12. HS 632	12	6.1	6.1	6.3	**6.2**
13. HS 633	13	6.0	6.0	6.2	**6.1**
14. HS 634	14	6.3	6.3	6.3	**6.3**
15. HS 637	15	5.8	6.2	5.7	**5.9**
16. UP 2990	16	5.7	6.0	5.8	**5.8**
17. VL 2026	17	6.0	6.3	6.3	**6.2**
18. VL 2027	18	6.1	6.0	6.1	**6.1**
19. VL 2025	19	5.8	6.2	6.2	**6.1**
20. VL 2029	20	5.6	5.5	5.5	**5.5**
21. VL 2028	21	5.5	5.6	6.0	**5.7**
22. VL 2030	22	5.7	5.4	6.1	**5.7**
23. VL 907 (C)	23	5.8	6.0	6.1	**6.0**
24. HS 507 (C)	24	5.7	5.8	6.0	**5.8**
Mean		**5.8**	**6.0**	**6.0**	**5.9**
Rainfed, Timely Sown					
1. HPW 441	01	5.1	5.4	6.2	**5.6**
2. HPW 442	02	6.1	5.7	6.0	**5.9**
3. HPW 443	03	5.5	5.6	6.0	**5.7**
4. HPW 444	04	5.1	5.3	5.9	**5.4**
5. HPW 445	05	5.7	5.6	6.2	**5.8**
6. HPW 446	06	6.1	6.0	6.2	**6.1**
7. HPW 447	07	6.3	5.6	6.3	**6.1**
8. UP 2991	08	6.1	6.2	6.2	**6.2**
9. HS 631	09	6.0	6.1	6.3	**6.1**
10. HS 636	10	6.1	5.9	6.3	**6.1**
11. HS 635	11	6.0	5.9	6.2	**6.0**
12. HS 632	12	6.2	6.1	6.2	**6.2**
13. HS 633	13	5.7	5.9	6.3	**6.0**
14. HS 634	14	6.2	6.1	6.4	**6.2**
15. HS 637	15	5.9	5.6	6.0	**5.8**
16. UP 2990	16	6.0	5.9	6.3	**6.1**
17. VL 2026	17	6.0	6.2	6.0	**6.1**
18. VL 2027	18	6.1	6.1	6.4	**6.2**
19. VL 2025	19	6.0	6.1	6.1	**6.1**
20. VL 2029	20	5.9	5.8	6.3	**6.0**
21. VL 2028	21	6.3	5.8	6.2	**6.1**
22. VL 2030	22	5.6	5.6	6.1	**5.8**
23. VL 907 (C)	23	5.8	6.0	6.1	**6.0**
24. HS 507 (C)	24	5.9	6.0	6.3	**6.1**
Mean		**5.9**	**5.9**	**6.2**	**6.0**

Cont…..

Table 40: Grain appearance of *T.aestivum* genotypes in Northern Hill Zone IVT's

Variety	Almora	Shimla	Malan	Mean
Rainfed Early, Sown				
1. VL 829 (C)	5.9	5.8	6.2	**6.0**
2. HPW 251 (C)	5.6	5.9	6.1	**5.9**
3. HS 542 (C)	5.7	5.7	6.3	**5.9**
4. HPW 439	5.3	5.2	6.4	**5.6**
5. HPW 440	5.0	5.4	6.2	**5.5**
6. HS 643	5.4	5.8	6.5	**5.9**
7. HS 644	5.3	5.6	6.3	**5.7**
8. HS 645	5.9	5.7	6.4	**6.0**
9. VL 1011	5.3	5.3	6.3	**5.6**
10. VL 1012	5.2	5.4	5.8	**5.5**
11. VL 1013	5.8	5.4	6.1	**5.8**
12. UP 2992	5.9	5.8	6.3	**6.0**
Mean	**5.5**	**5.6**	**6.2**	**5.8**
Restricted Irrigation, Late Sown				
1. VL 892(C)	4.7	5.3	5.9	**5.3**
2. HS 490 (C)	5.9	5.0	5.5	**5.5**
3. HS 646	4.9	4.8	5.7	**5.1**
4. HS 647	4.8	5.6	6.0	**5.5**
5. HS 648	5.8	5.9	5.9	**5.9**
6. HPW 448	4.9	5.4	5.7	**5.3**
7. HPW 449	4.8	5.6	5.4	**5.3**
8. VL 3013	5.5	5.9	5.5	**5.6**
9. VL 3014	4.6	5.4	5.4	**5.1**
10. VL 3015	5.0	5.7	5.8	**5.5**
11. UP 2993	5.1	6.1	6.1	**5.8**
Mean	**5.1**	**5.5**	**5.7**	**5.4**

Table 41: Test Weight (kg/hl) of *T.aestivum* genotypes in Northern Hills Zone IVT's

Variety	Code	Almora	Shimla	Malan	Mean
Irrigated, Timely Sown					
1. HPW 441	01	78.5	76.5	78.7	**77.9**
2. HPW 442	02	79.0	78.6	79.2	**78.9**
3. HPW 443	03	80.5	79.3	80.0	**79.9**
4. HPW 444	04	78.5	79.5	80.0	**79.3**
5. HPW 445	05	78.0	76.6	79.0	**77.9**
6. HPW 446	06	76.0	76.0	79.0	**77.0**
7. HPW 447	07	79.5	78.6	80.2	**79.4**
8. UP 2991	08	78.8	77.5	78.7	**78.3**
9. HS 631	09	70.0	78.0	78.0	**75.3**
10. HS 636	10	78.6	76.8	78.5	**78.0**
11. HS 635	11	76.0	76.5	77.6	**76.7**
12. HS 632	12	78.0	77.5	77.0	**77.5**
13. HS 633	13	80.3	79.6	78.0	**79.3**
14. HS 634	14	80.4	81.0	79.5	**80.3**
15. HS 637	15	78.5	76.8	78.8	**78.0**
16. UP 2990	16	77.0	78.2	78.0	**77.7**
17. VL 2026	17	78.3	78.4	79.0	**78.6**
18. VL 2027	18	78.2	78.8	78.7	**78.6**
19. VL 2025	19	78.4	77.5	79.0	**78.3**
20. VL 2029	20	77.0	75.0	78.0	**76.7**
21. VL 2028	21	78.5	77.0	78.0	**77.8**
22. VL 2030	22	79.5	76.5	78.0	**78.0**
23. VL 907 (C)	23	77.5	72.0	77.5	**75.7**
24. HS 507 (C)	24	77.6	77.0	79.0	**77.9**
Mean		**78.0**	**77.5**	**78.6**	**78.0**
Rainfed, Timely Sown					
1. HPW 441	01	78.5	78.5	79.7	**78.9**
2. HPW 442	02	81.6	77.5	80.5	**79.9**
3. HPW 443	03	79.5	81.0	81.0	**80.5**
4. HPW 444	04	80.0	81.2	80.2	**80.5**
5. HPW 445	05	79.5	76.5	79.5	**78.5**
6. HPW 446	06	80.5	80.0	80.5	**80.3**
7. HPW 447	07	83.0	80.2	83.0	**82.1**
8. UP 2991	08	81.0	79.5	80.0	**80.2**
9. HS 631	09	80.3	80.0	80.5	**80.3**
10. HS 636	10	80.5	79.0	80.0	**79.8**
11. HS 635	11	79.5	77.5	77.6	**78.2**
12. HS 632	12	80.0	77.0	78.6	**78.5**
13. HS 633	13	81.7	80.6	79.4	**80.6**
14. HS 634	14	82.0	82.5	81.2	**81.9**
15. HS 637	15	80.0	78.5	78.3	**78.9**
16. UP 2990	16	80.0	79.5	80.0	**79.8**
17. VL 2026	17	81.0	80.0	80.5	**80.5**
18. VL 2027	18	80.7	80.3	80.0	**80.3**
19. VL 2025	19	81.0	79.0	81.5	**80.5**
20. VL 2029	20	79.5	77.5	78.6	**78.5**
21. VL 2028	21	81.0	77.6	80.5	**79.7**
22. VL 2030	22	80.5	78.0	79.2	**79.2**
23. VL 907 (C)	23	77.5	81.0	78.6	**79.0**
24. HS 507 (C)	24	81.0	79.7	80.6	**80.4**
Mean		**80.4**	**79.3**	**80.0**	**79.9**

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Table 41: Test Weight (kg/hl) of *T.aestivum* genotypes in Northern Hill Zone IVT's

Variety	Almora	Shimla	Malan	Mean
Rainfed Early, Sown				
1. VL 829 (C)	79.0	81.0	80.7	**80.2**
2. HPW 251 (C)	77.0	81.3	82.5	**80.3**
3. HS 542 (C)	78.2	81.5	83.3	**81.0**
4. HPW 439	76.0	79.5	79.5	**78.3**
5. HPW 440	75.0	80.5	82.2	**79.2**
6. HS 643	74.7	80.6	82.0	**79.1**
7. HS 644	74.6	79.5	79.4	**77.8**
8. HS 645	76.0	79.0	79.6	**78.2**
9. VL 1011	73.0	78.0	79.0	**76.7**
10. VL 1012	73.5	76.0	76.0	**75.2**
11. VL 1013	76.3	79.3	81.0	**78.9**
12. UP 2992	75.6	80.6	81.0	**79.1**
Mean	**75.7**	**79.7**	**80.5**	**78.7**
Restricted Irrigation, Late Sown				
1. VL 892(C)	79.5	78.6	79.5	**79.2**
2. HS 490 (C)	74.0	75.0	76.6	**75.2**
3. HS 646	71.0	72.3	74.0	**72.4**
4. HS 647	76.0	78.5	79.5	**78.0**
5. HS 648	78.0	80.0	82.2	**80.1**
6. HPW 448	75.0	73.5	77.0	**75.2**
7. HPW 449	73.5	75.5	76.5	**75.2**
8. VL 3013	79.5	79.0	80.5	**79.7**
9. VL 3014	76.2	78.6	77.5	**77.4**
10. VL 3015	76.0	77.2	78.3	**77.2**
11. UP 2993	77.3	80.0	81.4	**79.6**
Mean	**76.0**	**77.1**	**78.5**	**77.2**

Table 42: Protein Content (%) of *T.aestivum* genotypes in Northern Hills Zone IVT's

Variety	Code	Almora	Shimla	Malan	Mean
Irrigated, Timely Sown					
1. HPW 441	1	12.32	11.03	12.60	**11.98**
2. HPW 442	2	12.46	13.35	14.10	**13.30**
3. HPW 443	3	11.97	10.86	13.21	**12.01**
4. HPW 444	4	12.35	10.05	12.99	**11.80**
5. HPW 445	5	12.27	14.21	14.58	**13.69**
6. HPW 446	6	12.42	11.25	13.95	**12.54**
7. HPW 447	7	12.09	12.17	13.71	**12.66**
8. UP 2991	8	10.91	11.00	13.42	**11.78**
9. HS 631	9	12.52	12.73	15.36	**13.54**
10. HS 636	10	11.60	11.55	13.71	**12.29**
11. HS 635	11	12.20	10.52	14.16	**12.29**
12. HS 632	12	13.26	12.81	15.40	**13.82**
13. HS 633	13	12.94	10.89	15.09	**12.97**
14. HS 634	14	12.37	10.47	14.27	**12.37**
15. HS 637	15	12.38	11.62	14.86	**12.95**
16. UP 2990	16	13.07	11.51	14.70	**13.09**
17. VL 2026	17	12.12	12.43	15.10	**13.22**
18. VL 2027	18	12.77	10.76	13.79	**12.44**
19. VL 2025	19	12.68	10.76	13.24	**12.23**
20. VL 2029	20	11.83	13.29	15.28	**13.47**
21. VL 2028	21	11.41	11.00	14.54	**12.32**
22. VL 2030	22	12.22	11.62	14.30	**12.71**
23. VL 907 (C)	23	12.44	10.00	12.42	**11.62**
24. HS 507 (C)	24	12.72	11.69	13.72	**12.71**
Mean		**12.31**	**11.57**	**14.10**	**12.66**
Rainfed, Timely Sown					
1. HPW 441	1	12.33	10.45	9.97	**10.92**
2. HPW 442	2	12.98	13.30	9.94	**12.07**
3. HPW 443	3	12.37	10.28	8.47	**10.37**
4. HPW 444	4	11.81	9.99	8.64	**10.15**
5. HPW 445	5	11.83	11.66	9.07	**10.85**
6. HPW 446	6	11.82	10.37	9.61	**10.60**
7. HPW 447	7	11.55	11.01	10.19	**10.92**
8. UP 2991	8	10.93	12.36	9.11	**10.80**
9. HS 631	9	11.34	11.52	10.42	**11.09**
10. HS 636	10	10.68	10.31	10.44	**10.48**
11. HS 635	11	11.04	10.27	10.08	**10.46**
12. HS 632	12	13.02	12.65	11.49	**12.39**
13. HS 633	13	13.85	11.75	11.09	**12.23**
14. HS 634	14	12.52	10.16	10.95	**11.21**
15. HS 637	15	11.29	12.12	9.47	**10.96**
16. UP 2990	16	11.44	10.72	10.41	**10.86**
17. VL 2026	17	12.25	12.18	9.91	**11.45**
18. VL 2027	18	10.68	10.80	10.47	**10.65**
19. VL 2025	19	11.43	11.19	9.51	**10.71**
20. VL 2029	20	11.90	13.26	9.42	**11.53**
21. VL 2028	21	10.88	11.34	8.81	**10.34**
22. VL 2030	22	12.55	12.13	9.70	**11.46**
23. VL 907 (C)	23	11.60	9.55	10.17	**10.44**
24. HS 507 (C)	24	10.67	11.94	10.01	**10.87**
Mean		**11.78**	**11.30**	**9.89**	**10.99**

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Table 42: Protein Content (%) of *T.aestivum* genotypes in Northern Hill Zone IVT's

Variety	Almora	Shimla	Malan	Mean
Rainfed Early, Sown				
1. VL 829 (C)	15.87	10.71	10.56	**12.38**
2. HPW 251 (C)	15.67	11.38	10.79	**12.61**
3. HS 542 (C)	15.91	12.28	10.79	**12.99**
4. HPW 439	15.54	10.84	11.00	**12.46**
5. HPW 440	15.23	12.42	12.67	**13.44**
6. HS 643	15.75	11.73	10.79	**12.76**
7. HS 644	15.96	10.99	11.35	**12.77**
8. HS 645	15.34	11.29	11.06	**12.56**
9. VL 1011	15.00	10.37	10.67	**12.01**
10. VL 1012	15.74	12.52	11.53	**13.26**
11. VL 1013	15.97	11.76	12.35	**13.36**
12. UP 2992	15.05	12.25	10.92	**12.74**
Mean	**15.59**	**11.55**	**11.21**	**12.78**
Restricted Irrigation, Late Sown				
1. VL 892(C)	13.67	12.76	12.06	**12.83**
2. HS 490 (C)	13.63	11.59	10.73	**11.98**
3. HS 646	14.21	13.30	11.43	**12.98**
4. HS 647	14.26	12.46	11.08	**12.60**
5. HS 648	13.97	12.73	11.40	**12.70**
6. HPW 448	13.96	13.44	12.86	**13.42**
7. HPW 449	13.22	12.85	12.23	**12.77**
8. VL 3013	14.72	12.49	12.71	**13.31**
9. VL 3014	14.93	13.59	12.22	**13.58**
10. VL 3015	13.02	11.81	10.95	**11.93**
11. UP 2993	13.48	11.67	11.02	**12.06**
Mean	**13.92**	**12.61**	**11.70**	**12.74**

Table 43: Sedimentation Value (ml) of *T.aestivum* genotypes in Northern Hills Zone IVT's

Variety	Code	Almora	Shimla	Malan	Mean
Irrigated, Timely Sown					
1. HPW 441	1	42	36	38	**39**
2. HPW 442	2	42	46	41	**43**
3. HPW 443	3	44	48	39	**44**
4. HPW 444	4	42	41	48	**44**
5. HPW 445	5	42	45	44	**44**
6. HPW 446	6	47	48	46	**47**
7. HPW 447	7	40	39	45	**41**
8. UP 2991	8	40	45	48	**44**
9. HS 631	9	43	47	40	**43**
10. HS 636	10	40	48	45	**44**
11. HS 635	11	44	43	39	**42**
12. HS 632	12	46	39	41	**42**
13. HS 633	13	45	45	43	**44**
14. HS 634	14	43	47	40	**43**
15. HS 637	15	48	46	45	**46**
16. UP 2990	16	45	44	42	**44**
17. VL 2026	17	45	47	48	**47**
18. VL 2027	18	40	35	39	**38**
19. VL 2025	19	47	40	44	**44**
20. VL 2029	20	44	46	42	**44**
21. VL 2028	21	48	39	46	**44**
22. VL 2030	22	40	51	44	**45**
23. VL 907 (C)	23	42	40	43	**42**
24. HS 507 (C)	24	43	42	45	**43**
Mean		**43**	**44**	**43**	**43**
Rainfed, Timely Sown					
1. HPW 441	1	35	38	44	**39**
2. HPW 442	2	45	41	44	**43**
3. HPW 443	3	46	45	48	**46**
4. HPW 444	4	40	45	44	**43**
5. HPW 445	5	45	50	49	**48**
6. HPW 446	6	43	44	41	**43**
7. HPW 447	7	47	43	46	**45**
8. UP 2991	8	50	44	46	**47**
9. HS 631	9	52	45	48	**48**
10. HS 636	10	42	44	42	**43**
11. HS 635	11	40	41	41	**41**
12. HS 632	12	39	40	47	**42**
13. HS 633	13	48	42	47	**46**
14. HS 634	14	45	43	45	**44**
15. HS 637	15	49	40	45	**45**
16. UP 2990	16	52	40	43	**45**
17. VL 2026	17	48	50	52	**50**
18. VL 2027	18	45	38	42	**42**
19. VL 2025	19	48	44	45	**46**
20. VL 2029	20	44	45	42	**44**
21. VL 2028	21	41	53	46	**47**
22. VL 2030	22	47	54	48	**50**
23. VL 907 (C)	23	43	40	44	**42**
24. HS 507 (C)	24	38	44	41	**41**
Mean		**45**	**44**	**45**	**45**

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Table 43: Sedimentation Value (ml) of *T.aestivum* genotypes in Northern Hill Zone IVT's

Variety	Almora	Shimla	Malan	Mean
Rainfed Early, Sown				
1. VL 829 (C)	39	40	40	**40**
2. HPW 251 (C)	40	39	40	**40**
3. HS 542 (C)	46	44	47	**46**
4. HPW 439	46	43	47	**45**
5. HPW 440	42	48	46	**45**
6. HS 643	46	43	47	**45**
7. HS 644	43	40	46	**43**
8. HS 645	45	49	41	**45**
9. VL 1011	48	50	50	**49**
10. VL 1012	44	41	42	**42**
11. VL 1013	42	46	49	**46**
12. UP 2992	44	43	44	**44**
Mean	**44**	**44**	**45**	**44**
Restricted Irrigation, Late Sown				
1. VL 892(C)	46	50	53	**50**
2. HS 490 (C)	48	45	40	**44**
3. HS 646	50	47	54	**50**
4. HS 647	49	44	48	**47**
5. HS 648	44	49	44	**46**
6. HPW 448	52	47	45	**48**
7. HPW 449	47	48	50	**48**
8. VL 3013	53	51	44	**49**
9. VL 3014	46	44	47	**46**
10. VL 3015	52	43	48	**48**
11. UP 2993	50	49	47	**49**
Mean	**49**	**47**	**47**	**48**

Table 44: Moisture Content (%) of *T.aestivum* genotypes in Northern Hills Zone IVT's

Variety	Code	Almora	Shimla	Malan	Mean
Irrigated, Timely Sown					
1. HPW 441	1	11.79	12.43	11.16	**11.79**
2. HPW 442	2	11.89	12.06	10.60	**11.52**
3. HPW 443	3	11.67	12.32	10.51	**11.50**
4. HPW 444	4	11.70	12.41	10.82	**11.64**
5. HPW 445	5	11.64	11.96	10.47	**11.36**
6. HPW 446	6	11.79	12.03	10.60	**11.47**
7. HPW 447	7	11.79	12.34	10.76	**11.63**
8. UP 2991	8	11.68	12.02	10.60	**11.43**
9. HS 631	9	11.70	12.03	10.77	**11.50**
10. HS 636	10	11.70	12.14	10.26	**11.37**
11. HS 635	11	11.86	12.06	10.66	**11.53**
12. HS 632	12	11.82	11.95	10.54	**11.44**
13. HS 633	13	11.82	11.91	10.55	**11.43**
14. HS 634	14	11.83	12.42	10.71	**11.65**
15. HS 637	15	11.59	12.25	10.35	**11.40**
16. UP 2990	16	11.77	12.14	12.48	**12.13**
17. VL 2026	17	11.80	11.91	10.85	**11.52**
18. VL 2027	18	11.93	12.29	12.14	**12.12**
19. VL 2025	19	11.61	12.28	10.71	**11.53**
20. VL 2029	20	11.68	11.95	10.33	**11.32**
21. VL 2028	21	11.76	12.16	10.61	**11.51**
22. VL 2030	22	11.72	11.93	10.42	**11.36**
23. VL 907 (C)	23	11.92	12.58	10.53	**11.68**
24. HS 507 (C)	24	11.82	12.33	12.06	**12.07**
Mean		**11.76**	**12.16**	**10.81**	**11.58**
Rainfed, Timely Sown					
1. HPW 441	1	11.58	11.98	10.48	**11.35**
2. HPW 442	2	11.50	11.41	9.96	**10.96**
3. HPW 443	3	11.69	11.60	10.32	**11.20**
4. HPW 444	4	11.57	11.91	10.15	**11.21**
5. HPW 445	5	11.45	11.26	10.00	**10.90**
6. HPW 446	6	11.66	10.76	10.13	**10.85**
7. HPW 447	7	11.50	11.70	10.20	**11.13**
8. UP 2991	8	11.56	11.46	10.14	**11.05**
9. HS 631	9	11.64	11.52	9.91	**11.02**
10. HS 636	10	11.28	11.67	9.69	**10.88**
11. HS 635	11	11.66	11.56	9.93	**11.05**
12. HS 632	12	11.49	11.03	10.44	**10.99**
13. HS 633	13	11.41	10.89	9.85	**10.72**
14. HS 634	14	11.51	11.66	10.48	**11.22**
15. HS 637	15	11.57	11.27	10.22	**11.02**
16. UP 2990	16	11.69	11.71	10.26	**11.22**
17. VL 2026	17	11.53	11.06	10.24	**10.94**
18. VL 2027	18	11.69	12.07	10.57	**11.44**
19. VL 2025	19	11.47	11.39	10.61	**11.16**
20. VL 2029	20	11.41	11.07	10.01	**10.83**
21. VL 2028	21	11.33	10.90	9.88	**10.70**
22. VL 2030	22	11.31	11.22	10.12	**10.88**
23. VL 907 (C)	23	11.82	11.23	10.30	**11.12**
24. HS 507 (C)	24	11.76	10.92	10.02	**10.90**
Mean		**11.55**	**11.39**	**10.16**	**11.03**

Cont…..

Table 44: Moisture Content (%) of *T.aestivum* genotypes in Northern Hill Zone IVT's

Variety	Almora	Shimla	Malan	Mean
Rainfed Early, Sown				
1. VL 829 (C)	11.03	11.87	9.97	**10.96**
2. HPW 251 (C)	11.08	12.01	9.86	**10.98**
3. HS 542 (C)	11.29	12.14	10.23	**11.22**
4. HPW 439	11.28	11.93	10.09	**11.10**
5. HPW 440	10.93	11.91	9.85	**10.90**
6. HS 643	11.29	12.21	10.14	**11.21**
7. HS 644	11.27	11.74	9.76	**10.92**
8. HS 645	10.88	11.76	9.91	**10.85**
9. VL 1011	11.46	11.96	10.18	**11.20**
10. VL 1012	11.16	11.73	9.78	**10.89**
11. VL 1013	11.16	11.74	9.90	**10.93**
12. UP 2992	11.24	11.76	10.05	**11.02**
Mean	**11.17**	**11.90**	**9.98**	**11.02**
Restricted Irrigation, Late Sown				
1. VL 892(C)	11.64	12.44	10.78	**11.62**
2. HS 490 (C)	11.90	12.76	10.68	**11.78**
3. HS 646	11.61	12.46	11.02	**11.70**
4. HS 647	11.79	12.55	10.72	**11.69**
5. HS 648	11.67	12.51	10.71	**11.63**
6. HPW 448	11.71	12.40	10.69	**11.60**
7. HPW 449	11.88	12.50	10.87	**11.75**
8. VL 3013	11.78	12.60	10.73	**11.70**
9. VL 3014	11.63	12.34	10.58	**11.52**
10. VL 3015	11.67	12.60	10.54	**11.60**
11. UP 2993	11.65	12.69	10.36	**11.57**
Mean	**11.72**	**12.53**	**10.70**	**11.65**

Table 45: Quality Characteristics of *T.aestivum* genotypes in Southern Hill Zone IVT (Wellington)

	Variety	Code	Grain Appearance (max-10)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)	Moisture Content (%)
Restricted, Timely Sown							
1.	UAS 397	1	6.2	75.0	12.43	48	13.04
2.	HW 5261	2	6.4	73.0	12.58	44	12.81
3.	HW 5265	3	5.6	77.5	11.87	41	12.83
4.	HW 5254	4	6.2	73.7	11.72	45	12.87
5.	UAS 396	5	6.1	76.8	12.87	43	12.67
6.	HS 641	6	5.8	73.0	11.56	47	12.86
7.	HW 2044 (C)	7	6.1	75.7	12.06	49	13.28
8.	Cow (W) 1 (C)	8	5.7	72.0	11.78	47	12.75
9.	HW 5053	9	6.1	80.0	12.06	47	13.12
10.	HW 5216 (C)	10	6.3	75.2	12.10	48	12.87
11.	HS 639	11	6.0	75.0	11.59	42	12.72
12.	HS 638	12	6.2	77.7	12.26	51	12.37
13.	MACS 6706	13	5.8	76.0	12.71	44	12.76
14.	HS 642	14	6.0	76.0	12.01	42	12.95
15.	HS 640	15	6.1	75.6	12.15	50	13.13
16.	HW 5054	16	6.3	78.5	12.70	50	13.00
17.	HW 5255	17	5.9	75.0	12.03	44	12.86
18.	HW 5052	18	6.4	78.2	12.80	39	13.00
	Mean		**6.1**	**75.8**	**12.18**	**46**	**12.88**

SECTION C

SPECIAL TRIALS

i. *T. dicoccum*

ii. Salinity/Alkalinity

iii. Triticale

iv. Very Late Sown

v. MABB

SPECIAL TRIALS

Dicoccum Trial (Table 1-4)

Dicoccum samples were received from five centres of PZ namely Dharwad, Arabhavi, Kalloli, Ugarkhurd and Pune, and one location of SHZ i.e. Wellington. There were seven genotypes under testing including four new test entries of dicoccum and data were recorded on 1000 grain weight (TGW), grain protein content (GPC), sedimentation value and yellow pigments content.

Salinity/Alkalinity Trial (Table 5-8)

Ten entries including three checks were received from three locations namely Karnal, Kanpur &Hisar and analysed for grain appearance score, test weight, protein content and sedimentation value.

Triticale Trial (Table 9-13)

This trial was conducted under RainfedTimely Sown condition in Shimla and Malan centres of NHZ. There were five entries tested against two *triticale* (TL 2942 & TL 2969) and one *aestivum* (HS 507) checks. The entries including checks were analysed for grain appearance score, test weight, protein content, sedimentation value and moisture content.

Very Late Sown Trial (Table 14-19)

This trial was conducted at Delhi, Ludhiana, Pantnagar&Hisar (NWPZ) and Varanasi, Pusa&Sabour (NEPZ) under very late sown condition. The entries including checks were analysed for grain appearance score, test weight, protein content, grain hardness Index, sedimentation value and moisture content.

MABB Trial (Table 20-27)

Two entries and four checks were received from Ludhiana, Durgapura, Delhi, Pantnagar, Karnal&Hisar) of NWPZ. These were analysed for processing quality parameters viz. grain appearance score, test weight, protein content, grain hardness index, sedimentation value & moisture content and nutritional parameters viz. iron and zinc content.

Table 1: Thousand grain weight (g) of Dicoccum genotypes

Sr. No.	Variety	PZ						SHZ	Overall Mean
		Dharwad	Arabhavi	Kalloli	Ugarkhurd	Pune	Mean	Wellington	
1.	HW 1098 (C)	40.6	45.4	41.2	44.1	37.3	**41.7**	**35.9**	**38.8**
2.	DDK 1029 (C)	44.3	42.4	36.6	43.6	42.8	**41.9**	**35.8**	**38.9**
3.	MACS 6222 (*aest.*) (C)	35.9	43.7	37.6	43.7	37.9	**39.8**	**35.5**	**37.6**
4.	DDK 1052	36.2	49.7	42.3	46.6	41.7	**43.3**	**33.3**	**38.3**
5.	DDK 1053	39.0	44.0	40.2	42.0	35.1	**40.1**	**37.6**	**38.8**
6.	MACS 5047	34.9	42.5	39.5	41.3	37.1	**39.1**	**36.8**	**37.9**
7.	MACS 5049	39.4	39.7	36.8	40.8	40.3	**39.4**	**33.6**	**36.5**
	Mean	**38.6**	**43.9**	**39.2**	**43.1**	**38.9**	**40.7**	**35.5**	**38.1**

Table 2:Protein Content (%) of Dicoccum genotypes

Sr. No.	Variety	PZ						SHZ	Overall Mean
		Dharwad	Arabhavi	Kalloli	Ugarkhurd	Pune	Mean	Wellington	
1.	HW 1098 (C)	13.3	12.3	15.2	10.2	14.4	**13.1**	**14.2**	**13.6**
2.	DDK 1029 (C)	14.0	11.8	15.2	9.5	14.6	**13.0**	**13.6**	**13.3**
3.	MACS 6222 (*aest.*) (C)	13.1	12.3	15.0	10.5	12.4	**12.7**	**12.5**	**12.6**
4.	DDK 1052	13.8	11.9	15.2	10.1	13.2	**12.8**	**14.3**	**13.6**
5.	DDK 1053	13.2	12.4	15.2	10.7	14.5	**13.2**	**13.6**	**13.4**
6.	MACS 5047	13.5	12.5	15.2	10.5	15.1	**13.4**	**15.4**	**14.4**
7.	MACS 5049	13.9	11.0	14.5	9.4	14.2	**12.6**	**15.4**	**14.0**
	Mean	**13.5**	**12.0**	**15.1**	**10.1**	**14.1**	**13.0**	**14.1**	**13.5**

Table 3:Sedimentation Value (ml) of Dicoccum genotypes

Sr. No.	Variety	PZ						SHZ	Overall Mean
		Dharwad	Arabhavi	Kalloli	Ugarkhurd	Pune	Mean	Wellington	
1.	HW 1098 (C)	29	22	27	21	23	**24**	**26**	**25**
2.	DDK 1029 (C)	29	32	26	26	26	**28**	**30**	**29**
3.	MACS 6222 (*aest.*) (C)	26	24	29	21	25	**25**	**27**	**26**
4.	DDK 1052	26	20	22	21	22	**22**	**21**	**22**
5.	DDK 1053	26	23	25	21	23	**24**	**23**	**23**
6.	MACS 5047	28	22	24	26	23	**25**	**21**	**23**
7.	MACS 5049	39	39	36	36	36	**37**	**35**	**36**
	Mean	**29**	**26**	**27**	**25**	**25**	**26**	**26**	**26**

Table 4:Yellow Pigment (ppm) of Dicoccum genotypes

Sr. No.	Variety	PZ						SHZ	Overall Mean
		Dharwad	Arabhavi	Kalloli	Ugarkhurd	Pune	Mean	Wellington	
1.	HW 1098 (C)	2.35	2.1	2.18	2.06	3.11	**2.36**	**3.57**	**2.97**
2.	DDK 1029 (C)	2.64	2.38	2.5	2.35	2.7	**2.51**	**3.72**	**3.12**
3.	MACS 6222 (*aest.*) (C)	2.71	1.74	2.26	1.98	2.56	**2.25**	**3.57**	**2.91**
4.	DDK 1052	2.26	1.7	2.1	1.73	2.45	**2.05**	**4.09**	**3.07**
5.	DDK 1053	2.47	2.18	2.46	2.19	3.07	**2.47**	**3.31**	**2.89**
6.	MACS 5047	2.05	2.15	2.23	2.32	2.93	**2.34**	**4.25**	**3.29**
7.	MACS 5049	2.26	2	2.28	1.91	2.16	**2.12**	**4.02**	**3.07**
	Mean	**2.39**	**2.04**	**2.29**	**2.08**	**2.71**	**2.30**	**3.79**	**3.05**

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

Sr. No.	Entry	Kanpur	Hisar	Karnal	Mean
1.	KRL 19 (C)	4.5	6.0	6.0	**5.5**
2.	Kh-65 (C)	4.4	4.9	4.9	**4.7**
3.	KRL 210 (C)	6.2	5.9	6.2	**6.1**
4.	DBW 246	5.8	5.9	5.7	**5.8**
5.	DBW 247	6.1	5.8	5.8	**5.9**
6.	DBW 248	6.0	5.9	5.9	**5.9**
7.	KRL 370	5.9	6.0	6.3	**6.1**
8.	KRL 377	5.4	5.8	6.0	**5.7**
9.	KRL 384	5.5	5.5	6.0	**5.7**
10.	KRL 386	5.9	6.0	5.9	**5.9**
11.	WH 1316	5.9	5.8	6.0	**5.9**
	Mean	**5.6**	**5.8**	**5.9**	**5.8**

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

Sr. No.	Entry	Kanpur	Hisar	Karnal	Mean
1.	KRL 19 (C)	68.0	82.1	83.5	**77.9**
2.	Kh-65 (C)	76.6	84.4	85.2	**82.1**
3.	KRL 210 (C)	83.6	81.8	85.4	**83.6**
4.	DBW 246	81.5	79.4	80.7	**80.5**
5.	DBW 247	82.1	79.6	81.8	**81.1**
6.	DBW 248	81.0	76.8	80.9	**79.6**
7.	KRL 370	81.2	79.5	83.9	**81.5**
8.	KRL 377	77.3	80.8	81.0	**79.7**
9.	KRL 384	82.0	81.4	83.9	**82.4**
10.	KRL 386	82.6	79.5	83.8	**82.0**
11.	WH 1316	82.1	79.0	84.3	**81.8**
	Mean	**79.8**	**80.4**	**83.1**	**81.1**

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

Sr. No.	Entry	Kanpur	Hisar	Karnal	Mean
1.	KRL 19 (C)	13.3	10.3	12.7	**12.1**
2.	Kh-65 (C)	12.1	11.1	11.7	**11.6**
3.	KRL 210 (C)	11.3	10.1	10.8	**10.7**
4.	DBW 246	11.4	11.7	12.3	**11.8**
5.	DBW 247	11.9	11.8	11.7	**11.8**
6.	DBW 248	11.3	11.0	12.4	**11.6**
7.	KRL 370	9.0	9.4	11.5	**10.0**
8.	KRL 377	10.0	10.0	11.8	**10.6**
9.	KRL 384	12.2	11.1	11.8	**11.7**
10.	KRL 386	9.3	11.0	11.2	**10.5**
11.	WH 1316	11.3	11.9	11.4	**11.5**
	Mean	**11.2**	**10.8**	**11.8**	**11.3**

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

Sr. No.	Entry	Kanpur	Hisar	Karnal	Mean
1.	KRL 19 (C)	37	38	43	**39**
2.	Kh-65 (C)	36	39	44	**40**
3.	KRL 210 (C)	38	38	34	**37**
4.	DBW 246	30	37	32	**33**
5.	DBW 247	52	49	44	**48**
6.	DBW 248	38	32	37	**36**
7.	KRL 370	43	45	44	**44**
8.	KRL 377	39	55	45	**46**
9.	KRL 384	38	31	34	**34**
10.	KRL 386	35	41	40	**39**
11.	WH 1316	38	40	45	**41**
	Mean	**39**	**40**	**40**	**40**

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

Sr. No.	Variety	Shimla	Malan	Mean
Rainfed, Timely sown				
1.	TL 2942 (C)	4.2	5.9	**5.1**
2.	TL 2969 (C)	4.0	5.8	**4.9**
3.	HS 507(*aest.*) (C)	5.5	5.9	**5.7**
4.	TL 3011	4.3	5.5	**4.9**
5.	TL 3012	4.2	5.8	**5.0**
6.	TL 3013	4.0	5.8	**4.9**
7.	TL 3014	4.3	5.7	**5.0**
8.	TL 3015	4.5	5.6	**5.1**
	Mean	**4.4**	**5.8**	**5.1**

Table10 :Test Weight (kg/hl) of *Triticale* genotypes in NHZ

Sr. No.	Variety	Shimla	Malan	Mean
Rainfed, Timely sown				
1.	TL 2942 (C)	68.2	73.2	**70.7**
2.	TL 2969 (C)	72.0	73.0	**72.5**
3.	HS 507(*aest.*) (C)	80.4	80.3	**80.4**
4.	TL 3011	71.0	72.0	**71.5**
5.	TL 3012	66.6	70.0	**68.3**
6.	TL 3013	70.6	74.6	**72.6**
7.	TL 3014	70.5	73.0	**71.8**
8.	TL 3015	71.6	74.6	**73.1**
	Mean	**71.4**	**73.8**	**72.6**

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

Sr. No.	Variety	Shimla	Malan	Mean
Rainfed, Timely sown				
1.	TL 2942 (C)	14.59	11.12	**12.86**
2.	TL 2969 (C)	12.50	9.55	**11.03**
3.	HS 507(*aest.*) (C)	12.24	8.40	**10.32**
4.	TL 3011	13.28	10.55	**11.92**
5.	TL 3012	14.00	11.30	**12.65**
6.	TL 3013	14.63	11.14	**12.89**
7.	TL 3014	13.25	10.85	**12.05**
8.	TL 3015	12.77	10.78	**11.78**
	Mean	**13.41**	**10.46**	**11.93**

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

Sr. No.	Variety	Shimla	Malan	Mean
Rainfed, Timely sown				
1.	TL 2942 (C)	30	30	**30**
2.	TL 2969 (C)	32	32	**32**
3.	HS 507(*aest.*) (C)	38	36	**37**
4.	TL 3011	32	31	**32**
5.	TL 3012	29	27	**28**
6.	TL 3013	35	39	**37**
7.	TL 3014	32	33	**33**
8.	TL 3015	31	30	**31**
	Mean	**32**	**32**	**32**

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

Sr. No.	Variety	Shimla	Malan	Mean
Rainfed, Timely sown				
1.	TL 2942 (C)	12.12	10.50	**11.31**
2.	TL 2969 (C)	12.48	10.21	**11.35**
3.	HS 507(*aest.*) (C)	12.58	9.85	**11.22**
4.	TL 3011	12.18	10.49	**11.34**
5.	TL 3012	12.23	10.37	**11.30**
6.	TL 3013	12.13	10.48	**11.31**
7.	TL 3014	12.31	10.38	**11.35**
8.	TL 3015	12.51	10.21	**11.36**
	Mean	**12.32**	**10.31**	**11.31**

Table 14: Grain appearance (Max-10) of *T.aestivum* genotypes inVLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	6.2	6.0	5.3	6.0	**5.9**	6.4	5.9	6.4	**6.2**	**6.1**
2	DBW 14 (C)	5.9	5.3	5.4	5.6	**5.6**	5.8	5.3	6.3	**5.8**	**5.7**
3	DBW 71 (C)	6.0	5.5	5.5	5.5	**5.6**	5.9	5.4	5.7	**5.7**	**5.7**
4	HD 3271	6.1	5.4	5.2	5.4	**5.5**	5.7	5.2	5.7	**5.5**	**5.5**
5	WH 3272	6.0	5.7	5.6	5.3	**5.7**	5.6	5.0	5.6	**5.4**	**5.6**
6	WH 1232	5.9	5.7	5.2	5.3	**5.5**	5.4	4.8	5.7	**5.3**	**5.4**
7	WH 1233	6.0	5.9	5.2	6.0	**5.8**	6.0	5.0	5.8	**5.6**	**5.7**
8	PBW 757	6.3	6.0	5.8	6.1	**6.1**	6.1	5.4	5.9	**5.8**	**6.0**
9	PBW 778	6.2	6.6	6.3	5.6	**6.2**	6.0	5.8	5.5	**5.8**	**6.0**
10	PBW 779	6.6	5.8	6.0	5.5	**6.0**	6.2	4.7	6.0	**5.6**	**5.8**
11	DWB 249	6.4	6.1	6.0	5.7	**6.1**	6.0	4.3	5.8	**5.4**	**5.8**
12	DBW 250	6.5	5.8	5.8	5.3	**5.9**	6.3	4.3	6.2	**5.6**	**5.8**
13	DBW 251	6.0	5.7	5.3	5.1	**5.5**	5.5	4.2	5.4	**5.0**	**5.3**
Mean		**6.2**	**5.8**	**5.6**	**5.6**	**5.8**	**5.9**	**5.0**	**5.8**	**5.6**	**5.7**

Table15: Test Weight (kg/hl) of *T.aestivum* genotypes in VLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	77.0	78.0	77.0	77.3	**77.3**	82.5	83.0	79.0	**81.5**	**79.4**
2	DBW 14 (C)	76.5	72.0	75.0	75.0	**74.6**	76.8	76.5	72.3	**75.2**	**74.9**
3	DBW 71 (C)	77.5	77.0	75.0	76.0	**76.4**	79.0	78.0	72.3	**76.4**	**76.4**
4	HD 3271	74.5	73.5	76.0	75.3	**74.8**	75.0	75.0	70.0	**73.3**	**74.1**
5	WH 3272	76.0	73.5	75.0	73.7	**74.6**	75.6	72.0	69.6	**72.4**	**73.5**
6	WH 1232	76.0	74.0	72.5	75.6	**74.5**	7.5	71.0	71.0	**49.8**	**62.2**
7	WH 1233	77.0	75.0	72.0	77.0	**75.3**	75.0	71.2	72.6	**72.9**	**74.1**
8	PBW 757	79.0	77.5	78.0	77.2	**77.9**	78.0	78.3	72.5	**76.3**	**77.1**
9	PBW 778	76.5	77.5	75.5	73.6	**75.8**	76.0	73.0	69.5	**72.8**	**74.3**
10	PBW 779	78.0	75.5	76.5	75.6	**76.4**	77.0	78.3	73.2	**76.2**	**76.3**
11	DWB 249	75.5	76.0	72.0	76.2	**74.9**	80.7	79.0	77.0	**78.9**	**76.9**
12	DBW 250	76.5	75.5	70.0	76.0	**74.5**	78.2	70.0	70.7	**73.0**	**73.8**
13	DBW 251	72.5	73.5	71.0	73.0	**72.5**	74.3	71.0	68.5	**71.3**	**71.9**
	Mean	**76.3**	**75.3**	**74.3**	**75.5**	**75.3**	**72.0**	**75.1**	**72.2**	**73.1**	**74.2**

Table16: Protein Content (%) of *T.aestivum* genotypes in VLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	15.24	13.50	12.70	12.83	**13.57**	11.98	13.63	11.52	**12.38**	**12.97**
2	DBW 14 (C)	14.03	12.24	12.95	11.80	**12.76**	12.85	14.06	10.75	**12.55**	**12.65**
3	DBW 71 (C)	14.55	11.56	12.12	11.87	**12.53**	11.45	13.98	12.89	**12.77**	**12.65**
4	HD 3271	14.18	12.33	12.01	11.73	**12.56**	13.01	14.72	12.80	**13.51**	**13.04**
5	WH 3272	14.58	13.03	12.32	13.60	**13.38**	13.20	15.51	12.41	**13.71**	**13.54**
6	WH 1232	15.31	13.42	13.16	12.16	**13.51**	13.12	15.57	12.68	**13.79**	**13.65**
7	WH 1233	13.64	11.72	11.94	11.93	**12.31**	12.82	15.84	12.69	**13.78**	**13.05**
8	PBW 757	13.74	11.09	11.31	13.39	**12.38**	13.44	14.92	11.99	**13.45**	**12.92**
9	PBW 778	14.32	12.36	12.50	13.87	**13.26**	13.25	15.14	11.86	**13.42**	**13.34**
10	PBW 779	14.42	12.28	11.91	12.64	**12.81**	11.68	14.50	11.53	**12.57**	**12.69**
11	DWB 249	14.60	12.26	12.79	13.51	**13.29**	11.98	13.63	11.52	**12.38**	**12.83**
12	DBW 250	14.57	11.72	12.71	12.30	**12.83**	12.85	14.06	10.75	**12.55**	**12.69**
13	DBW 251	13.80	11.38	11.23	12.36	**12.19**	11.45	13.98	12.89	**12.77**	**12.48**
	Mean	**14.38**	**12.22**	**12.28**	**12.61**	**12.88**	**12.54**	**14.58**	**12.02**	**13.05**	**12.96**

Table 17: Grain Hardness Index of *T.aestivum* genotypes in VLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	88	63	87	76	**79**	84	72	77	**78**	**78**
2	DBW 14 (C)	83	62	80	65	**73**	71	56	57	**61**	**67**
3	DBW 71 (C)	90	71	93	81	**84**	87	70	74	**77**	**80**
4	HD 3271	82	67	81	65	**74**	71	55	52	**59**	**67**
5	WH 3272	57	39	74	52	**56**	55	44	35	**45**	**50**
6	WH 1232	78	56	80	61	**69**	75	57	57	**63**	**66**
7	WH 1233	92	69	87	78	**82**	86	72	60	**73**	**77**
8	PBW 757	87	73	90	88	**85**	88	75	73	**79**	**82**
9	PBW 778	86	72	84	73	**79**	85	58	61	**68**	**73**
10	PBW 779	82	77	90	78	**82**	85	76	80	**80**	**81**
11	DWB 249	85	71	92	76	**81**	81	69	67	**72**	**77**
12	DBW 250	97	87	93	92	**92**	92	86	80	**86**	**89**
13	DBW 251	95	80	92	85	**88**	91	78	76	**82**	**85**
	Mean	**85**	**68**	**86**	**75**	**79**	**81**	**67**	**65**	**71**	**75**

Table 18: Sedimentation Value (ml) of *T.aestivum* genotypes VLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	48	42	38	46	**44**	42	48	46	**45**	**45**
2	DBW 14 (C)	45	45	49	48	**47**	49	54	47	**50**	**49**
3	DBW 71 (C)	45	48	49	46	**47**	45	51	50	**49**	**48**
4	HD 3271	60	58	64	61	**61**	61	59	58	**59**	**60**
5	WH 3272	56	60	59	55	**58**	57	54	56	**56**	**57**
6	WH 1232	59	57	63	60	**60**	63	58	60	**60**	**60**
7	WH 1233	55	58	55	54	**56**	51	58	55	**55**	**56**
8	PBW 757	57	63	60	58	**60**	57	62	59	**59**	**60**
9	PBW 778	59	60	62	57	**60**	59	58	64	**60**	**60**
10	PBW 779	51	49	48	55	**51**	50	54	53	**52**	**52**
11	DWB 249	61	55	63	60	**60**	59	59	61	**60**	**60**
12	DBW 250	54	49	53	57	**53**	59	50	58	**56**	**55**
13	DBW 251	63	58	64	60	**61**	61	59	57	**59**	**60**
	Mean	**55**	**54**	**56**	**55**	**55**	**55**	**56**	**56**	**55**	**55**

Table 19: Moisture Content (%) of *T.aestivum* genotypes in VLS trial in NWPZ and NEPZ

Sr. No	Entry	NWPZ					NEPZ				Overall Mean
		Delhi	Ludhiana	Pantnagar	Hisar	Mean	Varanasi	Pusa	Sabour	Mean	
1	WR 544 (C)	8.49	9.43	7.71	10.36	**9.00**	9.81	12.79	12.24	**11.61**	**10.31**
2	DBW 14 (C)	8.89	9.62	7.78	10.69	**9.25**	9.74	12.78	12.48	**11.67**	**10.46**
3	DBW 71 (C)	8.63	9.50	9.27	10.36	**9.44**	9.84	12.70	12.03	**11.52**	**10.48**
4	HD 3271	8.74	9.36	8.73	10.73	**9.39**	9.28	12.41	12.08	**11.26**	**10.33**
5	WH 3272	8.27	9.18	7.48	10.44	**8.84**	9.53	12.57	11.99	**11.36**	**10.10**
6	WH 1232	8.84	9.65	7.74	10.61	**9.21**	9.65	12.39	12.11	**11.38**	**10.30**
7	WH 1233	9.34	9.68	8.19	10.59	**9.45**	9.90	12.57	12.25	**11.57**	**10.51**
8	PBW 757	8.79	9.64	8.94	10.47	**9.46**	9.73	12.65	12.31	**11.56**	**10.51**
9	PBW 778	9.06	9.61	8.49	10.52	**9.42**	9.94	12.51	12.33	**11.59**	**10.51**
10	PBW 779	9.06	10.09	8.37	10.70	**9.56**	9.91	12.67	12.25	**11.61**	**10.59**
11	DWB 249	8.84	9.54	7.80	10.67	**9.21**	9.87	12.62	12.34	**11.61**	**10.41**
12	DBW 250	8.81	9.77	8.45	10.51	**9.39**	9.94	12.48	12.05	**11.49**	**10.44**
13	DBW 251	9.00	9.80	7.97	10.73	**9.38**	9.93	12.58	12.54	**11.68**	**10.53**
	Mean	**8.83**	**9.61**	**8.22**	**10.57**	**9.31**	**9.77**	**12.59**	**12.23**	**11.53**	**10.42**

Table 20: Grain appearance(Max-10) of *T.aestivum* in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		6.2	6.4	6.5	5.9	6.7	**6.3**
2.	HD 2967 (C)		6.7	6.3	6.2	6.5	6.5	**6.4**
3.	DBW 88 (C)		6.5	6.4	6.5	6.3	6.7	**6.5**
4.	WH 1105 (C)		6.6	6.6	6.3	6.2	6.7	**6.5**
5.	HD 3086 (C)		6.9	6.9	6.5	6.4	7.1	**6.8**
6.	PBW 779		6.9	6.7	6.6	6.0	7.2	**6.7**
7.	PBW 780		6.8	6.8	6.4	6.1	7.0	**6.6**
	Mean		**6.7**	**6.6**	**6.4**	**6.2**	**6.8**	**6.5**

Table 21: Test Weight (kg/hl) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		80.0	82.0	81.7	76.8	80.5	**80.2**
2.	HD 2967 (C)		82.0	79.0	82.0	79.0	78.0	**80.0**
3.	DBW 88 (C)		79.0	81.4	82.0	80.0	77.0	**79.9**
4.	WH 1105 (C)		81.5	81.0	81.0	76.5	79.5	**79.9**
5.	HD 3086 (C)		81.0	81.0	81.0	78.0	81.5	**80.5**
6.	PBW 779		81.5	80.6	82.0	77.6	83.0	**80.9**
7.	PBW 780		80.0	80.3	80.6	79.5	80.0	**80.1**
	Mean		**80.7**	**80.8**	**81.5**	**78.2**	**79.9**	**80.2**

Table 22: Protein Content (%) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		10.77	12.33	10.61	13.14	9.90	**11.35**
2.	HD 2967 (C)		12.15	11.91	8.33	13.71	9.18	**11.06**
3.	DBW 88 (C)		10.30	12.16	9.92	12.89	11.21	**11.30**
4.	WH 1105 (C)		10.46	11.66	9.38	12.55	10.36	**10.88**
5.	HD 3086 (C)		10.49	11.64	9.96	12.74	11.96	**11.36**
6.	PBW 779		12.43	13.08	11.31	14.63	11.03	**12.50**
7.	PBW 780		11.49	11.33	8.87	12.40	9.11	**10.64**
	Mean		**11.16**	**12.02**	**9.77**	**13.15**	**10.39**	**11.30**

Table 23: Grain Hardness Index of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		79	82	96	86	76	**84**
2.	HD 2967 (C)		75	80	81	86	72	**79**
3.	DBW 88 (C)		76	76	85	78	78	**79**
4.	WH 1105 (C)		72	72	69	83	71	**74**
5.	HD 3086 (C)		74	84	83	81	70	**78**
6.	PBW 779		85	85	102	86	80	**88**
7.	PBW 780		79	76	83	85	72	**79**
	Mean		**77**	**79**	**85**	**84**	**74**	**80**

Table 24: Sedimentation Value (ml) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		50	49	54	59	55	**53**
2.	HD 2967 (C)		60	55	59	62	58	**59**
3.	DBW 88 (C)		60	59	62	61	60	**60**
4.	WH 1105 (C)		60	63	61	59	63	**61**
5.	HD 3086 (C)		58	63	59	62	58	**60**
6.	PBW 779		58	54	57	56	62	**57**
7.	PBW 780		63	58	60	61	58	**60**
	Mean		**58**	**57**	**59**	**60**	**59**	**59**

Table 25: Moisture Content (%) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		9.25	8.57	10.36	8.68	7.92	**8.96**
2.	HD 2967 (C)		9.17	8.46	10.52	8.43	7.55	**8.83**
3.	DBW 88 (C)		9.33	8.39	10.67	8.26	7.78	**8.89**
4.	WH 1105 (C)		9.1	8.7	10.58	8.28	7.54	**8.84**
5.	HD 3086 (C)		9.18	8.49	10.61	9.73	7.89	**9.18**
6.	PBW 779		9.23	8.81	10.63	8.22	7.81	**8.94**
7.	PBW 780		9.05	8.25	10.47	8.11	7.53	**8.68**
	Mean		**9.19**	**8.52**	**10.55**	**8.53**	**7.72**	**8.90**

Table 26: Iron Content (ppm) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		35.5	36.6	36.5	39.9	36.7	**37.0**
2.	HD 2967 (C)		38.1	37.2	36.6	41.7	35.5	**37.8**
3.	DBW 88 (C)		33.9	40.3	38.7	39.6	31.6	**36.8**
4.	WH 1105 (C)		36.8	43.9	37.8	38.7	34.3	**38.3**
5.	HD 3086 (C)		35.1	40.1	40.5	39.8	41.6	**39.4**
6.	PBW 779		35.3	35.9	39.2	43.8	35.1	**37.9**
7.	PBW 780		38.1	36	34.3	37.9	30	**35.3**
	Mean		**36.1**	**38.6**	**37.7**	**40.2**	**35.0**	**37.5**

Table 27: Zinc Content (ppm) of *T.aestivum*in MABB Trialin NWPZ

Sr. No	Variety	Code	Ludhiana	Delhi	Pantnagar	Durgapura	Hisar	Mean
Irrigated, Timely Sown								
1.	PBW 550 (C)		33.2	45.2	27.0	46.0	42.5	**38.8**
2.	HD 2967 (C)		33.7	48.5	25.1	51.1	40.1	**39.7**
3.	DBW 88 (C)		31.4	40.2	28.8	39.8	37.9	**35.6**
4.	WH 1105 (C)		25.2	48.0	24.3	44.8	46.0	**37.7**
5.	HD 3086 (C)		24.8	39.1	25.0	42.9	41.8	**34.7**
6.	PBW 779		32.1	46.5	24.9	50.1	42.1	**39.1**
7.	PBW 780		33.2	41.4	24.6	40.5	31.8	**34.3**
	Mean		**30.5**	**44.1**	**25.7**	**45.0**	**40.3**	**37.1**

SECTION D

NURSERIES

i. **Quality Component Screening Nursery (QCSN)**

ii. **National Wheat Nurseries**

- **NGSN**
- **EIGN**
- **NDSN**

Quality Component Screening Nursery (QCSN)

The nursery constituted to select useful donors for quality improvement was planted at 12 locations to evaluate 56 entries in comparison to three checks namely HI 977, PDW 233 (durum) and UP 2672 (Table 1). Field conduct was satisfactory at majority of the test sites. Grain quality analysis was done at IIBWR, Karnal and the parameters involved were grain protein content at 14% grain moisture level, test weight (hectolitre weight), sedimentation volume, grain appearance score and grain hardness index (Table 1). Samples were not received from Varanasi centre; therefore this location was excluded in the pooled analysis.

Table 1: Overall field performance at test sites

Location	Plot size (m^2)	Sowing date	Grain yield (g/m^2)	Height (cm)	Heading (days)	1000 grain weight (g)
Almora	2.00	Nov.16	505	95	121	45.9
New Delhi	3.75	Nov.24	342	99	91	39.3
Karnal	3.60	Nov.15	535	104	91	45.4
Ludhiana	3.75	Nov.16	370	94	80	38.5
Durgapura	3.75	Nov.15	287	96	77	40.7
Pantnagar	2.50	Nov.11	476	103	89	41.5
Varanasi	3.00	Nov.15	277	93	67	38.9
Pusa	3.75	Nov.15	427	99	80	40.0
Vijapur	3.75	Nov.07	222	86	59	41.0
Junagarh	3.00	Nov 17	488	80	56	41.0
Pune	3.00	Nov. 18	305	77	61	41.7
Dharwad	1.60	Nov.05	368	78	60	38.4

Location specificity: Test weight was high (81kg/hl) at Karnal and Junagarh but it dropped to 77 kg/hl at Pusacentre (Table 2). Average protein content was highest at Pusa and Pune (13.5- 13.8%), and lowest at Pantnagar and Ludhiana (10-11%). Junagarh, Karnal and Almoracentres registered high protein yield (63-65g/m^2). There were not wide differences in sedimentation value still difference could be observed between locations showing high (Junagarh and Alomra: 53ml) and poor gluten strength (Durgapura: 49ml). Grain appearance was best (score: 6.6) at Junagarh and poorest at Pusa (score: 6.0). Average grain hardness index was high (73-74) at four locations namely Junagarh, Delhi, Pantnagar and Karnal whereas it was just 58 at Ludhiana.

Table 2: Overall quality characteristics at test sites

Locations	Test wt. (kg/hl)	Protein (%)	Protein yield (g/m^2)	Sedimentation value (ml)	Hardness Index	Grain look (score)
Almora	79.9	12.2	62.7	53	68	6.2
New Delhi	78.4	12.9	43.8	52	73	6.4
Karnal	81.1	11.7	63.6	52	73	6.5
Ludhiana	78.8	11.4	42.2	51	58	6.3
Durgapura	77.5	12.4	35.6	49	66	6.2
Pantnagar	80.5	10.2	48.3	52	73	6.2
Pusa	77.2	13.2	56.3	52	67	6.0
Vijapur	79.8	13.5	30.6	51	74	6.4
Junagarh	81.3	13.3	64.9	53	71	6.6
Pune	80.8	13.8	41.4	51	70	6.3
Dharwad	79.7	12.5	46.3	52	71	6.3

Genetic superiority: Statistical analysisrevealed highly significant genotypic differences (*P <0.001*) in all quality parameters. Significant differences could also be observed in the economic parameters like plant height and grain weight. Several new entries registered superiority in grain quality parameters and their list is presented in Table 3. Detailed information of all test entries is presented in Table 4.

Table 3: Most promising genotypes for individual quality parameter

Component	Genotypes	Range	Check
Protein content (%)	BWL 1660, BWL 1664, QLD 46	14.0-14.5	UP 2672: 13.2
Protein yield (g/m^2)	QLD 67, QLD 89, RAJ 4093	57-59	HI 977: 49.2
Sedimentation value(ml)	QLD 76, BW 5872, HD 3215, UP 2958, QLD 78, UP 2927	61-62	HI 977: 62
Grain hardness index	Hard wheat: GW 2015-703 (d), QLD 89, GW 2015-609 (d), UP 2959 Soft wheat: QLD84, QLD49, QLD73, QLD67	89-91 18-26	PDW 233: 91 HI 977: 76
Test weight (kg/hl)	Bread wheat: JWS 733, RAJ 4494 Durum wheat: GW 2015-699, GW 2015-691	81.5-82.0 82.0-82.1	HI 977: 80.5 PDW 233:80.5
Grain appearance score out of 10	Bread wheat: QLD 46, GW 2015-660, JWS 733, QLD 89, UP 2958 Durum wheat: GW 2014-603,GW 2015-691 GW 2015-705	6.5-6.6 7.0-7.1	HI 977:6.4 PDW 233: 6.6

Grain protein content: There were wide differences in grain protein content (11.5 to 14.5%) and it was ≥13% in 20 test entries. In comparison to the best check UP 2672 (13.2%), four new test entries (listed in Table 3) recorded GPC ≥14%.

Protein yield: Range in protein yield was also quite wide (39 to 59g/m^2). In comparison to best check HI 977 (49g/m^2), 11 entries recorded protein yield in the range 55-59g/m^2. Top three entries with protein yield 57-59g/m^2 are given in Table 3.

Grain hardness index: Variability range in grain hardness index was quite large (18 to 91). It was highest (91) in two durum entries namely GW 2015-703 and PDW 233 (d). In the bread wheat category, entries with index 84 were QLD 89 UP 2959. There were seven soft grain QLD entries with hardness score in the range 18-30.

Test weight: Itvaried between 76 to 82kg/hl in the test entries. 24 genotypes expressed test weight in the range 81-82kg/hl out of which five belonged to the durum category. Entries with test weight 82.0 kg/hl are listed in Table 3.

Sedimentation value: Entriesin the QCSN expressed big range in sedimentation value (28 to 62ml). 12 entries, including best check HI 977, registered ≥60ml sedimentation value. Entries with sedimentation value 6-162ml are listed in Table 3.

Grain appearance score: The range in grain appearance score was 5.9 to 7.1. 11 entries showed grain appearance score ≥6.5 out of which five were durum wheat. Average score in three top durum entries was 7.0 whereas mean score in top bread wheat entries was 6.5 to 6.6 (Table 3).

Agronomic traits: Yield in the best checks PDW 233(d) and HI 977 was 405g/m^2 and in comparison, 14 entries, including two durum lines, registered mean yield ≥430gm^2. Top two grain yielders were QLD 89 and HD 3242. Some bread wheat entries were very tall (107-112cm) like QLD 46, BWL 1664, BWL 1660. Average days to heading period in the test material was 70-88 days. QLD 80 and QLD 86 were late in heading (90-92 days) whereas BWL 1660, BWL 1664, QLD 54 and PHS 2014-03 came to heading in 73-88 days. Variations in 1000 grain weight were very large (37-55g). TGW in two durum lines namely GW 2014-603 and GW 2014-705 was.52-55g. Bread wheat entries with TGW 45-48g were GW 2014-596, QLD 46, QLD 67 and QLD 73.

Table 4: Overall performance of the test entries

Sr. No.	Genotypes	GAS	TGW (g)	TW (kg/hl)	GPC (%)	SV (ml)	GHI	Yield (g/m^2)	PTY (g/m^2)	HT (cm)	HD (days)
1	BW-5872 [l]	6.2	38.8	79.4	12.0	61	80	432	51.8	91	79
2	BWL-1660	6.4	40.6	79.9	14.5	59	64	301	43.5	107	71
3	BWL-1664	6.4	39.5	80.0	14.4	60	66	284	40.8	109	70
4	GW 2014-596	6.3	47.7	79.2	13.5	48	70	294	39.5	98	75
5	GW 2014-603 [d]	7.1	55.0	80.7	13.4	39	80	391	52.2	77	72
6	GW 2014-615	6.4	39.1	80.8	11.5	58	79	412	47.4	85	74
7	GW 2015-660	6.5	38.5	81.3	11.9	53	80	330	39.2	86	72
8	GW 2015-661	6.4	42.7	80.2	12.4	58	75	370	45.8	89	70
9	GW 2015-663	6.4	41.3	80.6	13.0	58	77	422	54.8	102	70
10	GW 2014-691 [d]	7.0	46.8	82.0	12.4	39	82	431	53.4	79	72
11	GW 2014-693 [d]	6.8	45.3	77.8	12.5	39	88	364	45.4	79	71
12	GW 2014-699 [d]	6.7	45.1	82.1	12.9	38	89	337	43.4	84	74
13	GW 2014-703 [d]	6.3	40.3	81.4	11.6	30	91	435	50.3	89	79
14	GW 2014-705 [d]	7.0	51.7	81.1	12.1	28	88	417	50.3	89	79
15	HD 3210	6.3	40.5	80.2	12.4	60	74	369	45.9	96	76
16	HD 3215	6.2	38.4	79.4	12.3	61	78	444	54.6	96	79
17	HD 3241	6.3	43.8	80.0	12.8	60	67	432	55.4	97	76
18	HD 3242	6.3	43.2	80.8	11.9	59	74	477	56.5	99	74
19	HUW 1522	6.3	37.9	78.5	12.2	55	79	353	42.9	93	71
20	HUW 1525	6.2	36.7	79.4	12.2	53	77	431	52.5	86	71
21	JWS 733	6.5	39.3	82.0	12.4	50	79	385	47.7	88	75
22	JWS 810	6.4	37.9	80.7	12.9	53	76	350	45.2	102	88
23	QBP-12-9 [l]	6.0	39.0	80.0	12.1	41	32	431	52.0	91	84
24	QLD 79	6.2	41.2	77.7	12.7	46	78	351	44.7	94	81
25	QLD 80	5.9	36.6	77.0	12.9	58	30	394	50.6	94	86
26	QLD 82	6.0	40.1	80.1	12.3	53	29	419	51.4	89	83
27	QLD 83	6.0	39.0	78.6	12.2	45	41	429	52.5	85	83
28	QLD 84	5.9	40.6	76.0	13.6	58	18	357	48.6	87	84
29	QLD 85	6.1	38.1	79.0	13.0	55	77	421	54.8	85	85
30	QLD 87	6.2	43.8	78.2	13.3	43	74	399	52.9	88	84
31	QLD 88	6.2	38.7	79.0	12.1	45	80	412	50.0	87	83
32	QLD 89	6.5	40.1	80.1	12.3	59	84	480	59.1	101	82
33	QLD 90	6.4	41.6	80.7	12.8	57	74	396	50.8	94	86
34	QLD 91	6.2	41.5	79.7	13.4	58	68	415	55.7	95	82
35	QLD 92	6.4	39.1	79.9	12.9	52	80	406	52.4	89	78
36	QLD 93	6.3	41.1	79.9	12.3	60	72	434	53.2	98	79
37	QLD 94	6.3	42.9	80.0	12.5	60	72	443	55.5	100	79
38	QLD-11 [l]	5.9	39.3	80.6	13.9	42	70	342	47.4	92	83
39	QLD-46	6.6	45.1	80.5	14.1	56	56	291	41.1	112	82
40	QLD-49 [l]	6.0	37.2	79.4	13.5	54	21	395	53.2	96	74

Cont.

Sr. No.	Genotypes	GAS	TGW (g)	TW (kg/hl)	GPC (%)	SV (ml)	GHI	Yield (g/m^2)	PTY (g/m^2)	HT (cm)	HD (days)
41	QLD-54 [I]	6.0	40.0	78.4	13.6	42	30	381	51.7	90	71
42	QLD-67	6.1	45.6	79.0	13.4	46	26	444	59.5	92	75
43	QLD-70	6.4	40.1	81.3	13.2	59	72	389	51.2	91	84
44	QLD-71	6.3	41.2	81.0	13.3	57	73	407	54.0	91	83
45	QLD-73	6.1	44.6	79.3	12.9	45	23	434	56.0	96	87
46	QLD-76	6.3	39.9	81.2	11.9	62	79	422	50.4	95	84
47	QLD-78	6.3	38.8	81.0	13.7	61	64	348	47.8	90	84
48	RAJ 4476	6.4	40.9	81.1	12.6	53	78	375	47.4	94	74
49	RAJ 4493	6.3	40.3	81.2	12.7	47	77	447	56.6	86	71
50	RAJ 4494	6.1	42.8	81.5	12.6	48	38	426	53.6	92	74
51	RAJ 4496	6.2	40.8	80.5	12.3	51	79	369	45.5	85	70
52	RAJ 4500	6.0	42.1	76.5	12.5	46	67	391	48.9	94	80
53	RAJ 4501	6.3	44.4	80.3	12.3	41	77	398	49.0	92	83
54	UP 2927	6.3	37.0	80.1	13.0	61	78	399	51.7	98	81
55	UP 2958	6.5	41.4	80.5	12.6	61	77	429	54.0	91	79
56	UP 2959	6.3	37.8	78.4	13.1	58	84	386	50.5	93	85
57	UP 2672 [C]	6.4	40.8	79.9	13.2	58	74	347	45.8	89	78
58	HI-977 [C]	6.4	41.2	80.5	12.1	62	76	405	49.2	91	78
59	PDW 233 [C]	6.6	40.5	80.5	12.0	41	91	404	48.3	88	86
	Overall mean	6.3	41.3	79.9	12.7	52	68	395	50.1	92	78
	CD (P 0.05)	0.3	3.7	1.8	1.2	3	6	NS	NS	10	NS
	CV (%)	4.94	10.7	2.74	10.8	6.53	9.87	32.4	30.8	12.8	25.0

GAS: grain appearance score, TW: test weight, GPC: grain protein content at 14% grain moisture,
SV: sedimentation value, GHI: grain hardness index, PTY: protein yield, HT: plant height, HD: heading days

Disease incidence: Incidence of black rust was reported from four centres but the incidence was mild. Only few entries expressed symptoms at Vijapur location and the maximum score was limited to 10MS. Brown rust was reported in traces from Vijapur and Junagarh. Few entries expressed 20 to 30S incidence of leaf rust at Almora and the genotypes with 30S reaction were QLD 87, GW 2014-615 and BWL 1660. Yellow rust was spotted at four centres namely Alomra, Pantnanagr, Karnal and Ludhiana. Many entries expressed susceptible reactions to yellow rust and the most susceptible amongst them (≥40S reaction at two or more locations) were GW 2014-596, GW 2014-615, GW 2015-661, GW 2015-661, HD 3215, UP 2959, QLD 80, QLD 84, RAJ 4476. Few other entries registered 20 to 40S yellow rust score at 2-3 locations like GW 2014-615, GW 2015-663, HD 3215, QLD 88 and UP 2672 (check).

Utilization: Utilization report was received from eight centres namely Almora, Pantnagar, Ludhiana, Durgapura, Vijapur, Junagarh, Dharwad and Pune. Except 8, all test entries were either utilized or retained as genetic resource. The most preferred entries in the field were QBP 12-9, QLD 76 and QLD 82 as they were picked by five centres. Few more entries like QLD 70, QLD 76, QLD 85, HUW 1512 and RAJ 4476 were retained for utilization in the crossing program at three test sites.

New genetic stocks: 11 entries completed three years testing in QCSN and their mean performance (11 centres per year) was compared with the checks and the recently identified genetic resources (Table 5). On the basis of 33 data points, two derivatives of the cross PBW 554/ PBW 343// 11th WAWSN 38 namely QLD 67 and QLD 73 were identified for grain softness. Both had grain hardness index ~25 and their test weight (~ 78.5kg/hl), 1000 grain weight (~45g), sedimentation value (44ml), grain appearance score (~ 6.0) and protein yield (53g/m^2) was also similar. Difference however lied in protein content (QLD 67:13.1%, QLD 73:12.6%). QLD 67 was early flowering as heading in this genotype came 10 days earlier in comparison to QLD 73 (86 days).

Table 5: Three years average performance of newly identified genetic resources

Overall mean	GPC (%)	PY (g/m2)	TGW (g)	TW (kg/hl)	SV (ml)	Hardness index	GAS	YLD (g/m^2)	HT (cm)	HD (days)
Soft grain										
QLD-67	13.1	52.3	45.3	78.6	44	25	6.0	401	92	76
QLD-73	12.6	52.7	44.6	78.4	44	24	5.9	416	95	86
QBP-12-9 [I]	12.1	50.3	39.5	78.9	39	28	5.8	417	91	84
QLD-49 [I]	13.3	48.0	36.3	78.2	50	20	5.8	361	94	76
QLD-54 [I]	13.5	48.5	40.0	77.4	39	28	5.9	362	88	73
Sedimentation value										
QLD-76	11.8	46.1	39.7	79.9	60	75	6.1	390	96	85
QLD-78	13.3	47.7	39.5	80.1	60	60	6.2	360	92	85
BW-5872 [I]	12.2	49.6	38.2	77.9	58	76	6.1	402	91	81
HI-977 [C]	12.3	44.4	40.2	79.0	58	72	6.2	363	92	80
Grain protein content at 14% grain moisture										
QLD-46	13.9	46.8	45.8	79.9	50	54	6.5	338	111	82
BWL-1660	14.1	43.9	40.5	79.5	56	63	6.4	311	107	72
BWL-1664	14.2	43.3	39.3	79.0	55	64	6.3	308	108	72
QLD-11[I]	13.6	46.6	39.0	79.7	41	66	5.8	342	93	86
UP-2672 [C]	13.2	42.5	42.1	79.3	54	70	6.2	322	89	79

Two entries namely QLD 76 and QLD 78 registered high sedimentation value (60ml) in comparison to the best check HI 977 and identified entry BW 5872 (58ml). These two genotypes i.e. QLD 76 and QLD 78 were identified as genetic resource for sedimentation value. Both the derivatives were developed at IIWBR by crossing the exotic collections (QLD 76: 12th HRWYT 02/ 21st SAWSN 05 and QLD 78: 36th IBWSN 101/ 36th IBWSN 138). Besides similar sedimentation value (60ml), both genotypes had good test weight (80kg/hl), 1000 grain weight (40g) and grain appearance (score: 6.1-6.2). However, QLD 76 had higher grain hardness index (75) in comparison to QLD 78 (60). QLD 78 exerted superiority in GPC (13.3%) as QLD 76 expressed moderate protein level (11.8%)

For grain protein content, three entries namely QLD 46, BWL 1160 and BWL 1164 were found highly promising. Although they were slightly tall (1078-111cm) but grain protein content was high (13.9-14.2%). QLD 46 was developed at IIWBR from an introduction i.e. 8th EGPSN 22 (NL 665/OPAT 85//NL 836). BWL 1660 and BWL 1664 belonged to PAU, Ludhiana and were found exactly similar. On the basis of three years performance, QLD 46 and BWL 1660 were identified as genetic resource for protein. QLD 46 registered 13.9% protein content and the grains were also bold (TGW: 46g). Its test weight (79.9 kg/hl) and grain appearance (score: 6.5) was also good but sedimentation value (50ml) was moderate. Yield levels in QLD 46 were higher than BWL 1660 and its plant height was 111cm. In comparison, BWL 1660 had GPC: 14.1%, test weight: 79.5kg/hl, grain hardness index: 63, grain appearance score: 6.4 and TGW: 43.9g. Although BWL 1660 was tall (107cm) and yielded less (311g/m2) in comparison to QLD 46, it flowered 10 days earlier (heading days: 72) in comparison to QLD 46.

Preliminary screening: At Karnalcentre, 60 new genotypes contributed by the co-operators were evaluated to select entries for multilocation testing. Five entries in this lot had grain protein content in the range 14.4 to 15.3%. Majority of the lines expressed test weight ≥80 kg/hl and four entries amongst them registered ≥84kg/hl test weight. 12 entries showed grain appearance score in the range 7.0 to 7.7. There were many entries (15 genotypes) with sedimentation value 60-65ml. Hard grain genotypes with grain hardness index 90-99 could be also be observed in the test material. List of the elite entries in this screening is presented in Table 6. Depending upon the disease reactions and yield traits, some of them might be promoted for multilocation testing in the coming year.

Table 6: Promising genotypes noted in preliminary screening

Component	Genotypes	Range
Protein content (%)	GW 2016-772 (d), UP 2994, JWS 819, JWS 855, GW 2016-775 (d),	13.3-14.7
Sedimentation value(ml)	UP 2995, UP 2996, Local collection 1c 01, JWS150, JWS 809	63-65
Grain hardness index	GW 2016-772, 775, 778 & 794, HI 8790, TAW 33, UP 2997, Local collection 1c 01, HI 8777	90-99
Test weight (kg/hl)	GW 2016-793 (d), GW 2016-731, GW 2016-741 & 746	83.5-84.0
Grain appearance score out of 10	GW 2016-773 (d), GW 2016-794 (d), AKAW 4894, AKAW 5012, DWAP 1621	7.4-7.7

Table 7: Grain Appearance (Max-10) of Quality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**6.2**	6.2	6.0	6.4	5.8	6.2	**6.1**	**6.0**	6.3	6.0	**6.2**	6.3	6.1	**6.2**	**6.2**
2.	QLD-11 (I)	**6.0**	6.0	5.9	6.0	5.7	6.0	**5.9**	**5.6**	6.0	6.0	**6.0**	5.6	5.7	**5.7**	**5.9**
3.	UP-2672 (C)	**6.3**	6.3	5.8	6.1	6.1	6.1	**6.1**	**5.9**	6.6	6.5	**6.6**	6.4	6.3	**6.4**	**6.3**
4.	QLD-46	**6.4**	6.4	6.4	6.7	6.4	6.9	**6.6**	**5.6**	6.8	6.6	**6.7**	6.7	6.4	**6.6**	**6.6**
5.	QLD-49 (I)	**5.7**	6.3	5.6	5.8	5.7	6.2	**5.9**	**5.6**	6.0	6.4	**6.2**	6.1	6.0	**6.1**	**6.0**
6.	QLD-54 (I)	**5.5**	6.1	6.1	6.3	6.3	6.4	**6.2**	**6.0**	6.1	6.3	**6.2**	5.8	6.2	**6.0**	**6.0**
7.	QLD-67	**6.0**	6.3	5.8	6.4	5.6	6.7	**6.2**	**6.1**	6.4	6.2	**6.3**	6.3	5.7	**6.0**	**6.1**
8.	QBP-12-9	**5.8**	6.8	5.5	6.3	6.0	6.4	**6.2**	**5.9**	6.3	5.9	**6.1**	6.2	5.8	**6.0**	**6.0**
9.	HI-977 (C)	**6.5**	5.9	5.6	6.3	6.2	6.5	**6.1**	**5.7**	7.0	6.4	**6.7**	6.6	6.2	**6.4**	**6.4**
10.	QLD-70	**6.3**	6.4	6.3	6.4	6.1	6.8	**6.4**	**6.2**	6.5	6.7	**6.6**	6.3	6.3	**6.3**	**6.4**
11.	QLD-71	**6.1**	6.3	6.4	6.5	6.5	6.5	**6.4**	**6.2**	6.6	6.4	**6.5**	6.2	6.4	**6.3**	**6.3**
12.	QLD-73	**6.0**	6.1	5.8	6.3	6.0	6.2	**6.1**	**6.0**	6.2	6.2	**6.2**	5.9	6.0	**6.0**	**6.1**
13.	QLD-76	**6.3**	6.1	6.3	6.4	6.3	6.4	**6.3**	**5.9**	6.5	6.3	**6.4**	6.2	6.3	**6.3**	**6.3**
14.	QLD-78	**6.2**	6.1	6.1	6.5	6.3	6.2	**6.2**	**5.8**	6.4	6.5	**6.5**	6.4	6.4	**6.4**	**6.3**
15.	BWL-1660	**6.2**	6.2	6.4	6.4	6.6	6.2	**6.4**	**6.3**	6.6	6.5	**6.6**	6.5	6.6	**6.6**	**6.4**
16.	BWL-1664	**6.0**	6.3	6.3	6.7	6.7	6.8	**6.6**	**6.2**	6.5	6.7	**6.6**	6.7	6.5	**6.6**	**6.4**
17.	HD 3210	**6.2**	6.2	6.0	6.2	6.0	6.3	**6.1**	**5.7**	6.5	6.5	**6.5**	6.2	6.9	**6.6**	**6.3**
18.	UP-2672	**6.1**	5.8	6.2	6.4	6.3	5.2	**6.0**	**5.6**	7.1	6.4	**6.8**	6.3	6.3	**6.3**	**6.3**
19.	PDW-233 (C)	**6.4**	6.1	6.3	6.6	6.3	6.5	**6.4**	**6.2**	7.0	5.8	**6.4**	7.0	6.6	**6.8**	**6.5**
20.	GW 2014-596	**6.2**	6.3	5.4	6.8	6.4	6.3	**6.2**	**5.8**	6.7	6.5	**6.6**	6.4	6.3	**6.4**	**6.3**
21.	GW 2014-615	**6.3**	6.1	5.6	5.7	6.2	6.4	**6.0**	**6.2**	7.2	6.8	**7.0**	6.4	6.5	**6.5**	**6.4**
22.	HD 3215	**6.0**	6.3	6.2	5.8	6.4	6.5	**6.2**	**5.7**	6.5	6.3	**6.4**	6.2	6.4	**6.3**	**6.2**
23.	UP 2958	**6.4**	6.4	6.3	6.4	6.3	6.7	**6.4**	**6.1**	6.9	6.5	**6.7**	6.3	6.4	**6.4**	**6.5**
24.	UP 2959	**6.4**	6.3	6.5	6.2	6.4	6.3	**6.3**	**6.2**	6.3	6.1	**6.2**	6.3	6.4	**6.4**	**6.3**
25.	HI-977 (C)	**6.3**	6.0	6.2	6.5	6.3	6.2	**6.2**	**6.0**	6.7	6.8	**6.8**	6.6	6.6	**6.6**	**6.5**
26.	QLD 79	**6.0**	5.8	6.3	6.4	6.2	6.4	**6.2**	**5.8**	6.4	6.2	**6.3**	6.2	6.3	**6.3**	**6.2**
27.	QLD 80	**6.1**	5.9	6.0	6.0	5.7	5.9	**5.9**	**5.5**	6.3	5.6	**6.0**	5.5	6.1	**5.8**	**5.9**
28.	QLD 82	**6.0**	6.0	6.0	6.1	6.1	6.3	**6.1**	**5.6**	6.4	5.9	**6.2**	5.6	5.9	**5.8**	**6.0**
29.	QLD 83	**5.7**	5.7	5.9	6.3	5.5	6.2	**5.9**	**5.4**	6.6	6.3	**6.5**	6.0	5.7	**5.9**	**6.0**
30.	QLD 84	**5.5**	6.1	6.0	6.0	5.7	6.3	**6.0**	**6.0**	6.2	6.0	**6.1**	5.9	6.0	**6.0**	**5.9**
31.	QLD 85	**6.1**	6.3	6.4	6.4	6.1	6.4	**6.3**	**6.0**	6.4	5.8	**6.1**	5.8	6.2	**6.0**	**6.1**
32.	QLD 87	**6.2**	6.1	6.2	6.6	6.4	6.6	**6.4**	**6.2**	6.3	5.9	**6.1**	6.0	6.2	**6.1**	**6.2**
33.	QLD 88	**6.1**	6.2	6.2	6.3	6.2	6.4	**6.3**	**6.1**	6.7	5.5	**6.1**	6.3	6.1	**6.2**	**6.2**
34.	QLD 89	**6.2**	6.4	6.3	7.0	6.4	6.6	**6.5**	**6.3**	6.8	6.4	**6.6**	6.6	6.5	**6.6**	**6.5**
35.	UP-2672 [C]	**6.0**	6.2	6.4	6.2	6.3	6.5	**6.3**	**6.2**	7.1	6.3	**6.7**	6.3	6.4	**6.4**	**6.3**
36.	RAJ 4476	**6.3**	6.3	6.0	6.3	6.4	6.8	**6.4**	**6.0**	6.6	6.7	**6.7**	6.4	6.3	**6.4**	**6.4**
37.	JWS 733	**6.3**	6.2	6.1	6.4	6.2	6.6	**6.3**	**6.2**	6.5	7.3	**6.9**	6.5	6.4	**6.5**	**6.5**
38.	JWS 810	**6.3**	6.1	6.3	6.5	6.3	6.5	**6.3**	**6.0**	6.9	6.3	**6.6**	6.4	6.6	**6.5**	**6.4**
39.	HD 3241	**6.1**	6.5	6.3	6.2	6.1	6.6	**6.3**	**5.9**	6.5	6.4	**6.5**	6.3	6.3	**6.3**	**6.3**
40.	HD 3242	**6.0**	6.6	6.2	6.4	6.4	7.2	**6.6**	**6.3**	6.5	6.3	**6.4**	6.2	6.4	**6.3**	**6.3**
41.	PDW 233 (C)	**6.1**	6.5	6.3	6.9	6.2	6.8	**6.5**	**6.4**	7.3	6.2	**6.8**	6.5	6.7	**6.6**	**6.5**
42.	GW 2015-660	**6.3**	6.4	5.6	6.2	6.5	6.4	**6.2**	**6.1**	7.2	6.8	**7.0**	6.4	6.7	**6.6**	**6.5**
43.	GW 2015-661	**6.1**	6.6	5.7	5.8	6.4	6.4	**6.2**	**6.2**	6.5	6.7	**6.6**	6.5	6.8	**6.7**	**6.4**
44.	GW 2015-663	**6.2**	6.7	6.4	6.2	6.6	7.3	**6.6**	**6.3**	7.3	6.6	**7.0**	6.4	5.5	**6.0**	**6.4**
45.	HI-977 (C)	**6.4**	6.4	6.3	6.4	6.4	6.4	**6.4**	**5.8**	6.7	6.5	**6.6**	6.5	6.3	**6.4**	**6.4**
46.	PDW 233 (C)	**6.5**	6.2	6.8	6.9	6.0	6.6	**6.5**	**5.7**	7.2	6.7	**7.0**	7.2	6.6	**6.9**	**6.7**
47.	GW 2014-603 (D)	**6.8**	6.8	7.2	7.3	7.2	7.6	**7.2**	**6.2**	7.4	7.5	**7.5**	7.3	6.3	**6.8**	**7.1**
48.	GW 2015-691 (D)	**6.7**	6.3	7.2	7.4	6.3	7.4	**6.9**	**6.3**	7.6	7.3	**7.5**	7.5	6.7	**7.1**	**7.0**
49.	GW 2015-693 (D)	**6.2**	6.6	7.0	7.2	6.8	7.5	**7.0**	**6.2**	7.5	7.2	**7.4**	7.0	6.4	**6.7**	**6.8**
50.	GW 2015-699 (D)	**6.2**	6.0	7.1	7.4	6.4	6.6	**6.7**	**6.0**	7.3	7.4	**7.4**	6.4	6.8	**6.6**	**6.7**
51.	GW 2015-703 (D)	**5.7**	5.8	6.6	7.6	6.1	6.3	**6.5**	**6.2**	6.9	6.1	**6.5**	6.4	6.4	**6.4**	**6.3**
52.	GW 2015-705 (D)	**6.8**	7.2	6.2	7.8	6.9	7.6	**7.1**	**6.4**	7.5	7.3	**7.4**	6.9	6.2	**6.6**	**7.0**
53.	UP-2672 (C)	**6.2**	6.3	6.9	6.3	6.2	6.4	**6.4**	**6.2**	7.2	6.3	**6.8**	6.4	6.5	**6.5**	**6.5**
54.	QLD 90	**6.2**	6.0	6.4	7.3	6.4	6.3	**6.5**	**6.0**	6.5	6.4	**6.5**	6.5	6.7	**6.6**	**6.4**
55.	QLD 91	**6.0**	6.4	6.7	6.6	6.5	6.4	**6.5**	**5.9**	6.2	6.4	**6.3**	6.3	6.0	**6.2**	**6.2**
56.	QLD 92	**6.3**	6.2	6.5	6.4	6.2	6.6	**6.4**	**6.2**	6.4	6.4	**6.4**	6.2	6.6	**6.4**	**6.4**
57.	QLD 93	**6.4**	6.3	6.1	6.3	6.3	6.7	**6.3**	**6.2**	6.5	6.3	**6.4**	6.4	5.8	**6.1**	**6.3**
58.	QLD 94	**6.4**	6.5	6.6	6.5	6.1	6.4	**6.4**	**6.3**	6.3	6.4	**6.4**	6.2	6.2	**6.2**	**6.3**
59.	HUW 1522	**6.2**	6.2	6.3	5.9	5.7	6.2	**6.1**	**5.7**	6.7	6.4	**6.6**	6.6	6.0	**6.3**	**6.3**
60.	HUW 1525	**6.2**	6.4	6.1	5.8	5.9	6.3	**6.1**	**5.8**	6.3	6.3	**6.3**	6.3	6.2	**6.3**	**6.2**
61.	RAJ 4493	**6.0**	6.3	6.4	6.2	6.2	6.7	**6.4**	6.3	6.3	6.5	**6.4**	**6.2**	**6.6**	**6.4**	**6.3**
62.	RAJ 4494	**6.1**	6.5	6.2	6.1	6.0	6.2	**6.2**	6.0	6.2	5.9	**6.1**	6.0	6.4	**6.2**	**6.1**
63.	RAJ 4501	**6.2**	6.6	6.5	6.5	6.5	6.5	**6.5**	6.2	6.8	6.3	**6.6**	6.3	5.9	**6.1**	**6.3**
64.	RAJ 4496	**6.0**	6.4	6.2	6.2	6.3	6.4	**6.3**	6.3	6.4	6.4	**6.4**	6.2	6.3	**6.3**	**6.2**
65.	RAJ 4500	**5.9**	6.6	5.6	6.0	6.1	6.0	**6.1**	5.9	6.0	6.4	**6.2**	6.1	5.5	**5.8**	**6.0**
	Mean	**6.2**	**6.3**	**6.2**	**6.4**	**6.2**	**6.5**	**6.3**	**6.0**	**6.6**	**6.4**	**6.5**	**6.3**	**6.3**	**6.3**	**6.3**

Table8: Protein Content (%)ofQuality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**10.80**	12.08	14.90	13.82	9.89	12.80	**12.70**	**12.49**	13.33	12.84	**13.09**	14.53	12.04	**13.29**	**12.47**
2.	QLD-11 (I)	**14.46**	13.02	14.80	14.77	11.74	14.94	**13.85**	**12.65**	14.79	15.39	**15.09**	15.60	13.30	**14.45**	**14.46**
3.	UP-2672 (C)	**12.49**	13.46	14.04	14.07	12.10	12.91	**13.32**	**13.27**	15.49	13.74	**14.62**	15.12	14.93	**15.03**	**13.86**
4.	QLD-46	**14.20**	14.76	14.24	14.68	12.73	14.86	**14.25**	**14.37**	15.68	15.43	**15.56**	14.93	14.72	**14.83**	**14.71**
5.	QLD-49 (I)	**13.11**	12.24	14.57	14.10	11.08	12.75	**12.95**	**12.96**	15.01	15.27	**15.14**	15.92	14.40	**15.16**	**14.09**
6.	QLD-54 (I)	**14.39**	13.16	13.94	14.92	11.93	13.81	**13.55**	**13.79**	15.27	14.44	**14.86**	15.56	12.56	**14.06**	**14.21**
7.	QLD-67	**13.51**	13.24	13.85	14.58	8.59	13.52	**12.76**	**13.60**	14.82	14.68	**14.75**	15.76	14.24	**15.00**	**14.00**
8.	QBP-12-9	**10.59**	11.31	13.87	13.42	9.54	12.41	**12.11**	**12.87**	13.37	14.01	**13.69**	15.90	12.22	**14.06**	**12.61**
9.	HI-977 (C)	**11.72**	11.31	14.28	13.13	9.95	12.95	**12.32**	**13.01**	13.60	13.78	**13.69**	14.45	12.53	**13.49**	**12.81**
10.	QLD-70	**13.44**	11.04	14.35	13.64	10.13	13.14	**12.46**	**13.19**	15.06	14.28	**14.67**	14.92	13.63	**14.28**	**13.71**
11.	QLD-71	**13.78**	12.14	14.35	13.23	11.16	13.57	**12.89**	**13.88**	15.31	14.02	**14.67**	14.86	13.30	**14.08**	**13.85**
12.	QLD-73	**12.51**	11.79	13.64	14.88	9.68	13.41	**12.68**	**13.95**	14.19	14.26	**14.23**	15.24	13.94	**14.59**	**13.50**
13.	QLD-76	**11.16**	10.26	13.80	12.82	10.34	11.67	**11.78**	**13.05**	13.68	12.08	**12.88**	14.74	13.24	**13.99**	**12.45**
14.	QLD-78	**14.84**	12.09	14.95	14.42	9.79	13.74	**13.00**	**13.86**	15.34	14.08	**14.71**	15.55	14.23	**14.89**	**14.36**
15.	BWL-1660	**14.59**	14.17	14.34	14.98	12.91	14.47	**14.17**	**14.80**	15.93	15.21	**15.57**	15.99	15.84	**15.92**	**15.06**
16.	BWL-1664	**14.31**	14.34	14.49	14.15	13.13	14.73	**14.17**	**14.52**	15.68	15.99	**15.84**	15.16	15.99	**15.58**	**14.97**
17.	HD 3210	**11.60**	11.97	13.00	12.97	9.94	11.18	**11.81**	**13.12**	13.34	14.00	**13.67**	15.64	13.68	**14.66**	**12.94**
18.	UP-2672	**12.99**	11.58	12.98	13.77	10.27	11.68	**12.06**	**13.39**	15.04	15.14	**15.09**	14.45	13.41	**13.93**	**13.52**
19.	PDW-233 (C)	**11.31**	10.28	12.41	13.16	9.34	11.81	**11.40**	**12.80**	15.05	15.53	**15.29**	13.80	10.96	**12.38**	**12.60**
20.	GW 2014-596	**13.42**	13.98	14.13	14.26	12.20	13.15	**13.54**	**14.37**	15.52	15.21	**15.37**	15.34	12.35	**13.85**	**14.04**
21.	GW 2014-615	**11.58**	11.33	11.89	12.54	9.19	11.04	**11.20**	**11.25**	12.49	12.89	**12.69**	15.11	9.98	**12.55**	**12.00**
22.	HD 3215	**12.64**	11.61	13.69	13.57	9.07	10.26	**11.64**	**12.26**	13.44	13.58	**13.51**	15.24	11.77	**13.51**	**12.82**
23.	UP 2958	**13.03**	11.96	13.16	13.64	9.22	11.56	**11.91**	**13.26**	14.24	13.40	**13.82**	14.65	12.70	**13.68**	**13.11**
24.	UP 2959	**13.33**	12.40	12.39	14.34	10.43	13.97	**12.71**	**14.08**	15.17	15.22	**15.20**	13.96	12.65	**13.31**	**13.63**
25.	HI-977 (C)	**12.86**	11.37	11.61	13.51	10.70	12.41	**11.92**	**13.46**	13.50	13.52	**13.51**	13.55	10.40	**11.98**	**12.57**
26.	QLD 79	**13.25**	12.09	12.78	14.05	10.38	12.64	**12.39**	**13.81**	14.51	13.83	**14.17**	14.84	11.40	**13.12**	**13.23**
27.	QLD 80	**13.45**	11.34	13.58	14.76	9.95	11.63	**12.25**	**13.98**	14.86	13.92	**14.39**	15.70	11.73	**13.72**	**13.45**
28.	QLD 82	**12.96**	11.71	12.54	12.63	9.78	11.12	**11.56**	**13.72**	13.85	13.46	**13.66**	15.33	10.90	**13.12**	**12.82**
29.	QLD 83	**13.29**	10.69	12.49	13.24	10.71	10.96	**11.62**	**14.23**	12.45	14.08	**13.27**	14.43	11.65	**13.04**	**12.80**
30.	QLD 84	**14.40**	11.61	12.82	14.20	12.04	10.69	**12.27**	**15.61**	15.75	15.81	**15.78**	15.66	13.21	**14.44**	**14.22**
31.	QLD 85	**14.05**	11.26	11.84	14.57	10.63	13.17	**12.29**	**13.57**	12.59	15.19	**13.89**	15.37	12.91	**14.14**	**13.59**
32.	QLD 87	**13.79**	11.92	12.71	13.92	11.46	12.98	**12.60**	**14.40**	13.69	15.36	**14.53**	15.69	13.22	**14.46**	**13.84**
33.	QLD 88	**10.89**	10.00	11.79	12.32	10.55	11.30	**11.19**	**13.26**	13.10	15.02	**14.06**	15.32	13.62	**14.47**	**12.65**
34.	QLD 89	**11.69**	11.66	12.97	13.95	10.91	12.70	**12.44**	**13.08**	12.45	13.72	**13.09**	15.65	12.51	**14.08**	**12.82**
35.	UP-2672 [C]	**12.40**	13.15	13.68	14.17	12.36	13.21	**13.31**	**14.34**	14.97	13.59	**14.28**	15.73	14.72	**15.23**	**13.80**
36.	RAJ 4476	**12.77**	12.48	13.30	13.57	10.42	11.83	**12.32**	**13.06**	13.66	14.29	**13.98**	14.43	12.65	**13.54**	**13.15**
37.	JWS 733	**12.57**	12.58	11.36	13.26	9.58	10.21	**11.40**	**13.32**	13.25	13.82	**13.54**	15.40	12.97	**14.19**	**12.92**
38.	JWS 810	**12.53**	12.94	12.27	14.08	10.51	11.83	**12.33**	**14.73**	14.52	15.28	**14.90**	13.87	14.22	**14.05**	**13.45**
39.	HD 3241	**12.36**	13.19	11.54	14.13	11.71	11.37	**12.39**	**14.13**	14.91	14.48	**14.70**	15.07	13.05	**14.06**	**13.38**
40.	HD 3242	**11.07**	11.56	11.45	12.70	10.36	11.49	**11.51**	**12.77**	13.13	13.67	**13.40**	15.07	11.75	**13.41**	**12.35**
41.	PDW 233 (C)	**10.67**	9.98	12.17	12.41	9.16	11.13	**10.97**	**13.73**	13.29	15.48	**14.39**	13.03	12.46	**12.75**	**12.19**
42.	GW 2015-660	**10.86**	12.09	12.93	12.78	11.52	12.04	**12.27**	**13.73**	13.46	13.57	**13.52**	13.39	12.25	**12.82**	**12.37**
43.	GW 2015-661	**11.34**	12.23	12.96	13.35	12.26	11.64	**12.49**	**12.91**	13.99	13.79	**13.89**	14.80	12.81	**13.81**	**12.88**
44.	GW 2015-663	**12.41**	13.23	13.68	13.12	11.82	10.88	**12.55**	**13.65**	14.31	13.83	**14.07**	15.14	15.21	**15.18**	**13.55**
45.	HI-977 (C)	**12.10**	11.68	12.91	12.94	10.25	10.63	**11.68**	**13.78**	13.17	13.62	**13.40**	13.30	12.57	**12.94**	**12.53**
46.	PDW 233 (C)	**11.21**	10.83	12.96	12.43	9.91	11.08	**11.44**	**12.59**	15.01	14.50	**14.76**	13.86	12.49	**13.18**	**12.65**
47.	GW 2014-603 (D)	**13.75**	13.36	13.57	12.90	11.18	12.26	**12.65**	**14.14**	12.98	15.39	**14.19**	15.48	14.43	**14.96**	**13.89**
48.	GW 2015-691 (D)	**11.25**	11.40	13.29	12.40	8.68	11.47	**11.45**	**13.53**	12.80	15.49	**14.15**	15.97	13.73	**14.85**	**12.92**
49.	GW 2015-693 (D)	**10.92**	13.36	14.22	13.65	11.57	13.26	**13.21**	**14.70**	11.86	14.64	**13.25**	15.36	13.83	**14.60**	**12.99**
50.	GW 2015-699 (D)	**11.89**	12.97	13.01	13.37	10.19	12.83	**12.47**	**13.97**	12.73	14.36	**13.55**	15.54	15.75	**15.65**	**13.39**
51.	GW 2015-703 (D)	**10.49**	10.13	11.64	13.23	8.90	10.63	**10.91**	**12.43**	13.49	15.40	**14.45**	11.54	13.34	**12.44**	**12.07**
52.	GW 2015-705 (D)	**11.27**	11.97	12.26	13.83	9.90	11.85	**11.96**	**12.93**	14.00	14.22	**14.11**	11.94	13.72	**12.83**	**12.54**
53.	UP-2672 (C)	**13.03**	13.18	13.21	14.48	11.07	12.43	**12.87**	**14.11**	14.50	14.34	**14.42**	14.15	14.25	**14.20**	**13.63**
54.	QLD 90	**13.39**	11.43	13.61	14.34	10.48	12.50	**12.47**	**13.44**	13.71	14.32	**14.02**	14.21	12.95	**13.58**	**13.36**
55.	QLD 91	**13.78**	12.27	12.91	14.59	11.12	14.04	**12.99**	**14.02**	15.31	13.90	**14.61**	14.53	14.82	**14.68**	**14.01**
56.	QLD 92	**12.99**	11.98	12.21	14.12	9.97	12.81	**12.22**	**13.68**	14.15	13.52	**13.84**	15.87	13.77	**14.82**	**13.47**
57.	QLD 93	**11.83**	12.31	11.53	14.09	9.81	13.46	**12.24**	**13.32**	14.16	13.98	**14.07**	13.00	12.71	**12.86**	**12.75**
58.	QLD 94	**12.22**	12.52	11.59	14.42	10.25	13.42	**12.44**	**13.25**	14.56	13.74	**14.15**	14.06	12.89	**13.48**	**13.07**
59.	HUW 1522	**12.01**	11.86	11.33	13.55	10.58	12.32	**11.93**	**13.47**	13.52	13.28	**13.40**	14.08	12.60	**13.34**	**12.67**
60.	HUW 1525	**11.83**	12.00	12.28	13.83	9.58	11.27	**11.79**	**13.14**	13.66	13.79	**13.73**	14.18	12.79	**13.49**	**12.71**
61.	RAJ 4493	**13.46**	12.14	11.48	13.11	9.77	11.87	**11.67**	**12.66**	13.93	13.40	**13.67**	15.05	12.65	**13.85**	**13.16**
62.	RAJ 4494	**12.79**	11.54	12.80	13.53	10.44	12.42	**12.15**	**14.01**	14.47	14.16	**14.32**	13.84	12.68	**13.26**	**13.13**
63.	RAJ 4501	**12.26**	11.76	12.40	13.37	9.60	11.87	**11.80**	**13.16**	13.95	13.96	**13.96**	13.22	13.03	**13.13**	**12.79**
64.	RAJ 4496	**12.03**	11.87	14.11	13.20	10.70	11.28	**12.23**	**12.73**	13.37	13.13	**13.25**	13.99	13.73	**13.86**	**12.84**
65.	RAJ 4500	**11.16**	11.99	14.27	13.75	11.40	11.64	**12.61**	**14.31**	14.32	13.50	**13.91**	14.06	14.80	**14.43**	**13.03**
Mean		**12.54**	**12.08**	**13.08**	**13.69**	**10.56**	**12.32**	**12.35**	**13.53**	**14.10**	**14.26**	**14.18**	**14.72**	**13.17**	**13.95**	**13.25**

Table 9: Test Weight (kg/hl)ofQuality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**81.3**	78.5	76.0	79.7	81.0	80.0	**79.0**	**77.6**	81.0	75.8	**78.4**	78.5	79.0	**78.8**	**79.4**
2.	QLD-11 (I)	**80.4**	80.0	78.6	81.4	81.3	82.5	**80.8**	**78.0**	81.3	80.6	**81.0**	79.6	81.0	**80.3**	**80.6**
3.	UP-2672 (C)	**81.0**	77.0	75.0	76.5	79.3	78.7	**77.3**	**78.5**	80.0	82.5	**81.3**	81.3	80.5	**80.9**	**80.1**
4.	QLD-46	**78.0**	79.0	80.0	80.0	81.6	82.0	**80.5**	**77.0**	81.3	82.6	**82.0**	82.0	81.0	**81.5**	**80.5**
5.	QLD-49 (I)	**79.0**	78.5	74.0	77.0	80.5	81.4	**78.3**	**77.0**	80.0	81.6	**80.8**	80.6	78.5	**79.6**	**79.4**
6.	QLD-54 (I)	**76.0**	77.5	76.0	79.0	80.0	80.2	**78.5**	**77.5**	79.0	81.5	**80.3**	77.0	81.0	**79.0**	**78.4**
7.	QLD-67	**78.3**	78.4	75.0	79.5	79.4	81.4	**78.7**	**77.5**	80.6	79.5	**80.1**	80.0	78.0	**79.0**	**79.0**
8.	QBP-12-9	**80.2**	78.0	74.0	80.3	81.0	81.7	**79.0**	**78.6**	81.3	78.6	**80.0**	81.0	80.5	**80.8**	**80.0**
9.	HI-977 (C)	**82.0**	78.0	74.0	77.5	80.6	82.0	**78.4**	**76.5**	82.3	79.7	**81.0**	82.0	80.0	**81.0**	**80.6**
10.	QLD-70	**82.6**	80.4	78.0	80.0	82.2	83.0	**80.7**	**77.5**	80.2	80.0	**80.1**	83.0	80.5	**81.8**	**81.3**
11.	QLD-71	**81.0**	81.0	79.0	82.0	83.0	81.3	**81.3**	**79.2**	81.3	81.4	**81.4**	81.0	80.0	**80.5**	**81.0**
12.	QLD-73	**80.0**	78.7	77.5	78.0	80.0	82.4	**79.3**	**74.6**	80.0	79.6	**79.8**	78.0	78.5	**78.3**	**79.3**
13.	QLD-76	**82.5**	82.2	79.5	81.6	81.0	83.0	**81.5**	**78.0**	81.3	79.5	**80.4**	80.6	80.5	**80.6**	**81.2**
14.	QLD-78	**80.4**	79.4	78.6	80.5	81.6	82.2	**80.5**	**77.0**	82.0	81.6	**81.8**	82.0	80.5	**81.3**	**81.0**
15.	BWL-1660	**78.0**	80.0	79.0	80.0	82.0	80.3	**80.3**	**79.0**	81.0	81.5	**81.3**	80.0	80.0	**80.0**	**79.9**
16.	BWL-1664	**78.6**	78.6	79.5	79.5	81.3	82.5	**80.3**	**79.0**	80.4	81.8	**81.1**	79.0	81.0	**80.0**	**80.0**
17.	HD 3210	**80.6**	79.7	70.0	75.2	79.3	82.3	**77.3**	**78.0**	83.0	82.2	**82.6**	80.3	80.0	**80.2**	**80.2**
18.	UP-2672	**79.5**	79.7	76.0	79.2	82.2	80.0	**79.4**	**79.0**	81.8	80.4	**81.1**	80.0	80.5	**80.3**	**80.1**
19.	PDW-233 (C)	**80.0**	81.0	80.7	78.5	81.0	78.6	**80.0**	**78.0**	80.0	74.7	**77.4**	82.2	81.5	**81.9**	**79.8**
20.	GW 2014-596	**79.3**	78.3	71.6	79.4	77.0	80.0	**77.3**	**77.5**	81.0	81.3	**81.2**	78.3	80.0	**79.2**	**79.2**
21.	GW 2014-615	**81.0**	78.4	70.5	72.0	81.0	82.5	**76.9**	**81.0**	83.7	82.5	**83.1**	83.0	81.5	**82.3**	**80.8**
22.	HD 3215	**80.2**	79.2	72.5	76.5	81.2	82.3	**78.3**	**78.6**	81.3	78.7	**80.0**	78.0	80.5	**79.3**	**79.4**
23.	UP 2958	**81.0**	78.5	76.6	78.6	80.6	82.0	**79.3**	**78.0**	82.5	81.0	**81.8**	81.0	79.0	**80.0**	**80.5**
24.	UP 2959	**80.0**	74.2	77.8	76.0	80.3	76.8	**77.0**	**76.0**	79.5	73.5	**76.5**	80.0	80.0	**80.0**	**78.4**
25.	HI-977 (C)	**80.5**	77.3	77.0	76.0	81.4	79.0	**78.1**	**77.3**	83.0	79.0	**81.0**	82.7	80.5	**81.6**	**80.3**
26.	QLD 79	**77.0**	75.7	75.0	75.4	78.0	80.6	**76.9**	**74.5**	79.2	77.0	**78.1**	79.0	78.5	**78.8**	**77.7**
27.	QLD 80	**78.0**	75.2	76.6	75.2	75.6	78.6	**76.2**	**72.0**	78.3	76.5	**77.4**	77.5	75.0	**76.3**	**77.0**
28.	QLD 82	**80.0**	77.2	78.5	80.0	80.6	81.5	**79.6**	**76.5**	82.5	79.0	**80.8**	80.5	80.0	**80.3**	**80.1**
29.	QLD 83	**77.0**	76.5	77.6	77.0	80.0	79.8	**78.2**	**74.2**	81.3	79.0	**80.2**	79.0	79.5	**79.3**	**78.6**
30.	QLD 84	**75.6**	77.0	73.5	73.0	74.5	79.4	**75.5**	**74.5**	78.4	72.5	**75.5**	77.3	78.0	**77.7**	**76.0**
31.	QLD 85	**79.0**	78.8	79.5	78.2	80.0	79.0	**79.1**	**76.0**	81.3	75.5	**78.4**	79.3	79.5	**79.4**	**79.0**
32.	QLD 87	**78.0**	78.5	78.3	78.6	79.5	82.5	**79.5**	**76.3**	80.0	75.0	**77.5**	77.0	78.5	**77.8**	**78.2**
33.	QLD 88	**79.0**	80.0	77.5	78.2	84.4	80.6	**80.1**	**77.5**	81.3	76.7	**79.0**	78.0	78.0	**78.0**	**79.0**
34.	QLD 89	**80.2**	78.6	78.5	79.5	81.0	82.0	**79.9**	**77.6**	81.8	79.0	**80.4**	79.5	80.5	**80.0**	**80.1**
35.	UP-2672 [C]	**79.0**	81.0	76.8	74.6	78.5	79.5	**78.1**	**77.6**	83.4	79.0	**81.2**	81.3	79.5	**80.4**	**79.7**
36.	RAJ 4476	**81.0**	76.3	75.0	77.4	82.2	81.0	**78.4**	**78.0**	83.7	83.0	**83.4**	83.7	80.0	**81.9**	**81.1**
37.	JWS 733	**83.0**	77.8	79.0	80.7	83.3	83.0	**80.8**	**80.0**	82.0	81.8	**81.9**	83.4	81.0	**82.2**	**82.0**
38.	JWS 810	**82.5**	80.0	81.0	79.4	81.0	81.8	**80.6**	**76.5**	80.6	77.5	**79.1**	82.5	78.5	**80.5**	**80.7**
39.	HD 3241	**79..5**	81.5	79.7	77.8	80.5	82.8	**80.5**	**76.0**	82.5	76.5	**79.5**	80.5	79.5	**80.0**	**80.0**
40.	HD 3242	**80.3**	79.0	80.0	79.6	83.0	83.7	**81.1**	**78.2**	80.5	81.8	**81.2**	81.3	80.0	**80.7**	**80.8**
41.	PDW 233 (C)	**80.5**	78.4	80.0	79.2	82.5	82.0	**80.4**	**76.0**	83.0	75.6	**79.3**	83.5	82.0	**82.8**	**80.7**
42.	GW 2015-660	**82.7**	79.7	72.5	75.2	80.0	78.3	**77.1**	**76.5**	83.0	82.5	**82.8**	83.4	81.5	**82.5**	**81.3**
43.	GW 2015-661	**80.0**	78.0	80.8	71.0	79.0	74.6	**76.7**	**76.0**	83.5	83.0	**83.3**	82.0	80.0	**81.0**	**80.2**
44.	GW 2015-663	**80.0**	79.5	79.0	81.3	81.7	84.0	**81.1**	**80.2**	82.8	83.0	**82.9**	82.0	75.0	**78.5**	**80.6**
45.	HI-977 (C)	**81.2**	81.0	76.5	77.5	81.4	82.3	**79.7**	**76.0**	79.5	82.5	**81.0**	82.6	79.5	**81.1**	**80.7**
46.	PDW 233 (C)	**80.0**	80.6	79.5	80.5	83.0	81.0	**80.9**	**77.0**	83.0	78.7	**80.9**	83.0	81.0	**82.0**	**80.9**
47.	GW 2014-603 (D)	**79.5**	77.0	80.5	83.3	81.4	83.6	**81.2**	**80.5**	78.0	82.4	**80.2**	82.0	81.5	**81.8**	**80.7**
48.	GW 2015-691 (D)	**80.6**	80.6	79.0	82.7	82.5	83.5	**81.7**	**79.0**	83.8	82.5	**83.2**	83.3	82.0	**82.7**	**82.0**
49.	GW 2015-693 (D)	**76.3**	77.0	75.0	75.0	76.0	79.0	**76.4**	**74.5**	83.0	79.0	**81.0**	78.0	77.0	**77.5**	**77.8**
50.	GW 2015-699 (D)	**81.6**	79.4	82.5	82.3	83.5	84.0	**82.3**	**80.0**	81.6	83.7	**82.7**	83.5	80.0	**81.8**	**82.1**
51.	GW 2015-703 (D)	**80.2**	80.5	81.7	81.6	82.2	83.3	**81.9**	**80.6**	82.7	80.5	**81.6**	83.7	80.5	**82.1**	**81.4**
52.	GW 2015-705 (D)	**80.0**	80.3	82.0	81.7	82.7	83.0	**81.9**	**78.0**	82.0	81.0	**81.5**	82.2	79.5	**80.9**	**81.1**
53.	UP-2672 (C)	**81.0**	76.8	78.6	74.5	79.3	80.0	**77.8**	**79.0**	79.5	80.6	**80.1**	82.0	80.0	**81.0**	**80.0**
54.	QLD 90	**80.2**	78.5	80.0	81.3	82.0	83.0	**81.0**	**75.8**	82.4	79.0	**80.7**	80.6	81.0	**80.8**	**80.7**
55.	QLD 91	**79.2**	77.6	80.5	78.0	80.8	82.0	**79.8**	**75.7**	80.6	80.2	**80.4**	80.0	79.0	**79.5**	**79.7**
56.	QLD 92	**80.0**	78.3	78.5	76.5	78.5	81.3	**78.6**	**77.0**	80.0	80.6	**80.3**	80.0	81.0	**80.5**	**79.9**
57.	QLD 93	**80.6**	80.3	79.5	78.2	81.7	81.0	**80.1**	**77.0**	80.6	78.7	**79.7**	80.5	78.0	**79.3**	**79.9**
58.	QLD 94	**80.5**	79.3	79.6	80.0	81.0	81.5	**80.3**	**76.7**	80.0	79.7	**79.9**	80.4	78.5	**79.5**	**80.0**
59.	HUW 1522	**79.0**	79.7	75.3	72.5	74.5	76.8	**75.8**	**72.0**	80.6	80.0	**80.3**	81.5	76.5	**79.0**	**78.5**
60.	HUW 1525	**78.0**	78.7	79.0	75.0	78.3	79.5	**78.1**	**72.6**	81.6	80.0	**80.8**	82.0	79.5	**80.8**	**79.4**
61.	RAJ 4493	**79.2**	79.4	80.0	81.8	80.5	83.2	**81.0**	**79.0**	83.3	83.0	**83.2**	82.6	80.5	**81.6**	**81.2**
62.	RAJ 4494	**81.0**	81.3	81.6	81.6	81.5	82.5	**81.7**	**76.0**	83.0	80.5	**81.8**	82.2	81.0	**81.6**	**81.5**
63.	RAJ 4501	**81.0**	79.5	77.0	79.0	81.0	81.2	**79.5**	**76.0**	81.5	78.3	**79.9**	81.2	80.0	**80.6**	**80.3**
64.	RAJ 4496	**80.3**	78.5	72.6	78.6	80.6	82.5	**78.6**	**79.2**	82.0	81.6	**81.8**	82.0	80.5	**81.3**	**80.5**
65.	RAJ 4500	**78.0**	75.7	72.7	76.0	77.5	77.2	**75.8**	**74.5**	77.5	76.3	**76.9**	76.7	73.5	**75.1**	**76.5**
Mean		**79.9**	**78.8**	**77.5**	**78.4**	**80.5**	**81.1**	**79.3**	**77.2**	**81.3**	**79.8**	**80.5**	**80.8**	**79.7**	**80.2**	**80.0**

Table10: Sedimentation Value of Quality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**62**	61	62	60	62	61	**61**	**61**	62	60	**61**	60	61	**61**	**61**
2.	QLD-11 (I)	**41**	43	46	40	49	41	**44**	**49**	40	42	**41**	37	45	**41**	**42**
3.	UP-2672 (C)	**60**	56	58	59	60	55	**58**	**56**	60	57	**59**	53	60	**57**	**58**
4.	QLD-46	**61**	50	54	49	56	52	**52**	**53**	57	51	**54**	57	58	**58**	**56**
5.	QLD-49 (I)	**52**	50	51	59	54	52	**53**	**52**	56	55	**56**	49	58	**54**	**54**
6.	QLD-54 (I)	**38**	40	40	43	41	41	**41**	**45**	50	48	**49**	39	43	**41**	**42**
7.	QLD-67	**46**	40	45	47	48	45	**45**	**50**	46	43	**45**	45	51	**48**	**46**
8.	QBP-12-9	**39**	39	43	40	36	38	**39**	**43**	46	40	**43**	43	44	**44**	**41**
9.	HI-977 (C)	**61**	64	67	64	60	61	**63**	**60**	65	61	**63**	63	62	**63**	**62**
10.	QLD-70	**60**	55	56	61	59	66	**59**	**58**	60	63	**62**	52	59	**56**	**59**
11.	QLD-71	**57**	59	51	58	57	64	**58**	**54**	58	56	**57**	53	58	**56**	**57**
12.	QLD-73	**42**	40	41	48	40	45	**43**	**47**	45	46	**46**	50	48	**49**	**45**
13.	QLD-76	**63**	59	66	58	66	62	**62**	**62**	60	63	**62**	60	63	**62**	**62**
14.	QLD-78	**62**	66	61	62	59	60	**62**	**65**	58	61	**60**	58	60	**59**	**61**
15.	BWL-1660	**61**	56	52	58	54	62	**56**	**57**	60	63	**62**	56	58	**57**	**59**
16.	BWL-1664	**62**	61	55	60	61	56	**59**	**58**	60	62	**61**	58	60	**59**	**60**
17.	HD 3210	**61**	61	61	64	62	59	**61**	**61**	58	54	**56**	62	60	**61**	**60**
18.	UP-2672	**62**	62	56	62	55	63	**60**	**60**	63	61	**62**	63	60	**62**	**61**
19.	PDW-233 (C)	**45**	43	46	50	48	52	**48**	**35**	43	40	**42**	40	38	**39**	**43**
20.	GW 2014-596	**52**	45	48	51	45	53	**48**	**48**	45	47	**46**	42	46	**44**	**48**
21.	GW 2014-615	**61**	55	49	60	58	58	**56**	**61**	54	58	**56**	56	60	**58**	**58**
22.	HD 3215	**62**	59	65	62	61	63	**62**	**60**	57	65	**61**	62	58	**60**	**61**
23.	UP 2958	**63**	58	58	61	62	60	**60**	**55**	63	60	**62**	58	60	**59**	**61**
24.	UP 2959	**56**	54	55	57	60	60	**57**	**55**	57	63	**60**	56	59	**58**	**58**
25.	HI-977 (C)	**57**	62	57	63	61	62	**61**	**61**	64	61	**63**	61	62	**62**	**61**
26.	QLD 79	**42**	46	43	53	52	48	**48**	**50**	46	42	**44**	48	50	**49**	**46**
27.	QLD 80	**59**	54	60	55	55	61	**57**	**62**	59	52	**56**	60	62	**61**	**58**
28.	QLD 82	**54**	46	53	52	48	54	**51**	**48**	60	54	**57**	48	53	**51**	**53**
29.	QLD 83	**42**	42	46	45	48	50	**46**	**51**	50	43	**47**	44	46	**45**	**45**
30.	QLD 84	**61**	51	56	59	58	60	**57**	**58**	64	53	**59**	57	54	**56**	**58**
31.	QLD 85	**52**	57	49	57	58	60	**56**	**55**	60	48	**54**	54	59	**57**	**55**
32.	QLD 87	**38**	43	43	44	48	47	**45**	**43**	45	46	**46**	41	43	**42**	**43**
33.	QLD 88	**36**	43	46	51	47	50	**47**	**46**	51	46	**49**	50	48	**49**	**45**
34.	QLD 89	**61**	63	54	61	60	58	**59**	**58**	60	52	**56**	57	61	**59**	**59**
35.	UP-2672 [C]	**62**	59	50	60	58	55	**56**	**56**	62	59	**61**	58	60	**59**	**59**
36.	RAJ 4476	**58**	52	51	55	55	53	**53**	**54**	49	45	**47**	53	51	**52**	**53**
37.	JWS 733	**53**	45	43	52	44	45	**46**	**49**	55	50	**53**	50	46	**48**	**50**
38.	JWS 810	**53**	48	45	53	54	48	**50**	**47**	54	51	**53**	59	58	**59**	**53**
39.	HD 3241	**62**	60	63	63	59	58	**61**	**63**	60	56	**58**	62	59	**61**	**60**
40.	HD 3242	**63**	59	56	60	61	57	**59**	**61**	55	59	**57**	57	59	**58**	**59**
41.	PDW 233 (C)	**42**	40	35	36	37	40	**38**	**41**	39	40	**40**	41	37	**39**	**40**
42.	GW 2015-660	**58**	47	41	47	52	50	**47**	**51**	57	50	**54**	54	50	**52**	**53**
43.	GW 2015-661	**63**	60	53	60	57	56	**57**	**63**	57	52	**55**	60	56	**58**	**58**
44.	GW 2015-663	**62**	58	50	59	63	60	**58**	**52**	57	52	**55**	55	60	**58**	**58**
45.	HI-977 (C)	**62**	62	60	64	62	62	**62**	**60**	64	64	**64**	62	63	**63**	**63**
46.	PDW 233 (C)	**43**	46	39	40	41	36	**40**	**36**	41	40	**41**	42	37	**40**	**41**
47.	GW 2014-603 (D)	**42**	35	39	42	43	36	**39**	**41**	38	39	**39**	34	40	**37**	**39**
48.	GW 2015-691 (D)	**41**	42	35	41	43	38	**40**	**40**	38	41	**40**	35	40	**38**	**39**
49.	GW 2015-693 (D)	**42**	42	37	35	41	35	**38**	**45**	37	36	**37**	37	40	**39**	**39**
50.	GW 2015-699 (D)	**41**	36	38	37	40	36	**37**	**38**	41	34	**38**	33	37	**35**	**38**
51.	GW 2015-703 (D)	**28**	32	27	28	30	31	**30**	**37**	36	31	**34**	25	30	**28**	**30**
52.	GW 2015-705 (D)	**26**	27	27	25	25	28	**26**	**32**	33	28	**31**	27	30	**29**	**28**
53.	UP-2672 (C)	**61**	53	52	58	60	61	**57**	**60**	55	58	**57**	58	61	**60**	**58**
54.	QLD 90	**62**	59	53	51	53	58	**55**	**53**	54	54	**54**	57	61	**59**	**57**
55.	QLD 91	**59**	60	55	54	56	59	**57**	**60**	54	61	**58**	58	61	**60**	**58**
56.	QLD 92	**53**	53	48	51	52	48	**50**	**48**	53	51	**52**	56	49	**53**	**52**
57.	QLD 93	**63**	60	55	61	53	55	**57**	**59**	62	59	**61**	60	56	**58**	**60**
58.	QLD 94	**62**	58	57	60	57	57	**58**	**60**	61	59	**60**	62	56	**59**	**60**
59.	HUW 1522	**63**	52	45	55	49	53	**51**	**54**	49	55	**52**	50	56	**53**	**55**
60.	HUW 1525	**64**	53	44	51	50	46	**49**	**49**	54	46	**50**	49	53	**51**	**53**
61.	RAJ 4493	**50**	44	44	50	49	48	**47**	**46**	52	41	**47**	48	41	**45**	**47**
62.	RAJ 4494	**52**	43	45	48	44	50	**46**	**53**	48	46	**47**	49	43	**46**	**48**
63.	RAJ 4501	**44**	37	35	42	40	42	**39**	**43**	40	39	**40**	38	43	**41**	**41**
64.	RAJ 4496	**61**	45	46	55	47	54	**49**	**49**	52	40	**46**	48	50	**49**	**51**
65.	RAJ 4500	**48**	42	43	46	44	46	**44**	**45**	47	43	**45**	46	45	**46**	**46**
Mean		**53**	**51**	**49**	**52**	**52**	**52**	**51**	**52**	**53**	**51**	**52**	**51**	**52**	**52**	**52**

Table 11: Grain Hardness Index of Quality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**85**	67	74	80	75	84	**76**	**73**	79	84	**82**	86	81	**83**	**80**
2.	QLD-11 (I)	**67**	65	70	71	79	76	**72**	**71**	68	74	**71**	75	69	**72**	**70**
3.	UP-2672 (C)	**78**	60	79	75	75	81	**74**	**73**	71	74	**72**	72	73	**73**	**74**
4.	QLD-46	**53**	43	58	62	60	57	**56**	**51**	60	63	**61**	63	56	**60**	**56**
5.	QLD-49 (I)	**19**	12	13	21	26	23	**19**	**12**	22	20	**21**	32	30	**31**	**21**
6.	QLD-54 (I)	**31**	26	29	31	39	33	**31**	**23**	25	35	**30**	33	34	**34**	**30**
7.	QLD-67	**27**	27	27	30	30	32	**29**	**18**	23	32	**28**	34	22	**28**	**26**
8.	QBP-12-9	**38**	24	39	35	39	34	**34**	**21**	28	41	**34**	34	32	**33**	**32**
9.	HI-977 (C)	**85**	66	81	79	75	79	**76**	**72**	76	83	**79**	76	72	**74**	**77**
10.	QLD-70	**71**	56	74	79	78	79	**73**	**61**	71	82	**77**	78	76	**77**	**72**
11.	QLD-71	**70**	60	75	77	73	73	**72**	**67**	73	75	**74**	79	83	**81**	**73**
12.	QLD-73	**24**	11	22	23	25	25	**21**	**21**	21	26	**24**	25	22	**24**	**23**
13.	QLD-76	**83**	63	77	86	76	83	**77**	**75**	77	84	**80**	86	76	**81**	**79**
14.	QLD-78	**56**	52	67	74	66	62	**64**	**59**	70	68	**69**	70	72	**71**	**64**
15.	BWL-1660	**57**	55	67	69	77	67	**67**	**66**	62	68	**65**	60	71	**66**	**64**
16.	BWL-1664	**61**	56	60	71	78	69	**67**	**62**	64	70	**67**	72	69	**71**	**66**
17.	HD 3210	**72**	63	75	86	81	71	**75**	**71**	66	79	**73**	76	78	**77**	**74**
18.	UP-2672	**72**	64	77	85	81	81	**78**	**75**	73	88	**81**	82	87	**84**	**78**
19.	PDW-233 (C)	**88**	76	85	91	94	95	**88**	**101**	88	94	**91**	84	93	**88**	**91**
20.	GW 2014-596	**71**	65	75	74	74	73	**72**	**70**	66	69	**68**	62	75	**68**	**70**
21.	GW 2014-615	**76**	76	83	90	73	93	**83**	**75**	78	87	**83**	69	86	**78**	**79**
22.	HD 3215	**69**	61	80	84	83	86	**79**	**76**	78	90	**84**	84	81	**83**	**78**
23.	UP 2958	**76**	61	72	85	78	75	**74**	**73**	75	85	**80**	81	83	**82**	**77**
24.	UP 2959	**82**	78	72	89	88	90	**83**	**81**	85	91	**88**	86	86	**86**	**84**
25.	HI-977 (C)	**75**	73	76	77	81	78	**77**	**72**	68	79	**74**	78	80	**79**	**75**
26.	QLD 79	**83**	69	64	77	81	88	**76**	**75**	74	87	**80**	74	81	**78**	**78**
27.	QLD 80	**30**	16	33	29	36	36	**30**	**25**	26	40	**33**	32	35	**34**	**30**
28.	QLD 82	**36**	20	30	27	30	33	**28**	**22**	33	32	**32**	32	26	**29**	**29**
29.	QLD 83	**53**	36	45	45	47	44	**44**	**25**	42	49	**45**	41	35	**38**	**41**
30.	QLD 84	**16**	13	17	19	22	22	**19**	**23**	16	19	**18**	19	11	**15**	**18**
31.	QLD 85	**79**	77	71	79	86	85	**80**	**71**	79	78	**79**	75	80	**78**	**77**
32.	QLD 87	**76**	59	71	74	74	77	**71**	**71**	67	82	**74**	78	76	**77**	**74**
33.	QLD 88	**76**	65	78	82	84	86	**79**	**76**	84	90	**87**	80	83	**82**	**80**
34.	QLD 89	**81**	67	75	85	84	87	**79**	**86**	83	89	**86**	89	86	**87**	**84**
35.	UP-2672 [C]	**77**	60	74	82	84	73	**74**	**70**	72	84	**78**	77	76	**77**	**75**
36.	RAJ 4476	**76**	64	66	86	87	88	**78**	**79**	73	81	**77**	78	80	**79**	**78**
37.	JWS 733	**74**	64	71	85	87	88	**79**	**78**	87	87	**87**	76	80	**78**	**79**
38.	JWS 810	**72**	66	70	82	79	80	**76**	**73**	76	84	**80**	73	85	**79**	**76**
39.	HD 3241	**58**	51	62	73	71	73	**66**	**61**	74	83	**79**	73	67	**70**	**67**
40.	HD 3242	**68**	55	65	79	75	72	**69**	**71**	79	82	**80**	81	78	**80**	**74**
41.	PDW 233 (C)	**87**	78	78	91	88	90	**85**	**102**	102	92	**97**	86	95	**91**	**92**
42.	GW 2015-660	**79**	74	66	80	78	84	**76**	**80**	86	82	**84**	78	85	**82**	**80**
43.	GW 2015-661	**70**	59	71	86	86	93	**79**	**76**	86	75	**80**	68	78	**73**	**75**
44.	GW 2015-663	**75**	61	74	81	86	81	**77**	**80**	79	76	**77**	74	78	**76**	**77**
45.	HI-977 (C)	**80**	62	77	84	79	78	**76**	**77**	81	79	**80**	74	66	**70**	**77**
46.	PDW 233 (C)	**89**	81	85	89	88	97	**88**	**101**	89	87	**88**	87	92	**89**	**91**
47.	GW 2014-603 (D)	**80**	70	80	83	81	81	**79**	**89**	74	77	**75**	72	84	**78**	**80**
48.	GW 2015-691 (D)	**72**	70	86	83	88	93	**84**	**89**	85	84	**84**	78	86	**82**	**82**
49.	GW 2015-693 (D)	**86**	74	83	82	89	76	**81**	**99**	97	83	**90**	85	87	**86**	**88**
50.	GW 2015-699 (D)	**91**	73	75	87	88	87	**82**	**100**	94	83	**89**	83	88	**86**	**89**
51.	GW 2015-703 (D)	**87**	80	80	92	82	92	**85**	**100**	100	92	**96**	83	95	**89**	**91**
52.	GW 2015-705 (D)	**93**	82	80	89	91	96	**88**	**86**	101	87	**94**	83	81	**82**	**88**
53.	UP-2672 (C)	**75**	42	68	86	70	85	**70**	**77**	76	81	**79**	71	73	**72**	**74**
54.	QLD 90	**75**	62	70	75	73	76	**71**	**62**	82	78	**80**	76	82	**79**	**74**
55.	QLD 91	**57**	55	60	81	75	70	**68**	**59**	76	79	**77**	78	75	**76**	**68**
56.	QLD 92	**77**	66	74	84	84	87	**79**	**69**	83	86	**84**	86	94	**90**	**80**
57.	QLD 93	**67**	58	65	80	78	79	**72**	**68**	76	80	**78**	79	68	**74**	**72**
58.	QLD 94	**69**	61	64	76	77	75	**70**	**71**	77	80	**79**	75	65	**70**	**72**
59.	HUW 1522	**80**	73	65	83	90	84	**79**	**76**	84	79	**81**	79	83	**81**	**79**
60.	HUW 1525	**76**	64	72	77	85	81	**76**	**70**	91	79	**85**	82	80	**81**	**77**
61.	RAJ 4493	**71**	66	74	82	92	80	**79**	**74**	85	80	**82**	78	80	**79**	**77**
62.	RAJ 4494	**43**	30	37	36	44	37	**37**	**33**	36	39	**38**	47	35	**41**	**38**
63.	RAJ 4501	**78**	66	76	81	82	82	**77**	**75**	79	84	**81**	79	68	**74**	**77**
64.	RAJ 4496	**77**	66	70	87	89	80	**78**	**76**	91	86	**89**	77	70	**74**	**79**
65.	RAJ 4500	**65**	58	63	75	73	75	**69**	**60**	70	75	**73**	71	71	**71**	**67**
Mean		**68**	**58**	**66**	**73**	**73**	**73**	**69**	**67**	**71**	**74**	**72**	**70**	**71**	**71**	**70**

Table 12: Moisture Content (%)ofQuality Component Screening Nursery Entries

Sr. No.	QCSN Entries	NHZ	NWPZ						NEPZ	CZ			PZ			Overall Mean
		Almora	Ludhiana	Durgapura	Delhi	Pantnagar	Karnal	Mean	Pusa	Junagarh	Vijapur	Mean	Pune	Dharwad	Mean	
1.	BW-5872 (I)	**11.84**	9.11	9.11	8.70	10.57	9.68	**9.43**	**11.98**	8.38	9.40	**9.92**	9.33	9.44	**9.39**	**10.51**
2.	QLD-11 (I)	**11.32**	8.53	10.07	8.13	10.23	9.51	**9.29**	**12.09**	8.34	8.77	**9.73**	8.52	9.31	**8.92**	**10.27**
3.	UP-2672 (C)	**11.55**	9.26	8.40	8.36	10.41	9.55	**9.20**	**11.79**	8.62	9.81	**10.07**	8.87	9.79	**9.33**	**10.39**
4.	QLD-46	**11.40**	8.85	8.99	8.98	10.38	9.43	**9.33**	**11.91**	8.47	8.98	**9.79**	8.58	9.87	**9.23**	**10.33**
5.	QLD-49 (I)	**11.46**	8.71	8.46	8.39	10.10	8.79	**8.89**	**11.89**	7.28	8.37	**9.18**	8.32	8.99	**8.66**	**10.02**
6.	QLD-54 (I)	**11.49**	9.14	8.29	8.09	10.35	9.47	**9.07**	**11.43**	8.12	8.78	**9.44**	8.31	9.73	**9.02**	**10.09**
7.	QLD-67	**11.39**	9.09	9.73	8.87	9.82	9.48	**9.40**	**11.82**	7.57	8.87	**9.42**	8.15	9.66	**8.91**	**10.19**
8.	QBP-12-9	**11.56**	9.46	8.88	8.79	10.46	9.43	**9.40**	**11.78**	7.67	8.17	**9.21**	8.13	9.14	**8.64**	**10.12**
9.	HI-977 (C)	**11.65**	8.89	9.93	8.74	10.76	9.35	**9.53**	**11.73**	8.52	9.37	**9.87**	8.70	10.34	**9.52**	**10.46**
10.	QLD-70	**11.46**	8.88	8.88	8.43	10.33	9.34	**9.17**	**11.97**	8.40	9.43	**9.93**	8.61	9.68	**9.15**	**10.34**
11.	QLD-71	**11.27**	8.89	8.78	8.53	10.41	9.65	**9.25**	**11.73**	8.53	9.47	**9.91**	8.56	9.52	**9.04**	**10.24**
12.	QLD-73	**11.32**	9.18	8.68	7.89	10.31	8.98	**9.01**	**11.75**	7.69	8.70	**9.38**	8.15	9.44	**8.80**	**10.05**
13.	QLD-76	**11.58**	8.84	8.16	8.57	10.50	9.87	**9.19**	**11.96**	8.70	8.43	**9.70**	8.33	9.44	**8.89**	**10.26**
14.	QLD-78	**11.13**	8.96	8.06	8.47	10.38	9.55	**9.08**	**11.26**	8.13	8.88	**9.42**	8.38	9.61	**9.00**	**9.98**
15.	BWL-1660	**11.32**	9.24	8.62	8.57	10.68	9.92	**9.41**	**11.97**	9.18	9.61	**10.25**	8.79	9.91	**9.35**	**10.46**
16.	BWL-1664	**11.40**	9.31	8.53	9.00	10.81	9.63	**9.46**	**11.54**	9.14	9.57	**10.08**	9.09	10.05	**9.57**	**10.41**
17.	HD 3210	**11.67**	9.39	8.80	8.76	10.61	9.60	**9.43**	**12.23**	9.10	9.53	**10.29**	9.03	9.46	**9.25**	**10.57**
18.	UP-2672	**11.39**	8.96	9.16	8.49	10.58	9.91	**9.42**	**11.81**	8.56	9.18	**9.85**	8.78	9.52	**9.15**	**10.32**
19.	PDW-233 (C)	**11.56**	9.19	8.94	8.85	10.90	9.74	**9.52**	**11.57**	8.79	9.19	**9.85**	8.87	9.57	**9.22**	**10.34**
20.	GW 2014-596	**11.62**	9.23	8.82	8.78	10.74	9.84	**9.48**	**11.60**	8.41	9.30	**9.77**	8.84	9.86	**9.35**	**10.36**
21.	GW 2014-615	**11.38**	9.14	8.86	8.77	10.58	9.57	**9.38**	**11.52**	8.81	9.40	**9.91**	8.92	9.65	**9.29**	**10.30**
22.	HD 3215	**11.54**	9.39	9.35	8.68	10.67	9.73	**9.56**	**11.92**	8.66	9.24	**9.94**	8.55	9.50	**9.03**	**10.40**
23.	UP 2958	**11.64**	9.68	8.86	8.87	10.61	10.26	**9.66**	**11.76**	8.96	9.23	**9.98**	8.70	9.47	**9.09**	**10.42**
24.	UP 2959	**11.60**	9.52	9.28	8.99	10.53	9.32	**9.53**	**11.63**	8.57	9.46	**9.89**	8.88	9.84	**9.36**	**10.40**
25.	HI-977 (C)	**11.54**	9.23	8.88	8.22	10.86	9.69	**9.38**	**11.86**	8.57	9.51	**9.98**	8.86	9.87	**9.37**	**10.42**
26.	QLD 79	**11.67**	9.40	9.51	8.92	10.66	10.05	**9.71**	**12.12**	8.93	9.50	**10.18**	8.65	9.86	**9.26**	**10.59**
27.	QLD 80	**11.36**	9.12	7.35	8.01	10.16	9.13	**8.75**	**11.77**	8.18	8.62	**9.52**	8.35	9.52	**8.94**	**10.07**
28.	QLD 82	**11.31**	8.77	8.71	8.97	10.70	9.00	**9.23**	**11.61**	8.07	8.78	**9.49**	8.17	8.86	**8.52**	**10.03**
29.	QLD 83	**11.41**	8.97	8.30	8.30	11.00	9.22	**9.16**	**11.50**	8.22	8.89	**9.54**	8.10	9.18	**8.64**	**10.05**
30.	QLD 84	**11.20**	8.88	8.79	8.61	10.31	9.08	**9.13**	**11.59**	7.80	8.81	**9.40**	8.16	9.10	**8.63**	**9.99**
31.	QLD 85	**11.52**	9.20	9.57	8.67	10.51	9.55	**9.50**	**11.59**	8.54	9.17	**9.77**	8.15	9.44	**8.80**	**10.23**
32.	QLD 87	**11.52**	9.45	8.35	8.59	10.62	9.76	**9.35**	**11.63**	8.86	9.41	**9.97**	8.35	9.50	**8.93**	**10.28**
33.	QLD 88	**11.73**	8.88	9.13	8.63	10.61	9.49	**9.35**	**11.93**	8.90	8.92	**9.92**	8.54	9.44	**8.99**	**10.38**
34.	QLD 89	**11.63**	8.91	9.26	8.10	10.61	9.73	**9.32**	**11.97**	8.84	9.39	**10.07**	8.33	9.41	**8.87**	**10.37**
35.	UP-2672 [C]	**11.68**	9.17	8.83	8.81	10.80	9.71	**9.46**	**11.96**	9.01	9.07	**10.01**	8.90	9.64	**9.27**	**10.48**
36.	RAJ 4476	**11.73**	8.96	10.07	8.49	10.73	9.47	**9.54**	**12.15**	9.17	9.02	**10.11**	8.72	9.92	**9.32**	**10.57**
37.	JWS 733	**11.63**	9.04	8.59	8.35	10.78	9.69	**9.29**	**12.02**	9.26	9.36	**10.21**	8.47	9.48	**8.98**	**10.43**
38.	JWS 810	**11.69**	8.95	9.32	8.65	10.14	9.93	**9.40**	**11.66**	8.93	9.11	**9.90**	8.61	10.19	**9.40**	**10.41**
39.	HD 3241	**11.62**	9.15	8.87	8.08	10.23	9.21	**9.11**	**11.84**	8.19	9.20	**9.74**	8.47	9.31	**8.89**	**10.24**
40.	HD 3242	**11.67**	9.09	9.60	8.43	10.41	9.75	**9.46**	**11.88**	8.70	9.59	**10.06**	8.31	9.38	**8.85**	**10.38**
41.	PDW 233 (C)	**11.70**	9.05	10.27	8.77	10.79	10.09	**9.79**	**11.67**	8.99	9.04	**9.90**	8.59	9.41	**9.00**	**10.41**
42.	GW 2015-660	**11.70**	9.57	9.36	8.61	10.48	9.70	**9.54**	**11.60**	8.78	9.24	**9.87**	8.64	9.20	**8.92**	**10.33**
43.	GW 2015-661	**11.75**	9.19	8.87	8.47	10.66	9.60	**9.36**	**11.83**	9.08	9.49	**10.13**	8.98	9.88	**9.43**	**10.50**
44.	GW 2015-663	**11.69**	9.48	8.44	8.56	10.51	9.93	**9.38**	**11.75**	9.21	9.61	**10.19**	8.44	9.57	**9.01**	**10.40**
45.	HI-977 (C)	**11.59**	9.28	9.86	8.58	10.44	9.93	**9.62**	**11.82**	8.97	9.28	**10.02**	8.66	9.41	**9.04**	**10.42**
46.	PDW 233 (C)	**11.72**	9.02	9.15	8.66	10.82	10.04	**9.54**	**11.98**	9.06	9.48	**10.17**	8.53	9.38	**8.96**	**10.47**
47.	GW 2014-603 (D)	**11.52**	9.58	9.96	8.88	10.53	10.00	**9.79**	**12.24**	9.39	8.74	**10.12**	8.82	9.15	**8.99**	**10.53**
48.	GW 2015-691 (D)	**11.59**	9.00	8.84	8.61	10.60	9.43	**9.30**	**11.67**	9.57	9.14	**10.13**	8.41	9.03	**8.72**	**10.28**
49.	GW 2015-693 (D)	**11.53**	9.64	8.82	8.74	10.72	10.10	**9.60**	**11.94**	9.60	8.80	**10.11**	8.76	9.61	**9.19**	**10.47**
50.	GW 2015-699 (D)	**11.54**	9.49	10.22	8.93	10.68	9.96	**9.86**	**11.93**	9.33	8.85	**10.04**	8.46	9.62	**9.04**	**10.48**
51.	GW 2015-703 (D)	**11.51**	8.82	8.58	8.99	10.74	9.70	**9.37**	**11.68**	9.04	9.39	**10.04**	8.45	9.01	**8.73**	**10.26**
52.	GW 2015-705 (D)	**11.72**	9.29	9.74	9.38	10.92	10.25	**9.92**	**11.76**	9.57	9.88	**10.40**	9.21	9.56	**9.39**	**10.64**
53.	UP-2672 (C)	**11.51**	9.33	8.91	8.61	10.71	9.73	**9.46**	**11.56**	8.97	8.96	**9.83**	8.63	10.16	**9.40**	**10.35**
54.	QLD 90	**11.63**	9.19	9.02	8.36	10.44	9.54	**9.31**	**11.81**	8.93	9.01	**9.92**	8.46	9.60	**9.03**	**10.34**
55.	QLD 91	**11.22**	8.75	8.82	8.20	10.31	9.36	**9.09**	**11.89**	8.69	8.83	**9.80**	8.26	9.40	**8.83**	**10.17**
56.	QLD 92	**11.55**	8.73	8.87	8.52	10.49	9.76	**9.27**	**11.21**	9.08	9.28	**9.86**	8.65	9.77	**9.21**	**10.22**
57.	QLD 93	**11.62**	9.26	9.56	8.48	10.75	9.92	**9.59**	**12.31**	9.11	9.57	**10.33**	8.82	9.53	**9.18**	**10.61**
58.	QLD 94	**11.53**	9.16	8.50	8.69	10.87	9.73	**9.39**	**11.75**	9.05	9.53	**10.11**	8.57	9.84	**9.21**	**10.40**
59.	HUW 1522	**11.54**	9.54	9.83	8.96	10.84	9.95	**9.82**	**11.50**	9.02	9.50	**10.01**	8.74	9.74	**9.24**	**10.42**
60.	HUW 1525	**11.66**	8.94	8.61	8.35	10.66	9.58	**9.23**	**11.97**	9.05	9.13	**10.05**	8.45	9.88	**9.17**	**10.41**
61.	RAJ 4493	**11.56**	9.35	8.88	8.30	10.83	9.85	**9.44**	**12.37**	8.79	9.42	**10.19**	8.44	9.91	**9.18**	**10.55**
62.	RAJ 4494	**11.83**	8.96	8.50	8.32	10.77	9.44	**9.20**	**11.56**	8.56	8.63	**9.58**	8.00	9.43	**8.72**	**10.18**
63.	RAJ 4501	**11.71**	9.51	9.16	9.06	10.89	10.20	**9.76**	**11.78**	9.29	9.57	**10.21**	9.29	9.61	**9.45**	**10.58**
64.	RAJ 4496	**11.82**	8.99	8.31	8.37	10.71	9.81	**9.24**	**11.81**	8.89	9.22	**9.97**	8.73	9.75	**9.24**	**10.42**
65.	RAJ 4500	**11.68**	9.66	9.79	9.12	10.71	9.73	**9.80**	**11.76**	8.98	8.89	**9.88**	8.57	9.40	**8.99**	**10.42**
Mean		**11.55**	**9.15**	**9.01**	**8.60**	**10.58**	**9.65**	**9.40**	**11.80**	**8.73**	**9.17**	**9.90**	**8.59**	**9.57**	**9.08**	**10.34**

Table: 13: Quality Analysis of Quality Component Screening Nursery of Preliminary Entries

Sr. No.	QCSN Entries	Grain Appearance (Max -10.0)	Test Weight (kg/hl)	Protein Content (%)	Grain Hardness Index	Sedimen-tation Value (ml)	Moisture Content (%)
66	HI 1613	6.6	82.2	10.31	71	44	9.67
67	HI 1615	6.7	81.0	10.50	70	60	9.71
68	HI 8777	6.8	83.0	11.34	90	50	10.71
69	HI 8790	7.3	81.8	11.90	95	53	10.15
70	HI 8791	7.2	81.5	11.14	88	46	10.21
71	AKAW 4896	7.5	83.0	12.15	86	35	10.08
72	AKAW 5012	7.7	82.0	12.62	75	42	10.21
73	DWAP 1621	7.4	78.5	11.89	81	50	10.33
74	DWAP 1622	6.3	79.2	11.50	74	60	9.52
75	JWS 608	7.3	81.4	12.21	78	49	10.17
76	JWS 710	6.5	80.2	11.19	77	44	9.65
77	JWS 734	6.2	78.0	13.04	87	48	9.56
78	JWS 809	6.5	81.4	11.68	76	63	9.44
79	JWS 819	6.4	80.0	14.39	79	58	9.55
80	JWS 825	6.4	81.4	12.32	79	62	9.60
81	JWS 829	6.3	80.3	12.96	69	58	9.25
82	JWS 835	6.4	81.0	12.58	83	57	10.25
83	JWS 855	6.3	75.6	14.46	76	59	9.56
84	JWS 150	6.5	79.0	11.66	76	63	10.14
85	Local Collection 1c 01	6.0	83.0	14.59	90	63	9.67
86	UP 2994	6.6	82.5	15.10	70	60	9.59
87	UP 2995	6.2	77.2	11.41	83	65	9.50
88	UP 2996	6.7	83.2	10.70	74	64	9.70
89	UP 2997	7.2	81.6	12.24	91	60	10.09
90	UP 2998	6.2	81.0	11.25	88	61	10.04
91	T.NIAW-1	6.4	83.0	12.07	77	43	9.84
92	HD 2189	6.4	83.4	11.79	76	36	9.80
93	TAW 33	6.5	80.6	11.46	93	56	9.77
94	T-NIAW 97	6.3	78.6	11.21	84	54	9.75
95	9th ATEMRRSAM 148	6.5	80.0	11.07	77	62	9.82
96	GW 2016-731	6.9	83.5	11.29	67	54	9.63
97	GW 2016-732	6.3	81.5	11.36	86	44	9.11
98	GW 2016-733	6.1	72.0	13.78	84	50	9.84
99	GW 2016-734	6.3	81.5	11.71	83	34	9.66
100	GW 2016-735	6.5	83.2	12.38	76	54	9.38
101	GW 2016-736	6.5	80.5	11.04	82	48	9.88
102	GW 2016-737	6.5	80.4	11.55	76	43	9.25
103	GW 2016-738	6.6	81.3	11.00	83	61	9.70
104	GW 2016-739	6.2	83.2	10.16	78	44	9.12
105	GW 2016-740	6.7	81.4	11.94	81	63	9.46
106	GW 2016-741	6.9	83.5	10.88	77	33	9.46
107	GW 2016-742	6.3	81.0	11.05	77	55	9.66
108	GW 2016-743	6.8	83.0	10.67	84	44	9.71
109	GW 2016-744	6.6	82.4	10.97	74	40	9.70
110	GW 2016-745	6.4	82.5	10.80	67	38	9.87
111	GW 2016-746	6.4	83.5	10.03	75	40	9.84
112	GW 2016-747	6.7	83.0	12.04	74	61	9.87
113	GW 2016-748	6.4	82.0	10.96	77	40	9.54
114	GW 2016-749	6.2	82.5	11.59	75	43	9.83
115	GW 2016-793 (D)	6.6	84.0	12.65	89	38	9.86
116	GW 2016-794 (D)	7.4	83.2	11.64	92	40	9.94
117	GW 2016-772 (D)	6.3	76.2	15.33	71	23	10.40
118	GW 2016-773 (D)	7.7	83.0	11.78	80	30	9.87
119	GW 2016-774 (D)	6.5	76.7	12.38	87	38	9.56
120	GW 2016-775 (D)	7.2	81.2	13.92	92	40	10.02
121	GW 2016-776 (D)	7.1	81.4	13.56	85	26	9.63
122	GW 2016-777 (D)	6.6	75.3	13.31	76	26	10.28
123	GW 2016-778 (D)	6.4	81.5	12.65	99	34	9.97
124	GW 2016-779 (D)	7.0	80.6	12.82	86	37	10.28
125	GW 2016-772 (D)	6.5	82.5	11.93	97	38	10.25
	Mean	**6.6**	**81.0**	**12.00**	**81**	**48**	**9.80**

Evaluation of Processing and Nutritional Quality of National Wheat Nurseries

During the year (2016-17), 103,108 and 80 lines including checks belonging to NGSN, EIGN and NDSN were grown at IIWBR Research Farm, Karnal. All the lines of these three nurseries were analysed for processing quality parameters viz. test weight, protein content, grain hardness index, moisture content & sedimentation value and also for nutritional quality parameters like iron & zinc. Different processing and nutritional quality parameters showed wide variability (Table 14).

Table14: Variability in Processing and Nutritional Quality Parameters

Parameter	NGSN	EIGN	NDSN
Test Weight (Kg/hl)	80.0 (73.2-83.7)	81.2 (77.5-83.7)	81.8 (74.4-83.7)
Protein Content (%)	11.70 (8.91-14.03)	11.54 (9.51-13.41)	11.24 (8.46-13.38)
Sedimentation Value(ml)	49 (36-65)	54 (35-66)	38 (31-46)
Grain Hardness Index	83 (22-99)	72 (22-98)	95 (76-108)
Iron (ppm)	39.3 (33.7-45.8)	37.7 (32.9-44.7)	36.3 (32.0-44.2)
Zinc (ppm)	32.1 (25.7-39.6)	29.6 (22.3-34.7)	30.6 (25.2-40.0)

Attempts were made to identify promising genotypes for various processing and nutritional quality parameters from all the 3 nurseries viz. NGSN (Table15), EIGN-I (Table16) and NDSN (Table17).

Table15: Promising Genotypes for Processing and Nutritional Quality Parameters (NGSN)

Parameters	Value	Genotypes
Test Weight (kg/hl)	>83.0	K 1204, HD 4730 (d), HI 8750 (d), UAS 446 (d), HI 8755 (d), DBW 93, HD 4758 (d), HI 1605, HI 8708 (d)
Protein Content (%)	>13.00	VL 3004, VL 977, K0607, DBW 172, AKAW 4924, AKDW 5012 (d), AKDW 5013 (d), LBPY 2013-3
Sedimentation Value (ml)	~65	DBW 129, HPW 373, PBW 677, VL 1004, HD 2967, HI 1605, DBW 172, HI 1604, HI 1615
Grain Hardness Index	>95	TL 2995 (T), HI 9713 (d), HI 8737 (d), HPW 360, HI 8759 (d), MACS 3949 (d), AKDW 5013 (d), KBRL 78-2, KBRL81-1
	<45	HS 547, NIAW 2064
Iron (ppm)	>45.0	PBW 677, PBW 723, PBW 681, VL 967, HD 4758 (d), AKDW 5012 (d), KB 2013-05
Zinc (ppm)	~40.0	TI 2995 (T), MP 3336, DBW 172, AKAW 4924, KB 2013-05

Table 16: Promising Genotypes for Processing and Nutritional Quality Parameters (EIGN)

Parameters	Value	Genotypes
Test Weight (kg/hl)	>83.0	36th ESWYT 126, 23rd HRWYT 242, 248, 33th SAWSN 3151, 3152, 3186, 48th IBWSN 1294, 14th HTWYT 25, 26, 39, 26th HRWSN 2003, 2017, DBW 88, 10th STERMRRSN 6039
Protein Content (%)	>12.50	36th ESWYT 13023rd SAWYT 318, 33th SAWSN 3186, 3080, 3201, 3205, 3284, DBW 88, 48th IBWSN 1004, 1157, 1299
Sedimentation value (ml)	~63	36th ESWYT 126, 23rd HRWYT 240, 17th KBSN 30, 23rd, SAWYT 310, 346, 33th SAWSN 3186, 14th HTWYT 39, 26th HRWSN 2006
Grain Hardness Index	>85	23rd SAWYT 310, 314, HI 1544, 7th HLBSN 11, 19, K 1006, DBW 88, 26 HRWSN 2056,
	<45	36th ESWYT 149, 17th KBSN 49, 50, 23rd SAWYT 321, 322, 33th SAWSN 3268, 48th IBWSN 1297, 1299, 14th HTWYT 21, 1st SATYT 35, 90
Iron (ppm)	>40.0	HI 1544, 23rd SAWYT 321, 346, 33th SAWSN 3152, 3015, DBW 88, 48th IBWSN 1157, 1191, 1283, K 1006, 14th HTWYT 21, 39, 26th HRWSN 2006, 2042
Zinc (ppm)	~35.0	17th KBSN 14, 7th HLBSN 18, 40, 49, 26th HRWSN 2006, 2017,1st SATYT 39, K 1006

Table 17: Promising Genotypes for Processing and Nutritional Quality Parameters (NDSN)

Parameters	Value	Genotypes
Test Weight (kg/hl)	>83.5	47th IDSN 7033, 7036, 7070, 7079, 7081, 7085, 7090, 7142, 7144, HI 8498, PDW 291, 47th IDYN 725, 729, 736, HI 8737, HI 8796, HI 8799, HI 8800
Protein Content (%)	>12.50	PDW 291, 47th IDSN 7142, 7144, 47th IDYN 708
Sedimentation value (ml)	>41	47th IDSN 7036, 7085, 7138, 47th IDYN 742, 745, HI 8797, HI 8799
Grain Hardness Index	>100	47th IDSN 7104, 7129, 7136, 7138, 7142, PDW 291, 47th IDYN 712, 715, 717, 729, 739, HI 8498
Iron (ppm)	>40.0	PDW 291, HI 8737, HI 8498, 47th IDSN 40.3, 708, HI 8801
Zinc (ppm)	>35.0	47th IDSN 7082, 7138, PDW 291, 47th IDYN 708, 730, 746, HI 8498

Detailed results have been present in Table 18 (NGSN), Table19 (EIGN) and Table 20 (NDSN).

Table 18: Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nurseries (NGSN-2016-17)

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
Resistant to all three rusts								
1	DBW 129	81.0	12.34	9.41	65	81	41.1	28.8
2	VL 1003	78.0	11.97	9.99	45	75	38.7	27.9
3	HPW 373	80.6	11.99	9.50	63	80	39.6	34.5
4	HS 593	79.2	10.64	9.55	53	74	34.8	26.1
5	TL 2995 (T)	74.0	12.78	9.93	36	95	38.6	42.9
6	TL 2999 (T)	77.5	12.34	9.87	30	94	39.5	36.3
7	TL 2996 (T)	74.0	11.95	9.78	36	92	36.4	30.4
8	PBW 677	81.8	12.16	10.03	63	83	46.5	30.5
9	PBW 723	82.7	11.90	9.53	48	87	47.3	34.9
10	PBW 681	82.0	10.63	9.54	63	90	45.3	30.2
11	HPW 411	79.2	11.67	9.84	46		40.1	32.2
Resistant to Stem & Leaf rust								
12	HUW 666	81.4	12.24	9.63	61	85	39.7	30.0
13	VL 967	77.0	11.33	9.26	54	64	51.5	26.5
14	DBW 154	78.2	11.77	9.24	47	91	36.0	29.5
15	HD 2932-Lr/Sr25	78.5	11.56	9.10	55	80	38.7	34.3
16	HD 3133	77.8	11.13	9.54	52	87	36.3	33.2
17	HUW 675	78.3	11.43	10.04	44	93	38.5	35.6
18	VL 1004	79.3	12.46	9.72	63	86	36.2	32.2
19	VL 3004	80.8	13.41	9.16	52	84	43.6	34.6
20	DBW 110	81.3	11.17	9.40	60	73	37.0	30.9
21	VL 977	81.0	13.06	9.51	49	82	42.0	34.0
22	HD 3132	79.0	12.58	9.54	62	87	38.0	31.1
23	HS 547	81.0	12.49	8.94	45	22	40.9	31.4
24	HS 595	80.6	12.33	9.51	60	85	39.2	33.7
25	GW 455	80.2	11.37	9.81	55	87	41.9	31.6
26	HD 3146	80.0	10.21	9.68	36	78	39.9	28.1
27	HUW 677	75.5	10.56	9.63	50	83	34.4	30.3
28	PBW 701	82.0	11.94	9.42	44	78	42.9	33.6
29	UP 2864	80.7	11.42	9.54	46	74	41.4	31.9
30	UP 2891	79.7	10.10	9.67	45	87	41.3	32.1
30A	*Sonalika ©*	82.5	11.55	9.47	40	86	37.8	30.5
30B	*HD 2967 (C)*	76.7	11.73	9.28	62	79	33.8	30.7
30C	*HI 8713 (D) (C)*	80.0	11.40	9.84	40	97	35.0	34.2
30D	*Infector*	79.0	10.31	9.26	40	86	38.5	32.1

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
Resistant to Leaf & Stripe rusts								
31	HS 592	81.3	11.92	9.32	54	82	37.8	34.7
32	HUW 661	81.0	10.16	9.28	51	64	40.2	30.9
33	K 1204	83.0	11.41	9.81	50	77	38.2	29.5
34	PBW 695	82.0	10.82	9.26	62	76	38.4	28.6
35	PBW 698	82.0	11.12	9.28	53	70	37.7	32.2
Resistant to all three rusts								
36	DDW 30 (d)	81.5	9.95	9.57	41	83	37.4	28.7
37	HD 4728 (d)	75.4	9.31	9.40	40	74	41.2	25.7
38	HD 4730 (d)	83.7	8.91	9.20	37	75	38.3	27.1
39	HI 8750 (d)	83.6	10.91	9.91	40	83	43.5	34.8
Resistant to Leaf & Stripe rusts								
40	UAS 446 (d)	83.0	12.03	9.74	39	86	39.4	32.4
41	HI 8755 (d)	83.2	9.62	9.94	38	84	37.6	31.6
II. New Agronomic bases (Contributor: SK Singh)								
42	DBW 71	82.6	11.01	9.87	42	79	40.4	31.2
43	DBW 88	82.7	10.80	9.35	60	77	38.4	27.5
44	DBW 93	83.4	10.73	9.35	45	81	35.5	30.8
45	DBW 107	82.5	11.50	9.19	43	80	40.6	32.5
46	K 1006	81.0	10.79	9.43	41	86	40.4	32.2
47	NW 5054	80.2	9.97	9.49	57	71	36.4	30.0
48	HI 8713 (d)	80.8	10.51	9.34	40	89	34.3	32.6
49	HI 8737 (d)	81.5	12.26	9.61	40	98	44.7	35.3
50	HD 4758 (d)	83.2	11.28	9.70	39	90	45.4	34.9
51	MP 3336	80.8	11.80	9.53	43	83	42.7	38.6
52	NMP 3382	82.0	12.51	9.43	53	76	38.3	35.2
53	HPW 360	73.5	12.85	10.09	56	97	36.9	32.0
54	HPW 368	80.0	11.03	9.84	59	87	38.5	30.5
55	GW 451	78.0	10.63	9.72	54	87	38.9	28.0
56	GW 463	77.3	11.20	9.40	48	72	40.3	29.7
57	K 0402	77.5	10.90	9.58	57	85	33.7	26.4
58	K 0607	78.0	13.03	9.49	56	87	38.9	35.9
59	NIAW 1994	81.2	11.43	9.77	42	85	37.4	30.0
60	K 1317	82.5	12.61	9.48	52	79	40.6	32.7
60A	***Sonalika (C)***	81.4	11.91	8.98	42	83	35.6	34.7
60B	***HD 2967 (C)***	77.2	12.19	9.27	63	82	37.5	30.9
60C	***HI 8713 (D) (C)***	79.5	12.03	9.54	45	97	35.7	31.2
60D	***Infector***	78.0	11.71	9.52	48	85	35.3	34.0
61	HI 8759 (d)	81.0	11.98	9.92	41	98	38.4	36.0
62	HI 1605	83.0	12.00	9.32	63	84	37.2	31.2
63	MACS 3949 (d)	82.7	11.96	9.45	38	95	36.7	34.0

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tation Value (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
III. Elite Lines								
64	DBW 172	82.7	13.88	9.09	64	77	43.4	38.5
65	DBW 179	80.3	12.59	9.56	61	84	44.1	33.7
66	HI 1604	79.3	11.09	9.85	65	73	36.3	31.4
67	HI 1615	79.5	12.55	9.72	64	85	38.7	30.4
68	Raj 4238	82.0	10.36	9.19	54	82	40.5	32.5
69	AKAW 4924	81.5	13.07	9.54	46	67	42.8	38.0
70	AKDW 5012 (d)	79.0	14.03	9.91	41	94	45.8	36.0
71	AKDW 5013 (d)	81.0	13.38	10.07	37	97	42.3	35.3
IV. Yield Component Lines from YCSN								
72	LBPY 2013-1	79.0	12.59	9.57	44	72	39.8	31.2
73	LBPY 2013-3	79.0	13.02	9.74	58	88	42.4	35.0
74	NIAW 2349	78.2	12.93	9.40	62	76	36.8	34.7
75	LBPY 2013-5	81.7	11.66	9.48	43	83	38.2	33.3
76	NIAW 2064	81.5	12.38	9.41	38	44	44.6	36.1
77	Raj 4393	78.0	12.35	9.39	40	79	40.0	33.9
78	HI 1600	78.6	11.13	9.82	39	86	38.0	33.1
79	Raj 4350	81.0	12.77	9.52	44	79	42.9	33.9
80	Raj 4394	80.0	11.89	9.86	51	84	40.8	34.3
81	KB 2013-05	80.3	12.72	9.77	38	77	45.2	39.6
IV. Genetic Stocks								
82	PHSL 5	79.0	12.48	10.16	46	76	38.1	31.1
83	PHSL 10	79.0	11.73	9.96	45	79	38.4	30.0
84	PHSL 11	81.2	12.38	9.61	57	79	37.0	28.9
85	HI 8708 (d)	83.0	11.59	9.80	40	92	39.1	30.3
86	KBRL 77-1	73.2	10.89	9.28	40	80	35.1	31.9
87	KBRL 78-2	77.3	11.69	9.37	50	99	34.3	30.3
88	KBRL 79-2	78.8	12.47	9.38	45	94	39.7	32.8
89	KBRL 81-1	77.6	12.21	9.44	45	97	38.9	30.9
90	KBRL 82-2	81.2	12.19	9.55	46	87	40.9	29.5
91	KBRL 83-3	81.4	12.41	9.75	45	92	37.8	30.0
91 A	***Sonalika (C)***	80.4	12.41	9.54	42	83	37.1	29.5
91B	***HD 2967 (C)***	80.0	11.52	9.38	62	81	37.5	29.8
91C	***HI 8713 (D) (C)***	79.0	11.21	9.63	40	93	34.6	27.4
91D	***Infector***	78.7	10.62	9.63	39	83	35.1	27.7
	Mean	**80.0**	**11.70**	**9.56**	**49**	**83**	**39.3**	**32.1**
	Mimimum	**73.2**	**8.91**	**8.94**	**36**	**22**	**33.7**	**25.7**
	Maximim	**83.7**	**14.03**	**10.16**	**65**	**99**	**45.8**	**39.6**

Table 19: Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nurseries (EIGN) for year 2016-17

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationVaue (ml)	Grain Hardness	Iron (ppm)	Zinc (ppm)
1	17th KBSN 14	82.0	11.47	9.46	54	75	38.5	34.2
2	36th ESWYT 110	80.0	10.77	9.01	50	70	39.4	31.3
3	36th ESWYT 117	82.5	10.84	9.32	45	64	34.9	30.1
4	36th ESWYT 126	83.0	12.12	8.57	62	67	39.5	29.2
5	36th ESWYT 130	81.6	12.51	9.44	57	74	36.9	30.1
6	36th ESWYT 131	79.5	11.41	9.13	53	72	35.2	30.9
7	36th ESWYT 137	81.0	11.44	9.57	57	81	37.5	26.3
7A	**DBW88 (Check)**	81.0	11.92	9.18	60	80	37.7	26.7
8	36th ESWYT 149	82.6	11.88	8.75	58	37	39.1	30.5
9	23rd HRWYT 206	81.0	10.98	9.31	57	84	36.4	27.9
10	23rd HRWYT 207	79.6	10.15	8.95	56	75	35.3	31.6
11	23rd HRWYT 240	81.0	9.99	8.97	62	76	34.5	29.6
12	23rd HRWYT 242	83.0	10.33	8.79	58	69	36.4	27.8
13	23rd HRWYT 248	83.0	11.37	8.93	61	66	38.0	27.3
14	17th KBSN 30	82.0	10.73	9.00	63	77	34.8	25.6
14B	**K1006 (Check)**	81.0	10.80	9.03	39	84	35.8	27.2
15	17th KBSN 47	81.0	11.51	8.88	52	84	38.6	27.2
16	17th KBSN 49	79.5	11.38	8.91	45	33	37.9	29.3
17	17th KBSN 50	80.6	10.89	8.91	42	38	38.7	30.0
18	17th KBSN 78	80.5	11.27	8.76	48	66	34.9	27.4
18C	**HI 1544 (Check)**	78.0	11.00	9.37	55	86	40.3	28.6
19	23rd SAWYT 304	82.0	10.45	9.55	51	64	36.7	27.2
19D	**UAS 304 (Check)**	81.0	11.85	8.87	46	73	39.6	29.9
20	23rd SAWYT 310	79.3	12.07	9.63	62	87	36.1	25.0
21	23rd SAWYT 314	81.3	12.16	9.26	60	86	37.4	29.9
22	23rd SAWYT 318	82.5	12.51	8.72	55	41	39.7	29.1
22B	**K1006 (Check)**	79.6	11.33	9.38	40	83	38.2	31.2
23	23rd SAWYT 321	81.5	12.19	8.38	56	34	41.6	33.0
24	23rd SAWYT 322	79.8	12.13	8.78	55	77	36.7	31.3
25	23rd SAWYT 322	80.7	12..04	8.39	61	30	38.7	29.0
25C	**HI 1544 (Check)**	81.0	11.47	9.80	52	90	39.7	28.3
26	23rd SAWYT 340	81.4	12.21	9.44	60	78	39.3	28.4
27	23rd SAWYT 346	81.0	11.80	9.19	63	81	42.1	32.0
28	33th SAWSN 3151	83.0	12.08	9.52	61	71	39.1	30.6
28D	**UAS 304 (Check)**	81.7	11.17	9.07	46	79	39.6	32.2
29	33th SAWSN 3152	83.0	11.56	9.14	60	82	40.4	29.8
30	33th SAWSN 3186	83.2	12.83	9.08	63	67	37.0	31.1

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationVaue (ml)	Grain Hardness	Iron (ppm)	Zinc (ppm)
31	33th SAWSN 3190	80.0	12.00	8.95	60	70	35.7	30.3
32	33th SAWSN 3268	78.0	12.32	9.18	53	22	35.2	29.3
33	33th SAWSN 3015	81.7	11.74	9.13	55	76	41.0	32.4
33A	**DBW88 (Check)**	81.0	12.74	9.28	61	81	40.2	29.7
34	33th SAWSN 3020	81.0	12.31	9.63	61	88	37.6	27.8
35	33th SAWSN 3080	80.8	12.89	9.20	60	82	37.5	29.5
36	33th SAWSN 3201	82.4	13.41	9.06	58	49	38.8	32.1
37	33th SAWSN 3205	79.5	12.59	9.23	56	77	37.5	30.2
38	33th SAWSN 3284	81.2	12.61	9.04	58	57	37.9	31.6
39	48th IBWSN 1004	82.2	12.80	8.69	56	81	36.6	30.0
40	48th IBWSN 1016	80.6	11.88	8.84	60	70	37.3	29.5
41	48th IBWSN 1059	81.6	12.01	9.40	59	75	38.7	31.5
42	48th IBWSN 1157	81.7	12.95	8.98	53	80	40.3	29.3
43	48th IBWSN 1182	81.5	11.73	9.32	58	84	36.2	30.0
43C	**HI 1544 (Check)**	77.5	12.15	9.14	53	95	40.0	28.4
44	48th IBWSN 1193	82.2	10.37	9.39	60	74	37.0	28.2
45	48th IBWSN 1189	81.0	10.59	9.27	49	82	36.7	29.0
46	48th IBWSN 1191	81.0	12.28	9.22	61	84	40.3	30.2
46D	**UAS 304 (Check)**	79.5	12.49	9.04	43	80	37.4	29.9
47	48th IBWSN 1283	80.6	11.99	9.29	55	76	44.7	31.4
48	48th IBWSN 1284	81.6	11.23	9.10	57	82	37.5	26.1
49	48th IBWSN 1294	83.0	11.06	9.02	58	74	35.4	31.0
49B	**K1006 (Check)**	78.6	11.38	8.99	35	82	37.1	32.9
50	48th IBWSN 1297	79.8	11.51	8.56	42	42	36.1	29.1
51	48th IBWSN 1298	77.5	11.73	9.00	54	79	35.7	24.4
52	48th IBWSN 1299	81.8	12.93	8.64	52	36	38.1	31.0
53	7th HLBSN 11	82.0	11.85	9.37	61	87	38.0	28.3
53A	**DBW88 (Check)**	80.8	13.39	9.40	60	84	35.7	27.6
54	7th HLBSN 18	81.5	11.51	9.31	43	74	33.3	34.5
55	7th HLBSN 19	81.4	11.90	8.99	55	85	36.2	28.4
56	7th HLBSN 25	82.3	12.19	9.91	50	77	37.7	32.2
57	7th HLBSN 28	82.5	12.09	8.70	49	59	37.3	29.4
58	7th HLBSN 29	81.3	11.42	9.39	58	75	37.3	26.9
59	7th HLBSN 40	78.6	9.95	8.81	53	51	38.8	33.4
60	7th HLBSN 49	81.2	11.71	8.92	53	77	39.7	34.7
61	14th HTWYT 1	81.4	10.74	8.95	57	78	38.0	30.3
62	14th HTWYT 3	78.6	11.21	9.12	56	81	38.3	28.9
63	14th HTWYT 7	80.3	11.69	9.06	54	72	37.3	28.2
63B	K**1006 (Check)**	78.6	11.81	9.27	40	89	40.7	31.3
64	14th HTWYT 9	80.0	11.20	9.25	60	75	37.5	29.8
65	14th HTWYT 13	81.8	10.11	8.70	57	68	38.3	28.8

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationVaue (ml)	Grain Hardness	Iron (ppm)	Zinc (ppm)
66	14th HTWYT 16	80.6	11.23	9.10	51	72	39.8	30.2
67	14th HTWYT 21	82.0	11.57	9.00	55	22	40.5	32.0
67D	**UAS 304 (Check)**	81.2	11.26	9.04	45	76	36.2	31.9
68	14th HTWYT 25	83.5	11.32	8.97	51	74	36.6	28.2
69	14th HTWYT 26	83.0	11.26	9.06	58	76	35.2	26.3
70	14th HTWYT 28	82.0	10.88	9.20	59	73	36.7	27.6
71	14th HTWYT 31	81.6	9.82	9.14	57	69	35.5	27.6
71A	**DBW88 (Check)**	82.0	11.93	9.69	60	89	35.3	27.4
72	14th HTWYT 39	83.7	11.56	9.62	63	82	40.3	32.9
73	26th HRWSN 2003	83.5	10.32	9.04	59	80	35.8	31.1
74	26th HRWSN 2004	82.2	9.51	8.81	40	54	32.9	22.3
75	26th HRWSN 2006	81.0	10.31	9.60	64	74	43.0	33.1
75C	**HI 1544 (Check)**	79.0	10.78	9.35	49	98	43.4	29.9
76	26th HRWSN 2017	83.0	11.20	8.98	54	70	36.1	31.1
77	26th HRWSN 2042	82.7	12.09	8.99	48	69	40.5	30.8
78	26th HRWSN 2056	79.5	11.65	10.26	53	91	34.0	26.1
79	1st SATYT 35	82.5	11.35	8.67	56	41	38.2	29.4
80	1st SATYT 39	80.5	12.22	8.87	54	74	36.1	34.6
81	1st SATYT 82	80.0	12.21	8.90	51	47	35.5	29.7
82	1st SATYT 90	80.8	12.38	9.15	55	35	35.8	32.7
82A	**DBW88 (Check)**	83.6	12.24	9.57	61	88	38.4	28.2
83	10th STEMRRSN 6038	82.3	10.18	9.40	65	83	36.5	29.0
84	10th STEMRRSN 6039	83.2	11.08	9.17	60	79	38.0	30.7
84B	**K1006 (Check)**	81.3	10.34	9.27	35	92	38.4	33.2
85	10th STEMRRSN 6152	82.2	11.89	9.19	66	71	39.1	29.0
86	10th STEMRRSN 6153	82.0	11.13	9.13	50	72	38.1	28.4
86C	**HI 1544 (Check)**	79.0	10.75	9.38	52	97	37.1	27.8
87	10th STEMRRSN 6170	81.0	11.15	9.16	56	76	37.4	26.6
88	10th STEMRRSN 6173	79.7	10.29	9.19	45	66	33.6	27.5
88D	**UAS 304 (Check)**	81.0	11.58	9.19	40	81	36.5	30.0
	Mean	**81.2**	**11.54**	**9.13**	**54**	**72**	**37.7**	**29.6**
	Minimum	**77.5**	**9.51**	**8.38**	**35**	**22**	**32.9**	**22.3**
	Maximum	**83.7**	**13.41**	**10.26**	**66**	**98**	**44.7**	**34.7**

Table 20: Evaluation of Processing & Nutritional Quality Parameters of National Wheat Nurseries (NDSN) for year 2016-17

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationVaue (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
1	47th IDSN 7007	83.0	11.90	9.28	34	101	36.5	28.9
2	47th IDSN 7017	83.0	11.70	9.62	39	98	34.1	30.0
3	47th IDSN 7020	82.4	10.21	9.72	39	85	32.1	28.0
4	47th IDSN 7030	82.0	9.75	9.32	37	90	33.1	33.9
5	47th IDSN 7033	83.2	10.68	9.64	40	93	33.2	26.6
5A	**HI8498 (C)**	83.7	11.20	9.97	40	90	38.4	32.0
6	47th IDSN 7036	83.7	10.21	9.48	41	87	34.1	29.2
7	47th IDSN 7049	82.7	10.00	9.30	35	88	34.7	27.6
8	47th IDSN 7050	82.0	10.67	10.12	33	88	34.7	28.6
9	47th IDSN 7055	80.5	11.60	9.97	38	97	35.7	29.2
10	47th IDSN 7056	79.2	10.67	9.38	40	90	33.3	25.2
10B	**PDW 291 (C)**	83.2	10.73	9.71	31	93	35.2	32.4
11	47th IDSN 7058	79.0	9.90	9.73	35	82	33.1	27.2
12	47th IDSN 7070	83.3	11.08	9.70	40	87	35.3	32.5
13	47th IDSN 7073	81.6	10.55	9.54	38	89	32.9	29.4
14	47th IDSN 7079	83.2	12.24	9.65	37	98	35.6	31.1
15	47th IDSN 7081	83.2	11.10	9.63	38	93	37.5	32.0
15C	**HI 8737 (C)**	83.0	11.68	10.15	38	98	38.6	31.5
16	47th IDSN 7082	83.0	11.93	9.58	39	100	37.2	37.6
17	47th IDSN 7085	83.5	9.92	9.40	41	91	34.5	30.2
18	47th IDSN 7090	83.6	10.32	9.55	40	97	33.6	26.2
19	47th IDSN 7091	81.5	10.18	9.41	36	96	34.6	28.6
20	47th IDSN 7095	82.7	10.61	9.34	38	98	33.6	27.6
20A	**HI8498 (C)**	83.3	11.28	9.78	37	96	38.3	28.7
21	47th IDSN 7096	80.0	10.52	9.92	39	100	38.0	31.9
22	47th IDSN 7098	81.0	11.06	9.53	39	98	34.5	26.7
23	47th IDSN 7102	80.4	11.90	9.56	40	93	35.3	29.8
24	47th IDSN 7104	81.8	12.25	9.73	40	108	34.0	29.0
25	47th IDSN 7109	80.8	12.05	9.39	38	95	33.7	30.2
25B	**PDW 291 (C)**	80.0	13.38	10.24	33	101	41.5	40.0
26	47th IDSN 7113	81.4	11.64	9.84	36	97	36.0	29.8
27	47th IDSN 7118	81.3	12.15	9.73	36	95	36.3	33.3
28	47th IDSN 7127	82.2	11.59	9.45	38	98	35.6	32.3
29	47th IDSN 7129	79.5	11.63	9.56	39	102	36.5	31.9
30	47th IDSN 7133	79.4	11.77	9.52	38	102	37.3	27.8

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationVaue (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
30C	**HI 8737 (C)**	83.0	12.03	9.71	35	97	41.0	30.4
31	47th IDSN 7136	81.7	12.30	9.78	38	108	38.5	30.2
32	47th IDSN 7137	81.0	11.68	9.93	39	99	39.0	33.8
33	47th IDSN 7138	83.0	11.53	9.82	41	102	38.5	36.4
34	47th IDSN 7142	81.8	12.53	10.31	39	105	35.7	32.7
35	47th IDSN 7144	81.6	12.54	9.65	36	100	38.8	32.0
35A	**HI8498 (C)**	82.2	12.08	10.02	37	95	40.2	31.0
36	47th IDYN 701	80.0	12.07	9.68	33	99	36.7	31.9
37	47th IDYN 705	77.6	12.31	9.49	39	94	40.3	32.6
38	47th IDYN 706	80.5	11.62	9.63	36	100	34.0	29.5
39	47th IDYN 707	83.0	10.91	9.89	39	98	34.4	31.4
40	47th IDYN 708	78.0	12.76	9.78	40	98	40.0	35.7
40B	**PDW 291 (C)**	81.3	12.50	9.65	33	101	38.6	34.8
41	47th IDYN 712	81.0	12.15	9.49	36	104	37.4	30.8
42	47th IDYN 715	81.0	11.99	9.62	37	103	34.7	28.3
43	47th IDYN 717	78.5	11.75	9.94	37	101	34.4	30.3
44	47th IDYN 721	80.8	11.44	9.63	39	96	36.2	29.6
45	47th IDYN 722	82.4	10.17	9.39	36	96	35.8	28.2
45C	**HI 8737 (C)**	83.7	10.43	9.69	35	89	36.5	31.3
46	47th IDYN 725	83.2	9.76	9.17	33	86	32.4	29.9
47	47th IDYN 726	81.2	10.79	9.74	32	94	34.9	30.2
48	47th IDYN 729	83.5	10.11	9.21	38	95	36.6	29.2
49	47th IDYN 730	82.5	11.47	9.73	37	103	37.0	36.6
50	47th IDYN 734	74.4	12.45	10.16	34	88	37.7	31.9
50A	**HI8498 (C)**	83.4	11.50	9.85	40	101	37.8	36.2
51	47th IDYN 736	83.3	11.77	10.17	38	96	35.7	26.5
52	47th IDYN 737	81.8	11.15	9.35	34	93	34.8	26.7
53	47th IDYN 739	81.2	11.26	9.67	36	101	37.1	29.9
54	47th IDYN 740	81.8	10.20	9.49	38	95	36.9	27.6
55	47th IDYN 741	81.6	10.91	9.37	37	94	37.4	29.5
55B	**PDW 291 (C)**	81.8	12.69	9.55	33	98	39.1	34.2
56	47th IDYN 742	82.8	11.60	10.01	41	98	37.1	29.4
57	47th IDYN 745	77.5	11.87	9.55	42	100	36.7	33.9
58	47th IDYN 746	80.1	11.15	9.98	39	93	39.7	36.7
59	HI 8795	83.0	10.62	9.63	38	96	32.0	26.0
60	HI 8796	83.2	11.29	10.28	40	89	35.7	28.2

Sr. No	Entry	Processing Quality					Nutritional Quality	
		Test Weight (kghl)	Protein Content (%)	Moisture Content (%)	Sedimen-tationValue (ml)	Grain Hardness Index	Iron (ppm)	Zinc (ppm)
60C	**HI 8737 (C)**	83.0	11.18	10.26	36	91	44.2	31.4
61	HI 8797	82.5	8.46	9.07	41	76	35.3	27.8
62	HI 8798	83.0	9.67	9.79	38	86	35.1	30.2
63	HI 8799	83.3	10.14	9.63	42	87	38.4	32.0
64	HI 8800	83.7	10.90	9.79	46	100	38.3	28.7
65	HI 8801	83.0	11.18	9.80	38	100	40.2	31.0
65A	**HI 8498 (C)**	83.6	10.87	9.43	41	78	34.5	26.8
65B	**PDW 291 (C)**	82.2	10.23	9.76	40	97	36.0	32.2
65C	**HI 8737 (C)**	83.5	10.82	9.69	37	92	37.4	30.9
	Mean	**81.8**	**11.24**	**9.68**	**38**	**95**	**36.3**	**30.6**
	Minimum	**74.4**	**8.46**	**9.07**	**31**	**76**	**32.0**	**25.2**
	Maximum	**83.7**	**13.38**	**10.31**	**46**	**108**	**44.2**	**40.0**

SECTION E

WHEAT PRODUCTS EVALUATION

AVTs

i. **Chapati**

ii. **Bread**

iii. **Biscuit**

iv. **Pasta**

WHEAT PRODUCTS EVALUATION

All the 2nd year and 1st year AVT entries including checks were evaluated for chapati, bread & biscuit from *T.aestivum* and pasta products from *T. durum* in all the centres, sowing conditions and zones. Various aspects covered in this chapter are chapati quality (maximum score 10.0), phenol test (maximum score 10.0), bread loaf volume (ml), bread loaf volume (ml)/dough weight (g), bread quality (maximum score 10.0), extraction rate (%), wet gluten (%), dry gluten (%), gluten index, biscuit diameter (cm), biscuit spread factor of *T.aestivum,* pasta cooking quality and pasta sensory evaluation of *T. durum*.

Chapati Quality (Table 1-10)

For the evaluation of chapati quality, various parameters like water absorption, nature &colour of dough (before and after maturation), chapati appearance, colour, aroma, taste, puffing height, pliability and loss of water (just after and after 4 hrs of baking) were considered and the score was given out of 10.0.

The phenol test (table 6-10) was carried out on all the samples. Depending upon the degree of darkness, score was given out of 10.0. The phenol test score was found to correlate negatively with chapati quality score. The entries which made excellent chapatti with>8.0 score invariably developed very verylight brown colour. This technique is simple and can be easily used in screening the genotypes for chapati. Since different varieties develop different degree of darkness, this technique may be used in identifying mixtures of wheat varieties.

Bread Quality (Table 11- 45)

Among various parameters, loaf volume (Table 11-15) is considered most important and is given maximum weightage while evaluating bread quality. In general, bread loaf volume was comparatively better in PZ. For the evaluation of bread quality (Table 16-20), various parameters like loaf volume, stickness, appearance, crust colour, texture, taste and aroma were considered and the score was given out of 10.0. The ratio of bread loaf volume (ml) / dough weight (g) is considered important (Table 21-25), while evaluating bread quality where value of >3.5 is considered appropriate for good quality bread.

Extraction rate (Table 26-30) is important parameter for milers, who are interested in a wheat variety with higher flour recovery. Wet Gluten (Table 31-35), Dry Gluten (36-40) and Gluten Index (41-45) are associated with the quality of the end products of wheat.

Table 1:Chapati Quality (Max–10) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	7.67	7.78	7.70	7.50	7.75	**7.68**
2. WH 1105 (C)	7.70	7.60	7.75	7.55	7.60	**7.64**
3. DBW 88 (C)	7.75	7.60	7.70	7.80	7.65	**7.70**
4. HD 3086 (C)	7.75	7.55	7.60	7.55	7.75	**7.64**
5. DBW 189	7.70	7.60	7.55	7.60	7.70	**7.63**
6. DBW 196	7.96	8.11	8.05	7.95	8.15	**8.04**
7. PBW 750	7.80	7.65	7.80	7.55	7.60	**7.68**
8. WH 1202	7.60	7.50	7.70	7.65	7.60	**7.61**
9. HD 3226	7.65	7.70	7.80	7.70	7.60	**7.69**
10. UP 2942	7.96	8.20	7.90	8.15	8.05	**8.05**
11. HP 1963	7.60	7.65	7.75	7.55	7.60	**7.63**
12. BRW 3773	7.55	7.60	7.50	7.65	7.60	**7.58**
Mean	**7.72**	**7.71**	**7.73**	**7.68**	**7.72**	**7.71**
Irrigated, Late Sown						
1. DBW 173	7.75	7.65	7.60	7.55	7.70	**7.65**
2. HD 3059 (C)	7.70	7.60	7.50	7.55	7.70	**7.61**
3. DBW 90 (C)	7.75	7.70	7.55	7.60	7.60	**7.64**
4. WH 1021 (C)	7.75	7.65	7.60	7.50	7.55	**7.61**
5. WH 1124 (C)	7.65	7.70	7.55	7.60	7.65	**7.63**
6. PBW 752	7.55	7.60	7.50	7.55	7.60	**7.56**
7. HI 1617	7.65	7.65	7.55	7.50	7.55	**7.58**
Mean	**7.69**	**7.65**	**7.55**	**7.55**	**7.62**	**7.61**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	7.60	-	7.55	7.60	7.70	**7.61**
2. PBW 644 (C)	7.70	-	7.60	7.60	7.70	**7.65**
3. HD 3043 (C)	7.65	-	7.70	7.70	7.75	**7.70**
4. WH 1142 (C)	7.70	-	7.65	7.70	7.80	**7.71**
5. HD 3237	7.65	-	7.75	7.60	7.70	**7.68**
6. HI 1619	7.75	-	7.80	7.65	7.65	**7.71**
7. HI 1620	7.70	-	7.60	7.50	7.60	**7.60**
8. CG 1023	7.95	-	8.15	8.05	8.10	**8.06**
9. MP 1318	8.00	-	8.20	8.10	8.05	**8.09**
10. MACS 6677	7.65	-	7.60	7.70	7.70	**7.66**
Mean	**7.74**	**-**	**7.76**	**7.72**	**7.78**	**7.75**

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

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	7.75	7.60	7.70	**7.68**
2. K 0307 (C)	7.60	7.75	7.75	**7.70**
3. DBW 39 (C)	7.95	8.10	8.05	**8.03**
4. K 1006 (C)	7.80	7.60	7.70	**7.70**
5. HD 2967 (C)	7.70	7.65	7.75	**7.70**
6. DBW 187	7.75	7.60	7.55	**7.63**
7. HD 3219	7.60	7.50	7.70	**7.60**
Mean	**7.74**	**7.69**	**7.74**	**7.72**
Restricted Irrigation, Timely Sown				
1. HI 1612	7.67	7.55	7.70	**7.64**
2. HD2888 (C)	8.15	8.05	8.10	**8.10**
3. C 306 (C)	8.10	8.15	8.20	**8.15**
4. K 8027 (C)	8.15	8.20	8.20	**8.18**
5. HD 3171 (I)	7.65	7.60	7.75	**7.67**
6. K 1317 (I)	8.05	8.15	7.95	**8.05**
7. HI 1620	7.60	7.50	7.65	**7.58**
8. HS 611	7.70	7.65	7.75	**7.70**
9. UAS 384	8.05	7.95	8.00	**8.00**
Mean	**7.90**	**7.87**	**7.92**	**7.90**

Table 3: Chapati Quality (Max–10)of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	7.90	7.75	7.80	7.85	**7.83**
2. DBW 110 (C)	7.85	7.75	7.90	7.90	**7.85**
3. BRW 3775	7.70	7.85	7.80	7.90	**7.81**
4. UAS 385	7.90	7.80	7.95	7.85	**7.88**
Mean	**7.84**	**7.79**	**7.86**	**7.88**	**7.84**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	8.20	8.15	8.10	**8.15**
2. MACS 6478 (C)	8.15	8.05	8.10	**8.10**
3. MACS 6222 (C)	7.80	7.90	7.75	**7.82**
4. GW 322 (C)	7.85	7.80	7.75	**7.80**
5. UAS 304 (C)	7.85	7.90	7.95	**7.90**
Mean	**7.97**	**7.96**	**7.93**	**7.95**
Rainfed, Timely Sown				
1. UAS 375	7.75	7.90	7.85	**7.83**
2. NI 5439 (C)	7.80	7.85	7.80	**7.82**
3. NIAW 1415 (C)	8.05	8.15	8.10	**8.10**
Mean	**7.87**	**7.97**	**7.92**	**7.92**

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

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	7.50	**7.50**
2. CoW (W) 1 (C)	7.55	**7.55**
3. HW 5216 (C)	7.45	**7.45**
4. UAS 387	7.55	**7.55**
Mean	**7.51**	**7.51**

Table 6:Phenol Test (Max–10) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	5.5	5.0	6.0	6.0	5.0	**5.5**
2. WH 1105 (C)	6.0	6.5	6.0	6.5	6.5	**6.3**
3. DBW 88 (C)	6.0	6.5	6.5	6.0	6.5	**6.3**
4. HD 3086 (C)	5.5	6.0	6.5	6.0	5.5	**5.9**
5. DBW 189	6.0	6.5	6.5	6.5	6.0	**6.3**
6. DBW 196	2.5	2.0	2.5	2.0	2.0	**2.2**
7. PBW 750	4.5	5.5	4.0	5.5	5.0	**4.9**
8. WH 1202	5.5	6.0	5.0	6.0	6.0	**5.7**
9. HD 3226	5.5	5.5	5.0	5.5	6.0	**5.5**
10. UP 2942	2.5	1.5	2.5	2.0	2.0	**2.1**
11. HP 1963	5.5	5.5	5.0	6.0	5.5	**5.5**
12. BRW 3773	6.0	6.0	6.0	6.0	6.0	**6.0**
Mean	**5.1**	**5.2**	**5.1**	**5.3**	**5.2**	**5.2**
Irrigated, Late Sown						
1. DBW 173	5.5	6.0	7.0	7.5	7.0	**6.6**
2. HD 3059 (C)	5.5	6.5	7.0	7.0	6.0	**6.4**
3. DBW 90 (C)	5.5	5.5	6.5	6.5	6.0	**6.0**
4. WH 1021 (C)	5.0	6.0	6.0	6.5	6.5	**6.0**
5. WH 1124 (C)	6.0	5.5	6.5	6.5	6.0	**6.1**
6. PBW 752	6.0	6.0	6.5	6.5	6.0	**6.2**
7. HI 1617	5.5	5.5	6.5	6.5	6.5	**6.1**
Mean	**5.6**	**5.9**	**6.6**	**6.7**	**6.3**	**6.2**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	5.5	-	6.0	6.0	5.5	**5.8**
2. PBW 644 (C)	5.5	-	6.0	5.5	5.5	**5.6**
3. HD 3043 (C)	5.5	-	5.5	5.5	5.0	**5.4**
4. WH 1142 (C)	5.0	-	5.5	5.5	5.0	**5.3**
5. HD 3237	5.5	-	5.0	6.0	5.5	**5.5**
6. HI 1619	5.0	-	5.0	6.0	5.5	**5.4**
7. HI 1620	5.5	-	6.0	6.5	6.0	**6.0**
8. CG 1023	2.5	**-**	1.5	2.5	2.0	**2.1**
9. MP 1318	2.5	**-**	2.0	2.5	2.0	**2.3**
10. MACS 6677	5.0	**-**	6.0	5.5	5.5	**5.5**
Mean	**4.8**	**-**	**4.9**	**5.2**	**4.8**	**4.9**

Table 7: Phenol Test (Max–10) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	5.5	6.5	5.5	**5.8**
2. K 0307 (C)	6.0	5.5	5.5	**5.7**
3. DBW 39 (C)	2.5	2.0	2.5	**2.3**
4. K 1006 (C)	5.0	6.0	5.5	**5.5**
5. HD 2967 (C)	5.5	6.0	5.5	**5.7**
6. DBW 187	5.5	6.0	6.0	**5.8**
7. HD 3219	6.0	6.5	5.5	**6.0**
Mean	**5.1**	**5.5**	**5.1**	**5.3**
Restricted Irrigation, Timely Sown				
1. HI 1612	6.0	6.5	6.0	**6.2**
2. HD2888 (C)	1.5	2.0	1.5	**1.7**
3. C 306 (C)	1.5	1.5	1.0	**1.3**
4. K 8027 (C)	2.5	2.0	2.5	**2.3**
5. HD 3171 (I)	5.5	6.5	5.5	**5.8**
6. K 1317 (I)	2.0	1.5	2.5	**2.0**
7. HI 1620	6.0	6.5	6.0	**6.2**
8. HS 611	5.5	5.5	5.5	**5.5**
9. UAS 384	2.5	3.0	2.5	**2.7**
Mean	**3.7**	**3.9**	**3.7**	**3.7**

Table 8: Phenol Test (Max–10)of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	5.0	6.0	5.5	5.5	**5.5**
2. DBW 110 (C)	5.0	6.0	5.5	5.5	**5.5**
3. BRW 3775	6.5	5.5	5.5	5.0	**5.6**
4. UAS 385	5.0	5.5	5.0	5.5	**5.3**
Mean	**5.4**	**5.8**	**5.4**	**5.4**	**5.5**

Table 9: Phenol Test (Max–10) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	1.5	2.0	1.5	**1.7**
2. MACS 6478 (C)	1.5	2.0	1.5	**1.7**
3. MACS 6222 (C)	5.5	5.0	6.0	**5.5**
4. GW 322 (C)	5.0	5.0	5.5	**5.2**
5. UAS 304 (C)	5.5	5.0	4.5	**5.0**
Mean	**3.8**	**3.8**	**3.8**	**3.8**
Rainfed, Timely Sown				
1. UAS 375	6.5	5.0	6.0	**5.8**
2. NI 5439 (C)	6.5	5.0	6.0	**5.8**
3. NIAW 1415 (C)	2.5	2.0	2.5	**2.3**
Mean	**5.2**	**4.0**	**4.8**	**4.7**

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

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	6.5	**6.5**
2. CoW (W) 1 (C)	5.5	**5.5**
3. HW 5216 (C)	6.5	**6.5**
4. UAS 387	6.0	**6.0**
Mean	**6.1**	**6.1**

Table 11: Bread Loaf Volume (ml) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	555	570	565	560	550	**560**
2. WH 1105 (C)	550	575	570	550	555	**560**
3. DBW 88 (C)	555	575	565	560	550	**561**
4. HD 3086 (C)	550	570	570	565	560	**563**
5. DBW 189	560	580	575	560	565	**568**
6. DBW 196	555	570	570	555	550	**560**
7. PBW 750	550	575	570	560	545	**560**
8. WH 1202	545	580	565	555	555	**560**
9. HD 3226	555	580	570	560	560	**565**
10. UP 2942	560	570	565	555	560	**562**
11. HP 1963	555	565	555	545	540	**552**
12. BRW 3773	560	570	560	550	560	**560**
Mean	**554**	**573**	**567**	**556**	**554**	**561**
Irrigated, Late Sown						
1. DBW 173	560	575	570	560	570	**567**
2. HD 3059 (C)	565	570	580	565	570	**570**
3. DBW 90 (C)	550	565	570	560	565	**562**
4. WH 1021 (C)	555	565	570	565	570	**565**
5. WH 1124 (C)	555	570	560	555	565	**561**
6. PBW 752	560	580	580	560	565	**569**
7. HI 1617	540	550	560	545	550	**549**
Mean	**555**	**568**	**570**	**559**	**565**	**563**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	570	-	565	550	550	**559**
2. PBW 644 (C)	575	-	550	555	545	**556**
3. HD 3043 (C)	575	-	570	560	555	**565**
4. WH 1142 (C)	560	-	575	560	555	**563**
5. HD 3237	565	-	560	555	550	**558**
6. HI 1619	560	-	555	540	540	**549**
7. HI 1620	570	-	565	555	545	**559**
8. CG 1023	565	-	575	570	555	**566**
9. MP 1318	570	-	560	550	555	**559**
10. MACS 6677	570	-	575	545	540	**558**
Mean	**568**	**-**	**565**	**554**	**549**	**559**

Table 12: Bread Loaf Volume (ml) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	560	575	570	**568**
2. K 0307 (C)	565	570	565	**567**
3. DBW 39 (C)	560	565	570	**565**
4. K 1006 (C)	550	565	565	**560**
5. HD 2967 (C)	550	570	565	**562**
6. DBW 187	545	565	570	**560**
7. HD 3219	550	560	570	**560**
Mean	**554**	**567**	**568**	**563**
Restricted Irrigation, Timely Sown				
1. HI 1612	535	525	495	**518**
2. HD2888 (C)	550	540	510	**533**
3. C 306 (C)	515	520	485	**507**
4. K 8027 (C)	545	530	510	**528**
5. HD 3171 (I)	540	515	505	**520**
6. K 1317 (I)	530	535	510	**525**
7. HI 1620	525	505	480	**503**
8. HS 611	505	490	485	**493**
9. UAS 384	520	505	485	**503**
Mean	**529**	**518**	**496**	**515**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	525	530	555	550	**540**
2. DBW 110 (C)	515	505	550	540	**528**
3. BRW 3775	520	510	560	545	**534**
4. UAS 385	525	530	555	545	**539**
Mean	**521**	**519**	**555**	**545**	**535**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	550	560	555	**555**
2. MACS 6478 (C)	580	575	575	**577**
3. MACS 6222 (C)	580	580	575	**578**
4. GW 322 (C)	560	565	565	**563**
5. UAS 304 (C)	565	575	580	**573**
Mean	**567**	**571**	**570**	**569**
Rainfed, Timely Sown				
1. UAS 375	590	595	580	**588**
2. NI 5439 (C)	585	600	580	**588**
3. NIAW 1415 (C)	590	585	575	**583**
Mean	**588**	**593**	**578**	**587**

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

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	545	**545**
2. CoW (W) 1 (C)	540	**540**
3. HW 5216 (C)	540	**540**
4. UAS 387	545	**545**
Mean	**543**	**543**

Table 16: Bread Quality (Max–10) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	6.67	6.90	6.77	6.70	6.50	**6.71**
2. WH 1105 (C)	6.50	7.00	6.80	6.50	6.60	**6.68**
3. DBW 88 (C)	6.70	6.96	6.67	6.67	6.47	**6.69**
4. HD 3086 (C)	6.52	6.92	6.77	6.80	6.70	**6.74**
5. DBW 189	6.72	7.10	7.02	6.70	6.80	**6.87**
6. DBW 196	6.65	6.90	6.82	6.60	6.50	**6.69**
7. PBW 750	6.46	7.02	6.80	6.67	6.40	**6.67**
8. WH 1202	6.40	7.12	6.70	6.57	6.60	**6.68**
9. HD 3226	6.70	7.08	6.82	6.70	6.67	**6.79**
10. UP 2942	6.55	6.92	6.67	6.60	6.70	**6.69**
11. HP 1963	6.65	6.80	6.60	6.40	6.30	**6.55**
12. BRW 3773	6.67	6.90	6.72	6.50	6.70	**6.70**
Mean	**6.60**	**6.97**	**6.76**	**6.62**	**6.58**	**6.71**
Irrigated, Late Sown						
1. DBW 173	6.72	7.05	6.92	6.70	6.90	**6.86**
2. HD 3059 (C)	6.82	6.92	7.12	6.80	6.92	**6.92**
3. DBW 90 (C)	6.52	6.82	6.90	6.72	6.80	**6.75**
4. WH 1021 (C)	6.62	6.80	6.88	6.82	6.90	**6.80**
5. WH 1124 (C)	6.60	6.90	6.70	6.60	6.82	**6.72**
6. PBW 752	6.70	7.12	7.10	6.70	6.80	**6.88**
7. HI 1617	6.30	6.50	6.70	6.40	6.50	**6.48**
Mean	**6.61**	**6.87**	**6.90**	**6.68**	**6.81**	**6.77**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	6.90	-	6.80	6.52	6.50	**6.68**
2. PBW 644 (C)	7.00	-	6.50	6.62	6.42	**6.64**
3. HD 3043 (C)	7.02	-	6.92	6.72	6.62	**6.82**
4. WH 1142 (C)	6.70	-	7.00	6.70	6.57	**6.74**
5. HD 3237	6.82	-	6.70	6.60	6.50	**6.66**
6. HI 1619	6.67	-	6.60	6.30	6.30	**6.47**
7. HI 1620	6.92	-	6.82	6.60	6.40	**6.69**
8. CG 1023	6.80	-	7.02	6.92	6.60	**6.84**
9. MP 1318	6.92	-	6.70	6.50	6.62	**6.69**
10. MACS 6677	6.90	-	7.00	6.40	6.32	**6.66**
Mean	**6.87**	**-**	**6.81**	**6.59**	**6.49**	**6.69**

Table 17: Bread Quality (Max–10) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	6.75	7.05	6.95	**6.92**
2. K 0307 (C)	6.85	6.95	6.85	**6.88**
3. DBW 39 (C)	6.72	6.85	6.92	**6.83**
4. K 1006 (C)	6.55	6.80	6.82	**6.72**
5. HD 2967 (C)	6.50	6.92	6.85	**6.76**
6. DBW 187	6.45	6.82	6.95	**6.74**
7. HD 3219	6.65	6.72	6.92	**6.76**
Mean	**6.64**	**6.87**	**6.89**	**6.80**
Restricted Irrigation, Timely Sown				
1. HI 1612	6.15	5.95	4.80	**5.63**
2. HD2888 (C)	6.45	6.25	5.35	**6.02**
3. C 306 (C)	5.75	5.75	4.60	**5.37**
4. K 8027 (C)	6.35	6.05	5.40	**5.93**
5. HD 3171 (I)	6.25	5.55	5.15	**5.65**
6. K 1317 (I)	6.05	6.40	5.35	**5.93**
7. HI 1620	5.95	5.15	4.25	**5.12**
8. HS 611	5.15	4.60	4.40	**4.72**
9. UAS 384	5.75	5.15	4.35	**5.08**
Mean	**5.98**	**5.65**	**4.85**	**5.49**

Table 18: Bread Quality (Max–10)of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	5.95	6.15	6.60	6.45	**6.29**
2. DBW 110 (C)	5.50	5.15	6.47	6.25	**5.84**
3. BRW 3775	6.35	5.30	6.67	6.35	**6.17**
4. UAS 385	6.45	6.15	6.55	6.30	**6.36**
Mean	**6.06**	**5.69**	**6.57**	**6.34**	**6.17**

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

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	6.62	6.80	6.72	**6.71**
2. MACS 6478 (C)	7.20	7.12	7.15	**7.16**
3. MACS 6222 (C)	7.25	7.30	7.20	**7.25**
4. GW 322 (C)	6.82	6.92	6.95	**6.90**
5. UAS 304 (C)	6.92	7.15	7.25	**7.11**
Mean	**6.96**	**7.06**	**7.05**	**7.02**
Rainfed, Timely Sown				
1. UAS 375	7.40	7.45	7.25	**7.37**
2. NI 5439 (C)	7.35	7.60	7.20	**7.38**
3. NIAW 1415 (C)	7.45	7.32	7.10	**7.29**
Mean	**7.40**	**7.46**	**7.18**	**7.35**

Table 20:Bread Quality (Max–10) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	6.35	**6.35**
2. CoW (W) 1 (C)	6.25	**6.25**
3. HW 5216 (C)	6.20	**6.20**
4. UAS 387	6.40	**6.40**
Mean	**6.30**	**6.30**

Table 21: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	3.31	3.40	3.37	3.34	3.28	**3.34**
2. WH 1105 (C)	3.28	3.43	3.40	3.28	3.31	**3.34**
3. DBW 88 (C)	3.31	3.43	3.37	3.34	3.28	**3.35**
4. HD 3086 (C)	3.28	3.40	3.40	3.37	3.34	**3.36**
5. DBW 189	3.34	3.46	3.43	3.34	3.37	**3.39**
6. DBW 196	3.31	3.40	3.40	3.31	3.28	**3.34**
7. PBW 750	3.28	3.43	3.40	3.34	3.25	**3.34**
8. WH 1202	3.25	3.46	3.37	3.31	3.31	**3.34**
9. HD 3226	3.31	3.46	3.40	3.34	3.34	**3.37**
10. UP 2942	3.34	3.40	3.37	3.31	3.34	**3.35**
11. HP 1963	3.31	3.37	3.31	3.25	3.22	**3.29**
12. BRW 3773	3.34	3.40	3.34	3.28	3.34	**3.34**
Mean	**3.31**	**3.42**	**3.38**	**3.32**	**3.31**	**3.35**
Irrigated, Late Sown						
1. DBW 173	3.34	3.43	3.40	3.34	3.40	**3.38**
2. HD 3059 (C)	3.37	3.40	3.46	3.37	3.40	**3.40**
3. DBW 90 (C)	3.28	3.37	3.40	3.34	3.37	**3.35**
4. WH 1021 (C)	3.31	3.37	3.40	3.37	3.40	**3.37**
5. WH 1124 (C)	3.31	3.40	3.34	3.31	3.37	**3.35**
6. PBW 752	3.34	3.46	3.46	3.34	3.37	**3.39**
7. HI 1617	3.22	3.28	3.34	3.25	3.28	**3.27**
Mean	**3.31**	**3.39**	**3.40**	**3.33**	**3.37**	**3.36**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	3.40	-	3.37	3.28	3.28	**3.33**
2. PBW 644 (C)	3.43	-	3.28	3.31	3.25	**3.32**
3. HD 3043 (C)	3.43	-	3.40	3.34	3.31	**3.37**
4. WH 1142 (C)	3.34	-	3.43	3.34	3.31	**3.36**
5. HD 3237	3.37	-	3.34	3.31	3.28	**3.33**
6. HI 1619	3.34	-	3.31	3.22	3.22	**3.27**
7. HI 1620	3.40	-	3.37	3.31	3.25	**3.33**
8. CG 1023	3.37	-	3.43	3.40	3.31	**3.38**
9. MP 1318	3.40	-	3.34	3.28	3.31	**3.33**
10. MACS 6677	3.40	-	3.43	3.25	3.22	**3.33**
Mean	**3.39**	**-**	**3.37**	**3.30**	**3.27**	**3.33**

Table 22: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	3.34	3.43	3.40	**3.39**
2. K 0307 (C)	3.37	3.40	3.37	**3.38**
3. DBW 39 (C)	3.34	3.37	3.40	**3.37**
4. K 1006 (C)	3.28	3.37	3.37	**3.34**
5. HD 2967 (C)	3.28	3.40	3.37	**3.35**
6. DBW 187	3.25	3.37	3.40	**3.34**
7. HD 3219	3.28	3.34	3.40	**3.34**
Mean	**3.31**	**3.38**	**3.39**	**3.36**
Restricted Irrigation, Timely Sown				
1. HI 1612	3.19	3.13	2.96	**3.09**
2. HD2888 (C)	3.28	3.22	3.04	**3.18**
3. C 306 (C)	3.07	3.10	2.90	**3.02**
4. K 8027 (C)	3.25	3.16	3.04	**3.15**
5. HD 3171 (I)	3.22	3.07	3.01	**3.10**
6. K 1317 (I)	3.16	3.19	3.04	**3.13**
7. HI 1620	3.13	3.01	2.87	**3.00**
8. HS 611	3.01	2.93	2.90	**2.95**
9. UAS 384	3.10	3.01	2.90	**3.00**
Mean	**3.16**	**3.09**	**2.96**	**3.07**

Table 23: Bread Loaf Volume (ml) / Dough Weight (g)of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	3.13	3.16	3.31	3.28	**3.22**
2. DBW 110 (C)	3.07	3.01	3.28	3.22	**3.15**
3. BRW 3775	3.10	3.04	3.34	3.25	**3.18**
4. UAS 385	3.13	3.16	3.31	3.25	**3.21**
Mean	**3.11**	**3.09**	**3.31**	**3.25**	**3.19**

Table 24: Bread Loaf Volume (ml) / Dough Weight (g) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	3.28	3.34	3.31	**3.31**
2. MACS 6478 (C)	3.46	3.43	3.43	**3.44**
3. MACS 6222 (C)	3.46	3.46	3.43	**3.45**
4. GW 322 (C)	3.34	3.37	3.37	**3.36**
5. UAS 304 (C)	3.37	3.43	3.46	**3.42**
Mean	**3.38**	**3.41**	**3.40**	**3.396**
Rainfed, Timely Sown				
1. UAS 375	3.52	3.55	3.46	**3.51**
2. NI 5439 (C)	3.49	3.58	3.46	**3.51**
3. NIAW 1415 (C)	3.52	3.49	3.43	**3.48**
Mean	**3.51**	**3.54**	**3.45**	**3.50**

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

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	3.25	**3.25**
2. CoW (W) 1 (C)	3.22	**3.22**
3. HW 5216 (C)	3.22	**3.22**
4. UAS 387	3.25	**3.25**
Mean	**3.24**	**3.24**

Table 26: Extraction Rate (%) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	69.1	68.8	70.1	69.9	68.6	**69.3**
2. WH 1105 (C)	68.6	71.2	70.1	69.6	69.9	**69.9**
3. DBW 88 (C)	69.9	72.1	70.1	71.1	68.8	**70.4**
4. HD 3086 (C)	68.1	69.9	69.7	70.5	67.5	**69.1**
5. DBW 189	67.9	68.6	69.1	67.6	68.1	**68.3**
6. DBW 196	69.1	70.1	69.2	68.9	68.1	**69.1**
7. PBW 750	68.8	69.8	69.6	68.6	67.1	**68.8**
8. WH 1202	69.2	71.1	70.3	70.8	69.6	**70.2**
9. HD 3226	68.9	70.6	69.2	69.9	68.1	**69.3**
10. UP 2942	67.1	67.6	68.1	69.1	67.6	**67.9**
11. HP 1963	67.5	69.7	68.6	67.1	67.6	**68.1**
12. BRW 3773	67.7	68.1	67.9	68.4	67.6	**67.9**
Mean	**68.5**	**69.8**	**69.3**	**69.3**	**68.2**	**69.0**
Irrigated, Late Sown						
1. DBW 173	68.5	68.1	68.7	68.5	69.7	**68.7**
2. HD 3059 (C)	69.6	68.7	69.3	68.8	70.2	**69.3**
3. DBW 90 (C)	69.8	68.6	70.3	71.3	72.3	**70.5**
4. WH 1021 (C)	67.7	68.1	69.3	68.8	70.1	**68.8**
5. WH 1124 (C)	69.7	69.1	70.6	70.9	71.2	**70.3**
6. PBW 752	68.6	68.8	71.2	69.1	69.6	**69.5**
7. HI 1617	67.6	68.2	67.9	67.1	68.8	**67.9**
Mean	**68.8**	**68.5**	**69.6**	**69.2**	**70.3**	**69.3**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	69.3	-	70.1	69.6	69.1	**69.5**
2. PBW 644 (C)	69.8	-	69.9	69.7	68.2	**69.4**
3. HD 3043 (C)	72.1	-	71.8	70.8	70.1	**71.2**
4. WH 1142 (C)	71.8	-	70.8	70.6	69.6	**70.7**
5. HD 3237	68.1	-	67.9	68.6	68.2	**68.2**
6. HI 1619	69.6	-	71.2	69.1	68.1	**69.5**
7. HI 1620	68.8	-	69.8	70.1	67.6	**69.1**
8. CG 1023	68.9	-	69.1	68.6	68.1	**68.7**
9. MP 1318	71.2	-	71.8	69.6	69.1	**70.4**
10. MACS 6677	69.8	-	71.6	69.6	68.9	**70.0**
Mean	**69.9**	**-**	**70.4**	**69.6**	**68.7**	**69.7**

Table 27: Extraction Rate (%) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	68.6	72.3	73.2	**71.4**
2. K 0307 (C)	71.6	73.8	72.8	**72.7**
3. DBW 39 (C)	68.9	72.6	70.2	**70.6**
4. K 1006 (C)	68.6	72.8	73.1	**71.5**
5. HD 2967 (C)	71.3	73.8	69.2	**71.4**
6. DBW 187	68.9	69.3	69.0	**69.1**
7. HD 3219	67.2	68.1	67.6	**67.6**
Mean	**69.3**	**71.8**	**70.7**	**70.6**
Restricted Irrigation, Timely Sown				
1. HI 1612	68.1	73.1	71.8	**71.0**
2. HD2888 (C)	68.3	73.8	73.9	**72.0**
3. C 306 (C)	68.5	74.2	73.8	**72.2**
4. K 8027 (C)	68.3	72.8	73.2	**71.4**
5. HD 3171 (I)	67.9	69.6	68.7	**68.7**
6. K 1317 (I)	67.7	70.2	68.8	**68.9**
7. HI 1620	68.1	69.6	69.8	**69.2**
8. HS 611	64.6	65.1	67.1	**65.6**
9. UAS 384	68.2	70.1	69.6	**69.3**
Mean	**67.7**	**70.9**	**70.7**	**69.8**

Table 28: Extraction Rate (%) of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	69.3	68.8	69.9	70.2	**69.6**
2. DBW 110 (C)	68.8	68.1	70.3	69.6	**69.2**
3. BRW 3775	68.5	68.1	70.8	71.2	**69.7**
4. UAS 385	69.2	69.9	73.6	72.8	**71.4**
Mean	**69.0**	**68.7**	**71.2**	**71.0**	**69.9**

Table 29: Extraction Rate (%) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	67.3	66.5	67.2	**67.0**
2. MACS 6478 (C)	69.8	69.9	70.1	**69.9**
3. MACS 6222 (C)	72.3	71.5	71.7	**71.8**
4. GW 322 (C)	71.8	70.6	71.6	**71.3**
5. UAS 304 (C)	72.8	70.6	69.6	**71.0**
Mean	**70.8**	**69.8**	**70.0**	**70.2**
Rainfed, Timely Sown				
1. UAS 375	73.6	74.1	72.8	**73.5**
2. NI 5439 (C)	74.1	69.6	70.1	**71.3**
3. NIAW 1415 (C)	73.8	73.2	72.1	**73.0**
Mean	**73.8**	**72.3**	**71.7**	**72.6**

Table 30:Extraction Rate (%) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	72.1	**72.1**
2. CoW (W) 1 (C)	73.8	**73.8**
3. HW 5216 (C)	71.8	**71.8**
4. UAS 387	72.6	**72.6**
Mean	**72.6**	**72.6**

Table 31: Wet Gluten (%) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	27.0	34.6	28.0	23.9	24.5	**27.6**
2. WH 1105 (C)	25.9	32.9	29.9	23.2	27.0	**27.8**
3. DBW 88 (C)	25.0	33.0	30.4	24.6	27.0	**28.0**
4. HD 3086 (C)	25.4	32.5	31.4	23.3	25.3	**27.6**
5. DBW 189	29.6	35.7	31.8	24.5	26.1	**29.5**
6. DBW 196	26.9	33.5	31.1	25.6	24.8	**28.4**
7. PBW 750	26.1	33.3	30.3	26.7	23.6	**28.0**
8. WH 1202	26.6	35.9	31.3	26.1	28.9	**29.8**
9. HD 3226	28.8	36.3	33.5	28.1	32.1	**31.8**
10. UP 2942	27.6	34.7	30.8	25.6	28.1	**29.4**
11. HP 1963	25.1	31.6	29.1	23.2	23.1	**26.4**
12. BRW 3773	26.8	31.8	29.8	25.9	31.2	**29.1**
Mean	**26.7**	**33.8**	**30.6**	**25.1**	**26.8**	**28.6**
Irrigated, Late Sown						
1. DBW 173	26.6	31.6	28.9	25.3	29.1	**28.3**
2. HD 3059 (C)	26.8	31.4	28.9	26.6	27.7	**28.3**
3. DBW 90 (C)	26.1	34.2	30.8	24.6	27.2	**28.6**
4. WH 1021 (C)	27.2	32.3	30.4	29.3	32.1	**30.3**
5. WH 1124 (C)	25.5	32.1	30.1	24.6	28.2	**28.1**
6. PBW 752	28.1	33.2	34.1	28.5	29.1	**30.6**
7. HI 1617	24.2	28.6	30.6	26.1	27.5	**27.4**
Mean	**26.4**	**31.9**	**30.5**	**26.4**	**28.7**	**28.8**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	29.8	-	28.4	26.6	23.7	**27.1**
2. PBW 644 (C)	34.9	-	25.8	30.8	21.9	**28.4**
3. HD 3043 (C)	36.9	-	34.0	24.9	26.8	**30.7**
4. WH 1142 (C)	32.6	-	35.1	23.7	23.6	**28.8**
5. HD 3237	30.2	-	27.1	24.3	22.3	**26.0**
6. HI 1619	28.6	-	29.1	23.5	21.1	**25.6**
7. HI 1620	32.8	-	30.1	27.3	26.1	**29.1**
8. CG 1023	31.3	-	31.6	31.1	24.6	**29.7**
9. MP 1318	33.4	-	28.6	26.1	26.7	**28.7**
10. MACS 6677	31.6	-	32.3	23.8	20.3	**27.0**
Mean	**32.2**	**-**	**30.2**	**26.2**	**23.7**	**28.1**

Table 32: Wet Gluten (%) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	22.0	31.7	27.0	**26.9**
2. K 0307 (C)	24.2	33.0	29.7	**29.0**
3. DBW 39 (C)	22.4	29.1	28.2	**26.6**
4. K 1006 (C)	20.4	29.6	29.3	**26.4**
5. HD 2967 (C)	25.0	33.5	29.6	**29.4**
6. DBW 187	23.1	31.6	29.3	**28.0**
7. HD 3219	24.6	30.1	30.1	**28.3**
Mean	**23.1**	**31.2**	**29.0**	**27.8**
Restricted Irrigation, Timely Sown				
1. HI 1612	29.0	25.4	19.9	**24.8**
2. HD2888 (C)	30.7	28.9	22.7	**27.4**
3. C 306 (C)	29.7	27.5	24.0	**27.1**
4. K 8027 (C)	31.0	29.4	23.4	**27.9**
5. HD 3171 (I)	27.6	23.7	24.0	**25.1**
6. K 1317 (I)	30.0	29.5	25.3	**28.3**
7. HI 1620	31.3	28.8	23.6	**27.9**
8. HS 611	30.6	27.1	25.6	**27.8**
9. UAS 384	29.1	27.6	24.1	**26.9**
Mean	**29.9**	**27.5**	**23.6**	**27.0**

Table 33: Wet Gluten (%) of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	25.1	25.8	33.9	33.0	**29.5**
2. DBW 110 (C)	22.9	21.0	33.9	31.0	**27.2**
3. BRW 3775	22.3	23.1	33.3	30.6	**27.3**
4. UAS 385	23.1	24.3	34.1	29.8	**27.8**
Mean	**23.4**	**23.6**	**33.8**	**31.1**	**28.0**

Table 34: Wet Gluten (%) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	28.4	30.5	29.3	**29.4**
2. MACS 6478 (C)	30.5	31.9	31.7	**31.4**
3. MACS 6222 (C)	34.5	33.0	31.3	**32.9**
4. GW 322 (C)	27.0	30.1	26.5	**27.9**
5. UAS 304 (C)	28.9	28.6	31.8	**29.8**
Mean	**29.9**	**30.8**	**30.1**	**30.3**
Rainfed, Timely Sown				
1. UAS 375	36.0	44.4	32.6	**37.7**
2. NI 5439 (C)	34.0	41.5	33.0	**36.2**
3. NIAW 1415 (C)	38.8	40.9	38.2	**39.3**
Mean	**36.3**	**42.3**	**34.6**	**37.7**

Table 35:Wet Gluten (%) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	30.9	**30.9**
2. CoW (W) 1 (C)	32.7	**32.7**
3. HW 5216 (C)	32.4	**32.4**
4. UAS 387	34.8	**34.8**
Mean	**32.7**	**32.7**

Table 36: Dry Gluten (%) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	8.0	11.5	10.1	7.9	8.0	**9.1**
2. WH 1105 (C)	8.5	11.0	10.7	8.6	8.9	**9.5**
3. DBW 88 (C)	8.4	11.8	10.6	7.9	9.1	**9.6**
4. HD 3086 (C)	8.1	10.6	10.2	7.7	8.2	**9.0**
5. DBW 189	9.2	11.7	10.1	8.2	8.3	**9.5**
6. DBW 196	8.3	10.9	10.1	8.3	7.9	**9.1**
7. PBW 750	8.1	11.0	9.9	8.6	7.3	**9.0**
8. WH 1202	8.2	11.1	10.2	8.4	9.4	**9.5**
9. HD 3226	8.9	11.8	11.2	9.1	10.3	**10.3**
10. UP 2942	9.0	10.9	10.1	7.9	9.3	**9.4**
11. HP 1963	7.9	10.1	9.6	7.1	7.2	**8.4**
12. BRW 3773	8.4	10.3	10.2	8.4	10.4	**9.5**
Mean	**8.4**	**11.1**	**10.3**	**8.2**	**8.7**	**9.3**
Irrigated, Late Sown						
1. DBW 173	9.0	10.7	9.8	8.8	9.7	**9.6**
2. HD 3059 (C)	9.1	10.1	9.8	9.0	9.2	**9.4**
3. DBW 90 (C)	8.8	10.9	10.1	8.3	9.5	**9.5**
4. WH 1021 (C)	9.4	10.2	9.9	9.3	10.0	**9.8**
5. WH 1124 (C)	9.2	10.1	9.7	8.3	10.3	**9.5**
6. PBW 752	9.3	11.1	11.1	8.6	8.9	**9.8**
7. HI 1617	7.1	9.4	10.1	8.1	8.1	**8.6**
Mean	**8.8**	**10.4**	**10.1**	**8.6**	**9.4**	**9.5**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	9.9	-	9.7	8.8	7.9	**9.1**
2. PBW 644 (C)	10.9	-	8.1	9.4	7.1	**8.9**
3. HD 3043 (C)	10.4	-	11.7	8.1	8.7	**9.7**
4. WH 1142 (C)	9.4	-	10.9	7.7	7.6	**8.9**
5. HD 3237	9.9	-	8.2	8.1	7.3	**8.4**
6. HI 1619	9.3	-	9.3	7.2	7.0	**8.2**
7. HI 1620	10.3	-	9.4	9.0	8.9	**9.4**
8. CG 1023	10.1	-	10.2	9.9	7.9	**9.5**
9. MP 1318	10.4	-	9.0	8.4	8.8	**9.2**
10. MACS 6677	10.2	-	10.3	7.5	7.1	**8.8**
Mean	**10.1**	**-**	**9.7**	**8.4**	**7.8**	**9.0**

Table 37: Dry Gluten (%) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	7.9	10.4	9.7	**9.3**
2. K 0307 (C)	8.0	10.2	9.4	**9.2**
3. DBW 39 (C)	8.0	9.8	9.9	**9.2**
4. K 1006 (C)	6.9	9.5	9.4	**8.6**
5. HD 2967 (C)	8.0	11.5	10.5	**10.0**
6. DBW 187	7.2	10.2	10.1	**9.2**
7. HD 3219	7.9	9.8	10.3	**9.3**
Mean	**7.7**	**10.2**	**9.9**	**9.3**
Restricted Irrigation, Timely Sown				
1. HI 1612	9.4	8.6	6.8	**8.3**
2. HD2888 (C)	10.5	9.6	8.7	**9.6**
3. C 306 (C)	9.8	9.1	7.5	**8.8**
4. K 8027 (C)	10.0	8.8	8.0	**8.9**
5. HD 3171 (I)	9.8	7.8	8.3	**8.6**
6. K 1317 (I)	9.7	9.7	8.5	**9.3**
7. HI 1620	10.2	9.1	7.6	**9.0**
8. HS 611	10.1	8.9	10.3	**9.8**
9. UAS 384	9.7	9.0	7.1	**8.6**
Mean	**9.9**	**9.0**	**8.1**	**9.0**

Table 38: Dry Gluten (%) of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	8.2	8.6	11.9	10.8	**9.9**
2. DBW 110 (C)	7.5	6.7	11.8	10.6	**9.2**
3. BRW 3775	7.4	7.1	11.7	10.1	**9.1**
4. UAS 385	7.6	7.4	11.8	9.9	**9.2**
Mean	**7.7**	**7.5**	**11.8**	**10.4**	**9.3**

Table 39: Dry Gluten (%) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	10.2	10.1	10.4	**10.2**
2. MACS 6478 (C)	9.7	9.9	10.4	**10.0**
3. MACS 6222 (C)	10.2	10.5	10.5	**10.4**
4. GW 322 (C)	8.2	9.4	9.0	**8.9**
5. UAS 304 (C)	8.7	9.0	10.6	**9.4**
Mean	**9.4**	**9.8**	**10.2**	**9.8**
Rainfed, Timely Sown				
1. UAS 375	11.3	12.9	11.4	**11.9**
2. NI 5439 (C)	11.3	13.6	10.8	**11.9**
3. NIAW 1415 (C)	12.0	12.8	11.6	**12.1**
Mean	**11.5**	**13.1**	**11.3**	**12.0**

Table 40:Dry Gluten (%) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	9.7	**9.7**
2. CoW (W) 1 (C)	10.4	**10.4**
3. HW 5216 (C)	10.2	**10.2**
4. UAS 387	10.6	**10.6**
Mean	**10.2**	**10.2**

Table 41: Gluten Index (%) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	70	71	76	74	71	**72**
2. WH 1105 (C)	78	85	83	89	80	**83**
3. DBW 88 (C)	86	78	80	74	81	**80**
4. HD 3086 (C)	73	74	74	83	78	**76**
5. DBW 189	69	76	71	81	75	**74**
6. DBW 196	85	81	83	76	82	**81**
7. PBW 750	76	81	80	83	77	**79**
8. WH 1202	81	87	85	88	85	**85**
9. HD 3226	69	70	73	71	68	**70**
10. UP 2942	70	72	75	74	71	**72**
11. HP 1963	66	69	71	73	68	**69**
12. BRW 3773	81	77	83	71	83	**79**
Mean	**75**	**77**	**78**	**78**	**77**	**77**
Irrigated, Late Sown						
1. DBW 173	90	79	90	81	79	**84**
2. HD 3059 (C)	87	79	91	87	86	**86**
3. DBW 90 (C)	82	74	81	79	76	**78**
4. WH 1021 (C)	64	55	53	70	65	**61**
5. WH 1124 (C)	80	72	75	79	81	**77**
6. PBW 752	77	71	69	73	77	**73**
7. HI 1617	86	78	83	81	82	**82**
Mean	**81**	**73**	**77**	**79**	**78**	**77**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	83	-	87	85	82	**84**
2. PBW 644 (C)	58	-	63	57	68	**62**
3. HD 3043 (C)	58	-	61	70	59	**62**
4. WH 1142 (C)	75	-	67	65	71	**70**
5. HD 3237	61	-	63	73	62	**65**
6. HI 1619	69	-	71	77	64	**70**
7. HI 1620	71	-	73	79	69	**73**
8. CG 1023	59	-	56	61	63	**60**
9. MP 1318	64	-	67	69	59	**65**
10. MACS 6677	77	-	81	73	78	**77**
Mean	**68**	**-**	**69**	**71**	**68**	**69**

Table 42: Gluten Index (%) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	58	54	57	**56**
2. K 0307 (C)	54	45	50	**50**
3. DBW 39 (C)	57	56	60	**58**
4. K 1006 (C)	55	50	60	**55**
5. HD 2967 (C)	75	84	80	**80**
6. DBW 187	61	59	66	**62**
7. HD 3219	69	72	77	**73**
Mean	**61**	**60**	**64**	**62**
Restricted Irrigation, Timely Sown				
1. HI 1612	80	78	81	**80**
2. HD2888 (C)	50	55	62	**56**
3. C 306 (C)	55	63	61	**60**
4. K 8027 (C)	57	51	63	**57**
5. HD 3171 (I)	76	88	85	**83**
6. K 1317 (I)	70	64	73	**69**
7. HI 1620	79	82	74	**78**
8. HS 611	55	59	61	**58**
9. UAS 384	72	66	70	**69**
Mean	**66**	**67**	**70**	**68**

Table 43: Gluten Index (%)of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	75	71	80	70	**74**
2. DBW 110 (C)	76	80	72	71	**75**
3. BRW 3775	69	73	77	67	**72**
4. UAS 385	73	79	77	69	**75**
Mean	**73**	**76**	**77**	**69**	**74**

Table 44: Gluten Index (%) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	48	39	45	**44**
2. MACS 6478 (C)	51	50	54	**52**
3. MACS 6222 (C)	50	46	49	**48**
4. GW 322 (C)	43	46	52	**47**
5. UAS 304 (C)	46	51	45	**47**
Mean	**48**	**46**	**49**	**48**
Rainfed, Timely Sown				
1. UAS 375	58	55	70	**61**
2. NI 5439 (C)	72	66	68	**69**
3. NIAW 1415 (C)	63	53	52	**56**
Mean	**64**	**58**	**63**	**62**

Table 45:Gluten Index (%) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	64	**64**
2. CoW (W) 1 (C)	51	**51**
3. HW 5216 (C)	56	**56**
4. UAS 387	66	**66**
Mean	**59**	**59**

Biscuit Quality (Table 46-55)

More than Two hundred fifty samples of AVT (1st and 2nd year) and checks representing different locations were evaluated for biscuit making quality. The samples represented 5 zones except NHZ and all the conditions as ITS, ILS, RILS and RTS. Baking test was conducted from pooled samples of all the replications of an entry and two parameters namely biscuit diameter and spread factor were recorded. The flour was extracted from all the entries using Quadrumet Senior Mill with the average extraction rate of ~70 %.

Surprisingly there was no entry in all the zones having desirable spread factor (>10.0) for identification. This year there was no entry evaluated representing NHZ where we have one variety (HS 490) with more than 11.0 spread factor. HS 611 showed comparatively higher spread factor (8.13) under RITS conditions of NEPZ followed by DBW 168 (7.87). This clearly demonstrates that there is need to have strong breeding programme for soft wheat products in the country.

Pasta Quality (Table 56-57)

Pasta product (macaroni) was prepared from all the AVT entries including checks. Semolina was extracted and purified from all the centres in ITS condition of CZ and also RITS& RTS conditions of CZ &PZ. The semolina samples of all the respective centres of each zone and sowing condition were mixed and macaroni was prepared from the composite samples. For the evaluation of macaroni cooking quality (Table 45), various parameters like cooking time, water absorption, water uptake ratio, gruel solid loss and stickiness were considered. Apart from these, sensory evaluation (Table 46) was carried out where parameters like colour, texture, flavor, taste and based on these, overall acceptability using ‘9’ point hedonic scale was considered.

Table 46: Biscuit Diameter (cm) of *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	7.10	7.21	7.47	7.13	7.23	**7.23**
2. WH 1105 (C)	7.16	7.02	6.59	7.57	7.08	**7.08**
3. DBW 88 (C)	7.33	7.16	7.09	7.49	7.27	**7.27**
4. HD 3086 (C)	7.24	6.74	7.10	7.27	7.09	**7.09**
5. DBW 189	7.38	7.13	7.50	7.52	7.38	**7.38**
6. DBW 196	7.19	6.92	7.31	7.43	7.21	**7.21**
7. PBW 750	7.22	6.78	7.05	7.32	7.09	**7.09**
8. WH 1202	7.18	6.79	7.39	7.50	7.21	**7.21**
9. HD 3226	7.42	7.34	7.50	7.66	7.48	**7.48**
10. UP 2942	7.05	7.29	7.19	7.06	7.15	**7.15**
11. HP 1963	7.41	6.88	7.27	7.39	7.23	**7.24**
12. BRW 3773	7.01	6.97	7.42	6.92	7.08	**7.08**
Mean	**7.22**	**7.02**	**7.24**	**7.36**	**7.21**	**7.21**
Irrigated, Late Sown						
1. DBW 173	7.29	7.29	7.23	7.35	7.29	**7.29**
2. HD 3059 (C)	7.34	7.27	7.36	7.57	7.39	**7.39**
3. DBW 90 (C)	7.17	6.99	7.42	7.43	7.25	**7.25**
4. WH 1021 (C)	7.48	7.50	7.53	7.64	7.54	**7.54**
5. WH 1124 (C)	7.12	6.80	7.25	7.55	7.18	**7.18**
6. PBW 752	7.48	7.11	7.24	7.33	7.29	**7.29**
7. HI 1617	7.52	7.05	7.09	7.47	7.28	**7.28**
Mean	**7.34**	**7.14**	**7.30**	**7.48**	**7.32**	**7.32**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	7.33	-	7.33	7.80	7.49	**7.49**
2. PBW 644 (C)	7.00	-	7.36	7.25	7.21	**7.21**
3. HD 3043 (C)	7.08	-	7.32	7.56	7.32	**7.32**
4. WH 1142 (C)	7.43	-	7.29	7.80	7.51	**7.51**
5. HD 3237	7.11	-	7.43	7.46	7.33	**7.33**
6. HI 1619	6.99	-	7.61	7.70	7.43	**7.43**
7. HI 1620	7.06	-	7.00	7.19	7.08	**7.08**
8. CG 1023	7.16	-	7.25	7.11	7.17	**7.17**
9. MP 1318	7.15	-	7.34	7.10	7.20	**7.20**
10. MACS 6677	7.18	-	6.97	7.42	7.19	**7.19**
Mean	**7.15**	**-**	**7.29**	**7.44**	**7.29**	**7.29**

Table 47: Biscuit Diameter (cm) of *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	7.43	7.12	7.52	**7.36**
2. K 0307 (C)	7.08	7.35	7.42	**7.28**
3. DBW 39 (C)	7.60	7.45	7.42	**7.49**
4. K 1006 (C)	7.52	7.40	7.00	**7.31**
5. HD 2967 (C)	7.51	7.35	7.33	**7.40**
6. DBW 187	7.36	7.21	7.50	**7.36**
7. HD 3219	7.67	7.53	7.39	**7.53**
Mean	**7.45**	**7.34**	**7.37**	**7.39**
Restricted Irrigation, Timely Sown				
1. HI 1612	7.40	7.39	7.75	**7.51**
2. HD2888 (C)	7.35	7.80	7.34	**7.50**
3. C 306 (C)	7.03	7.17	7.19	**7.13**
4. K 8027 (C)	7.16	7.15	7.19	**7.17**
5. HD 3171 (I)	7.16	7.33	7.03	**7.17**
6. K 1317 (I)	7.63	7.44	7.10	**7.39**
7. HI 1620	7.45	7.40	7.50	**7.45**
8. HS 611	7.84	7.99	7.74	**7.86**
9. UAS 384	7.54	7.71	7.53	**7.59**
Mean	**7.40**	**7.49**	**7.37**	**7.42**

Table 48: Biscuit Diameter (cm) of *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	6.87	7.04	6.75	6.99	**6.91**
2. DBW 110 (C)	7.36	7.49	7.26	7.28	**7.35**
3. BRW 3775	7.36	7.59	6.96	7.50	**7.35**
4. UAS 385	7.11	7.52	7.08	6.92	**7.16**
Mean	**7.18**	**7.41**	**7.01**	**7.17**	**7.19**

Table 49: Biscuit Diameter (cm) of *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	7.91	7.99	7.74	**7.88**
2. MACS 6478 (C)	7.45	7.43	7.16	**7.35**
3. MACS 6222 (C)	7.26	7.43	7.41	**7.37**
4. GW 322 (C)	7.45	7.45	7.41	**7.44**
5. UAS 304 (C)	7.33	7.46	7.29	**7.36**
Mean	**7.48**	**7.55**	**7.40**	**7.48**
Rainfed, Timely Sown				
1. UAS 375	7.29	6.90	7.07	**7.09**
2. NI 5439 (C)	6.81	6.89	6.02	**6.57**
3. NIAW 1415 (C)	7.13	7.13	5.76	**6.67**
Mean	**7.08**	**6.97**	**6.28**	**6.78**

Table 50:Biscuit Diameter (cm) of *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	7.50	**7.50**
2. CoW (W) 1 (C)	7.45	**7.45**
3. HW 5216 (C)	7.26	**7.26**
4. UAS 387	7.57	**7.57**
Mean	**7.45**	**7.45**

Table 51: Biscuit Speard Factorof *T.aestivum*genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	6.80	6.42	6.88	6.07	7.21	**6.68**
2. WH 1105 (C)	6.85	5.76	5.84	7.69	6.95	**6.62**
3. DBW 88 (C)	7.07	6.28	6.12	7.25	6.50	**6.64**
4. HD 3086 (C)	6.57	4.87	6.24	6.94	6.47	**6.22**
5. DBW 189	7.01	5.89	6.87	7.50	6.82	**6.82**
6. DBW 196	6.66	5.16	6.29	7.04	5.67	**6.16**
7. PBW 750	6.73	3.95	6.11	6.46	7.25	**6.10**
8. WH 1202	6.76	5.49	6.93	6.98	6.83	**6.60**
9. HD 3226	6.98	6.29	7.09	7.75	6.84	**6.99**
10. UP 2942	6.71	6.41	6.39	5.65	6.75	**6.38**
11. HP 1963	0.15	5.00	6.86	7.44	7.22	**5.33**
12. BRW 3773	6.29	5.89	7.21	5.20	6.67	**6.25**
Mean	**6.22**	**5.62**	**6.57**	**6.83**	**6.77**	**6.40**
Irrigated, Late Sown						
1. DBW 173	6.96	6.48	6.64	6.93	8.35	**7.07**
2. HD 3059 (C)	7.85	6.61	6.90	6.93	7.69	**7.20**
3. DBW 90 (C)	6.53	5.63	6.83	6.89	6.15	**6.41**
4. WH 1021 (C)	7.52	7.07	7.33	7.53	7.30	**7.35**
5. WH 1124 (C)	6.46	5.03	6.46	7.57	6.62	**6.43**
6. PBW 752	7.42	6.06	6.39	6.41	7.10	**6.68**
7. HI 1617	7.83	5.73	6.40	6.54	6.19	**6.54**
Mean	**7.22**	**6.09**	**6.71**	**6.97**	**7.06**	**6.81**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	7.01	-	6.60	7.64	5.68	**6.73**
2. PBW 644 (C)	5.60	-	7.06	6.36	5.84	**6.22**
3. HD 3043 (C)	6.05	-	6.31	6.98	5.61	**6.24**
4. WH 1142 (C)	7.19	-	6.66	7.76	5.88	**6.87**
5. HD 3237	6.33	-	7.12	6.40	5.58	**6.36**
6. HI 1619	6.40	-	5.65	7.58	6.01	**6.41**
7. HI 1620	6.03	-	5.93	6.07	5.22	**5.81**
8. CG 1023	5.94	-	6.67	5.84	4.81	**5.82**
9. MP 1318	6.28	-	6.86	5.61	5.51	**6.07**
10. MACS 6677	6.23	-	5.75	6.48	5.72	**6.05**
Mean	**6.31**	**-**	**6.46**	**6.67**	**5.59**	**6.26**

Table 52: Biscuit Speard Factorof *T.aestivum*genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	6.91	5.72	7.19	**6.61**
2. K 0307 (C)	5.88	6.63	7.40	**6.64**
3. DBW 39 (C)	7.51	6.66	7.19	**7.12**
4. K 1006 (C)	7.39	6.82	5.81	**6.67**
5. HD 2967 (C)	7.55	7.06	6.57	**7.06**
6. DBW 187	6.86	6.62	6.99	**6.82**
7. HD 3219	7.59	7.35	7.11	**7.35**
Mean	**7.10**	**6.69**	**6.89**	**6.90**
Restricted Irrigation, Timely Sown				
1. HI 1612	7.57	7.04	7.56	**7.39**
2. HD2888 (C)	5.54	8.12	6.60	**6.75**
3. C 306 (C)	5.76	6.09	6.64	**6.16**
4. K 8027 (C)	5.86	6.14	6.43	**6.14**
5. HD 3171 (I)	5.58	6.86	5.27	**5.90**
6. K 1317 (I)	7.32	6.80	5.86	**6.66**
7. HI 1620	7.06	6.09	7.21	**6.79**
8. HS 611	8.09	8.16	8.14	**8.13**
9. UAS 384	7.67	7.96	7.24	**7.62**
Mean	**6.72**	**7.03**	**6.77**	**6.84**

Table 53: Biscuit Speard Factorof *T.aestivum*genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	5.74	5.36	5.30	5.63	**5.51**
2. DBW 110 (C)	6.80	7.21	6.69	6.46	**6.79**
3. BRW 3775	7.00	7.92	5.98	7.28	**7.05**
4. UAS 385	6.04	7.19	6.54	5.43	**6.30**
Mean	**6.40**	**6.92**	**6.13**	**6.20**	**6.41**

Table 54: Biscuit Speard Factorof *T.aestivum*genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	7.93	8.26	7.43	**7.87**
2. MACS 6478 (C)	7.06	6.85	5.91	**6.61**
3. MACS 6222 (C)	6.65	7.04	7.06	**6.92**
4. GW 322 (C)	7.42	7.11	7.02	**7.18**
5. UAS 304 (C)	7.00	7.19	6.34	**6.84**
Mean	**7.21**	**7.29**	**6.75**	**7.08**
Rainfed, Timely Sown				
1. UAS 375	6.64	5.24	5.69	**5.86**
2. NI 5439 (C)	5.15	5.32	5.23	**5.23**
3. NIAW 1415 (C)	6.84	5.88	4.64	**5.79**
Mean	**6.21**	**5.48**	**5.19**	**5.63**

Table 55:Biscuit Speard Factorof *T.aestivum*genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	6.86	**6.86**
2. CoW (W) 1 (C)	6.74	**6.74**
3. HW 5216 (C)	6.47	**6.47**
4. UAS 387	7.28	**7.28**
Mean	**6.84**	**6.84**

Table 56:Pasta Cooking Qualityof *T. durum*genotypes in AVT's

Variety	Cooking Time (Min.:Sec.)	Water Absorption (%)	Water Utake Ratio	Gruel Solid Loss (%)	Stickness
RITS (CZ)					
1. HI 8627 (C)	11:45	123	1.23	1.49	NS
2. UAS 462	12:40	114	1.14	2.03	PS
3. HI 8791	12:30	117	1.17	1.87	S
RTS (PZ)					
1. HI 8777	12:05	122	1.22	1.63	PS
2. MACS 4028	12:15	119	1.19	1.75	S
3. UAS 446 (C)	11:35	127	1.27	1.37	PS
4. AKDW2997-16 (C)	12:50	112	1.12	2.47	S

Table 57:Pasta Sensory Evaluationof *T. durum*genotypes in AVT's

Variety	Colour	Texure	Flavour/ Aroma	Taste	Overall Acceptability	Rank
RITS (CZ)						
1. HI8627(C)	8	7	7	7	7.25	2
2. UAS 462	6	6	6	6	6.00	6
3. HI 8791	6	7	6	7	6.50	5
RTS (PZ)						
1. HI 8777	7	7	7	7	7.00	3
2. MACS 4028	7	6	7	7	6.75	4
3. UAS 446 (C)	7	7	8	8	7.50	1
4. AKDW2997-16 (C)	5	6	6	6	5.75	7

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AICRP on Wheat & Barley

PROGRESS REPORT
2016-17

WHEAT QUALITY

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SECTION F

GRAIN NUTRITION

i. **Protein**

ii. **Yellow Pigment**

iii. **Iron**

iv. **Zinc**

NUTRITIONAL QUALITY

All entries and the checks included in AVT's were anlysed for certain grain nutrition attributes like protein, iron, zinc and yellow pigment contents. Mean across the locations (zone mean) was accounted to differentiate between the genotypes whereas overall trial mean was considered to demarcate the test sites.The protein content (on 14 % moisture basis)

was determined by NIT protein analyser (Foss Tecator), yellow pigment content by AACC colourimetric method and iron & zinc content by XRF (X-ray flouresence) instrument.

(A) Bread wheat

All the *T. aestivum* entries including checks were analysed for nutritional parameters like protein content (mentioned in the 1st chapter on *T. aestivum* in table 6-10), yellow pigment content (Table 1-5). iron content (6-10) and zinc content (table 11-15).

(B) Durum wheat

All the *T. durum* entries including checks were analysed for nutritional parameters like protein content (mentioned in the 1st chapter on *T. durum* in table 41-42), yellow pigment content (mentioned in the 1st chapter on *T. durum* in table 48-49). iron content (16-17) and zinc content (table 18-19).

Table 1: Yellow Pigment Content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	3.56	3.24	3.56	3.14	3.52	**3.40**
2. WH 1105 (C)	3.34	2.76	3.39	3.39	2.62	**3.10**
3. DBW 88 (C)	2.65	2.65	3.13	2.46	3.34	**2.85**
4. HD 3086 (C)	3.03	2.96	3.15	2.94	3.03	**3.02**
5. DBW 189	2.86	2.93	3.21	2.65	3.12	**2.95**
6. DBW 196	2.67	3.26	2.58	2.39	3.00	**2.78**
7. PBW 750	1.85	1.96	2.12	1.89	2.20	**2.00**
8. WH 1202	2.20	1.94	2.01	2.31	2.22	**2.14**
9. HD 3226	2.32	2.29	2.22	2.34	2.41	**2.32**
10. UP 2942	2.86	2.67	2.93	2.83	3.09	**2.88**
11. HP 1963	2.81	2.98	2.83	3.05	3.37	**3.01**
12. BRW 3773	2.27	2.01	2.32	2.27	2.43	**2.26**
Mean	**2.70**	**2.64**	**2.79**	**2.64**	**2.86**	**2.73**
Irrigated, Late Sown						
1. DBW 173	2.60	2.72	2.60	2.81	2.53	**2.65**
2. HD 3059 (C)	3.36	3.00	3.28	2.84	2.81	**3.06**
3. DBW 90 (C)	2.22	2.20	2.20	1.89	2.08	**2.12**
4. WH 1021 (C)	2.69	3.00	2.81	2.90	2.88	**2.86**
5. WH 1124 (C)	2.74	2.66	2.78	2.72	2.88	**2.76**
6. PBW 752	3.12	3.31	2.65	2.88	2.74	**2.94**
7. HI 1617	2.74	2.48	3.00	2.60	2.70	**2.70**
Mean	**2.78**	**2.77**	**2.76**	**2.66**	**2.66**	**2.73**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	3.18	-	3.45	2.99	3.01	**3.16**
2. PBW 644 (C)	3.06	-	3.29	3.08	3.01	**3.11**
3. HD 3043 (C)	3.99	-	3.45	3.28	3.65	**3.59**
4. WH 1142 (C)	2.65	-	2.88	2.76	2.58	**2.72**
5. HD 3237	2.46	-	2.20	2.43	2.60	**2.42**
6. HI 1619	2.43	-	2.60	2.22	2.46	**2.43**
7. HI 1620	2.27	-	2.65	2.36	2.41	**2.42**
8. CG 1023	2.01	-	1.99	2.16	1.93	**2.02**
9. MP 1318	3.73	-	3.11	3.45	3.32	**3.40**
10. MACS 6677	2.08	-	2.43	2.01	2.16	**2.17**
Mean	**2.79**	**-**	**2.81**	**2.67**	**2.71**	**2.74**

Table 2: Yellow Pigment Content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	2.67	2.91	2.87	**2.82**
2. K 0307 (C)	2.68	2.34	2.59	**2.54**
3. DBW 39 (C)	3.07	3.35	3.00	**3.14**
4. K 1006 (C)	2.06	2.22	1.94	**2.07**
5. HD 2967 (C)	2.86	3.78	2.51	**3.05**
6. DBW 187	1.83	2.18	1.94	**1.98**
7. HD 3219	2.48	2.83	2.27	**2.53**
Mean	**2.52**	**2.80**	**2.45**	**2.59**
Restricted Irrigation, Timely Sown				
1. HI 1612	2.56	2.78	2.47	**2.60**
2. HD2888 (C)	3.76	3.69	3.83	**3.76**
3. C 306 (C)	3.46	3.69	3.57	**3.57**
4. K 8027 (C)	3.91	3.98	3.74	**3.88**
5. HD 3171 (I)	4.13	2.74	3.82	**3.56**
6. K 1317 (I)	3.79	4.09	4.12	**4.00**
7. HI 1620	3.01	2.82	3.01	**2.95**
8. HS 611	2.61	3.08	2.81	**2.83**
9. UAS 384	2.43	2.56	2.66	**2.55**
Mean	**3.30**	**3.27**	**3.34**	**3.30**

Table 3: Yellow Pigment Content (ppm) of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	2.69	3.02	2.48	2.67	**2.72**
2. DBW 110 (C)	1.93	2.29	2.36	2.06	**2.16**
3. BRW 3775	2.03	2.31	2.27	2.41	**2.26**
4. UAS 385	2.79	3.05	3.15	2.79	**2.95**
Mean	**2.36**	**2.67**	**2.57**	**2.48**	**2.52**

Table 4: Yellow Pigment Content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Code	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown					
1. DBW 168		3.71	3.47	3.35	3.71
2. MACS 6478 (C)		3.19	3.35	3.00	3.19
3. MACS 6222 (C)		3.12	3.26	2.93	3.12
4. GW 322 (C)		2.67	2.48	2.75	2.67
5. UAS 304 (C)		4.19	3.73	3.80	4.19
Mean		**3.38**	**3.26**	**3.17**	**3.38**
Rainfed, Timely Sown					
1. UAS 375		3.35	3.33	3.54	3.35
2. NI 5439 (C)		3.52	3.73	3.73	3.52
3. NIAW 1415 (C)		3.31	3.45	3.73	3.31
Mean		**3.39**	**3.50**	**3.67**	**3.39**

Table 5 : Yellow Pigment Content (ppm) of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	3.64	**3.64**
2. CoW (W) 1 (C)	3.54	**3.54**
3. HW 5216 (C)	3.28	**3.28**
4. UAS 387	4.13	**4.13**
Mean	**3.65**	**3.65**

Table 6: Iron Content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	34.9	38.6	37.5	35.4	33.9	**36.1**
2. WH 1105 (C)	37.0	35.9	44.8	39.4	35.7	**38.6**
3. DBW 88 (C)	36.3	35.4	42.6	44.5	40.0	**39.8**
4. HD 3086 (C)	35.1	36.5	45.4	39.3	41.2	**39.5**
5. DBW 189	34.9	39.8	41.9	34.8	35.4	**37.4**
6. DBW 196	33.5	37.9	44.9	34.9	36.0	**37.4**
7. PBW 750	34.1	40.0	38.7	39.6	33.2	**37.1**
8. WH 1202	36.4	38.7	44.1	40.8	38.7	**39.7**
9. HD 3226	37.7	36.5	44.1	38.1	36.8	**38.6**
10. UP 2942	35.1	37.6	45.1	38.4	36.2	**38.5**
11. HP 1963	31.8	35.3	48.3	34.5	31.1	**36.2**
12. BRW 3773	35.1	36.0	42.9	37.3	42.8	**38.8**
Mean	**35.2**	**37.4**	**43.4**	**38.1**	**36.8**	**38.1**
Irrigated, Late Sown						
1. DBW 173	40.6	44.8	39.3	44.2	34.7	**40.7**
2. HD 3059 (C)	34.9	39.3	42.6	41.8	35.1	**38.7**
3. DBW 90 (C)	38.4	43.2	47.1	44.3	35.4	**41.7**
4. WH 1021 (C)	34.1	39.9	38.7	40.6	32.8	**37.2**
5. WH 1124 (C)	36.3	42.3	44.8	47.5	34.2	**41.0**
6. PBW 752	37.5	41.0	46.9	45.7	42.5	**42.7**
7. HI 1617	30.8	41.0	39.8	43.7	35.7	**38.2**
Mean	**36.1**	**41.6**	**42.7**	**44.0**	**35.8**	**40.0**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	32.9	-	36.9	35.4	36.8	**35.5**
2. PBW 644 (C)	37.8	-	39.1	36.8	36.6	**37.6**
3. HD 3043 (C)	36.6	-	40.4	36.8	34.7	**37.1**
4. WH 1142 (C)	39.2	-	41.6	33.3	35.6	**37.4**
5. HD 3237	40.3	-	38.0	36.3	40.3	**38.7**
6. HI 1619	39.4	-	43.9	34.7	37.5	**38.9**
7. HI 1620	39.0	-	45.4	40.2	39.0	**40.9**
8. CG 1023	35.7	-	41.7	39.6	36.7	**38.4**
9. MP 1318	39.4	-	38.0	37.7	37.2	**38.1**
10. MACS 6677	36.9	-	35.1	31.3	34.4	**34.4**
Mean	**37.7**	**-**	**40.0**	**36.2**	**36.9**	**37.7**

Table 7: Iron Content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	35.7	35.9	36.4	**36.0**
2. K 0307 (C)	39.5	40.7	38.6	**39.6**
3. DBW 39 (C)	38.0	39.6	35.8	**37.8**
4. K 1006 (C)	40.6	40.2	35.0	**38.6**
5. HD 2967 (C)	37.2	38.9	34.6	**36.9**
6. DBW 187	35.6	47.6	48.2	**43.8**
7. HD 3219	39.7	36.4	34.1	**36.7**
Mean	**38.0**	**39.9**	**37.5**	**38.5**
Restricted Irrigation, Timely Sown				
1. HI 1612	43.4	38.5	42.6	**41.5**
2. HD2888 (C)	46.3	43.8	46.1	**45.4**
3. C 306 (C)	45.2	41.5	48.2	**45.0**
4. K 8027 (C)	42.0	43.1	39.2	**41.4**
5. HD 3171 (I)	41.0	44.7	44.2	**43.3**
6. K 1317 (I)	40.9	36.1	39.9	**39.0**
7. HI 1620	41.5	39.1	42.7	**41.1**
8. HS 611	41.3	48.3	38.5	**42.7**
9. UAS 384	40.0	43.5	37.9	**40.5**
Mean	**42.4**	**42.1**	**42.1**	**42.2**

Table 8: Iron Content (ppm) of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	38.6	36.3	40.7	35.1	**37.7**
2. DBW 110 (C)	41.5	37.0	42.8	36.1	**39.4**
3. BRW 3775	36.9	37.4	41.3	35.1	**37.7**
4. UAS 385	39.7	41.9	42.7	40.4	**41.2**
Mean	**39.2**	**38.2**	**41.9**	**36.7**	**39.0**

Table 9: Iron Content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	34.9	42.6	38.5	**38.7**
2. MACS 6478 (C)	32.4	38.5	36.7	**35.9**
3. MACS 6222 (C)	36.4	42.5	38.0	**39.0**
4. GW 322 (C)	35.7	37.0	32.4	**35.0**
5. UAS 304 (C)	32.5	38.9	36.6	**36.0**
Mean	**34.4**	**39.9**	**36.4**	**36.9**
Rainfed, Timely Sown				
1. UAS 375	45.2	41.6	44.1	**43.6**
2. NI 5439 (C)	46.6	46.7	49.4	**47.6**
3. NIAW 1415 (C)	49.7	46.9	46.7	**47.8**
Mean	**47.2**	**45.1**	**46.7**	**46.3**

Table 10: Iron Content (ppm)) of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	48.9	**48.9**
2. CoW (W) 1 (C)	57.1	**57.1**
3. HW 5216 (C)	53.7	**53.7**
4. UAS 387	58.9	**58.9**
Mean	**54.7**	**54.7**

Table 11: Zinc Content (ppm) of *T.aestivum* genotypes in North Western Plains Zone AVT's

Variety	Ludhiana	Durgapura	Delhi	Pantnagar	Hisar	Mean
Irrigated, Timely Sown						
1. HD 2967 (C)	33.1	42.4	41.0	23.4	38.2	**35.6**
2. WH 1105 (C)	32.2	47.4	47.5	24.8	47.5	**39.9**
3. DBW 88 (C)	28.4	45.2	34.9	26.9	44.0	**35.9**
4. HD 3086 (C)	30.2	43.4	40.9	21.8	43.6	**36.0**
5. DBW 189	27.1	45.6	40.8	23.7	36.9	**34.8**
6. DBW 196	30.1	49.5	45.7	24.7	48.6	**39.7**
7. PBW 750	30.6	41.0	38.9	25.0	35.0	**34.1**
8. WH 1202	27.6	47.6	41.5	24.7	36.4	**35.6**
9. HD 3226	28.0	49.1	41.5	23.9	42.8	**37.1**
10. UP 2942	32.7	47.3	44.4	28.5	48.0	**40.2**
11. HP 1963	23.8	44.4	43.2	22.1	34.9	**33.7**
12. BRW 3773	29.7	44.4	38.6	24.8	49.9	**37.5**
Mean	**29.5**	**45.6**	**41.6**	**24.5**	**42.2**	**36.7**
Irrigated, Late Sown						
1. DBW 173	23.3	37.1	45.1	21.8	38.4	**33.1**
2. HD 3059 (C)	32.6	36.7	40.1	20.3	44.3	**34.8**
3. DBW 90 (C)	37.0	40.7	45.6	17.5	38.5	**35.9**
4. WH 1021 (C)	41.0	41.9	44.2	21.6	40.2	**37.8**
5. WH 1124 (C)	29.6	36.5	41.8	20.6	33.6	**32.4**
6. PBW 752	29.3	43.3	48.7	23.4	42.6	**37.5**
7. HI 1617	21.9	33.0	40.9	18.9	39.8	**30.9**
Mean	**30.7**	**38.5**	**43.8**	**20.6**	**39.6**	**34.6**
Restricted Irrigation, Timely Sown						
1. WH 1080 (C)	29.8	-	35.2	31.4	31.5	**32.0**
2. PBW 644 (C)	33.4	-	39.9	36.0	36.8	**36.5**
3. HD 3043 (C)	32.2	-	42.8	44.3	44.6	**41.0**
4. WH 1142 (C)	30.1	-	46.5	33.9	27.3	**34.5**
5. HD 3237	38.4	-	42.7	43.0	40.0	**41.0**
6. HI 1619	26.8	-	45.0	35.1	32.2	**34.8**
7. HI 1620	28.1	-	41.7	37.4	37.8	**36.3**
8. CG 1023	27.7	-	45.6	45.8	42.3	**40.4**
9. MP 1318	28.4	-	39.7	35.4	40.2	**35.9**
10. MACS 6677	30.9	-	43.8	30.7	39.5	**36.2**
Mean	**30.6**	**-**	**42.3**	**37.3**	**37.2**	**36.8**

Table 12: Zinc Content (ppm) of *T.aestivum* genotypes in North Eastern Plains Zone AVT's

Variety	Kanpur	Pusa	Sabour	Mean
Irrigated, Timely Sown				
1. HD 2733 (C)	32.9	35.9	25.2	**31.3**
2. K 0307 (C)	36.7	34.6	26.4	**32.6**
3. DBW 39 (C)	40.2	36.0	25.7	**34.0**
4. K 1006 (C)	41.5	34.2	21.8	**32.5**
5. HD 2967 (C)	40.4	42.0	28.1	**36.8**
6. DBW 187	30.5	30.0	22.0	**27.5**
7. HD 3219	37.5	32.3	25.5	**31.8**
Mean	**37.1**	**35.0**	**25.0**	**32.4**
Restricted Irrigation, Timely Sown				
1. HI 1612	41.9	35.4	29.1	**35.5**
2. HD2888 (C)	43.4	45.4	36.5	**41.8**
3. C 306 (C)	41.9	46.0	32.1	**40.0**
4. K 8027 (C)	45.3	39.8	32.4	**39.2**
5. HD 3171 (I)	37.4	36.7	31.3	**35.1**
6. K 1317 (I)	38.3	35.1	32.6	**35.3**
7. HI 1620	32.3	33.7	29.2	**31.7**
8. HS 611	34.5	45.2	32.2	**37.3**
9. UAS 384	39.5	43.9	31.1	**38.2**
Mean	**39.4**	**40.1**	**31.8**	**37.1**

Table 13: Zinc Content (ppm) of *T.aestivum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. MP 3288 (C)	47.2	26.4	42.3	37.5	**38.4**
2. DBW 110 (C)	47.2	26.2	38.2	41.2	**38.2**
3. BRW 3775	41.7	27.7	38.9	44.3	**38.2**
4. UAS 385	47.1	30.9	41.1	44.7	**41.0**
Mean	**45.8**	**27.8**	**40.1**	**41.9**	**38.9**

Table 14: Zinc Content (ppm) of *T.aestivum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Irrigated, Timely Sown				
1. DBW 168	36.1	28.9	33.0	**32.7**
2. MACS 6478 (C)	38.4	34.0	34.6	**35.7**
3. MACS 6222 (C)	36.1	31.6	31.6	**33.1**
4. GW 322 (C)	40.4	26.4	28.8	**31.9**
5. UAS 304 (C)	38.5	34.1	36.7	**36.4**
Mean	**37.9**	**31.0**	**32.9**	**33.9**
Rainfed, Timely Sown				
1. UAS 375	24.8	41.6	30.0	**32.1**
2. NI 5439 (C)	25.3	42.9	28.6	**32.3**
3. NIAW 1415 (C)	26.9	45.2	27.8	**33.3**
Mean	**25.7**	**43.2**	**28.8**	**32.6**

Table 15: Zinc Content (ppm) of *T.aestivum* genotypes in Southern Hill Zone AVT's

Variety	Wellington (TS)	Mean
Restricted Irrigation,Timely Sown		
1. HW 2044 (C)	38.8	**38.8**
2. CoW (W) 1 (C)	47.7	**47.7**
3. HW 5216 (C)	50.3	**50.3**
4. UAS 387	50.1	**50.1**
Mean	**46.7**	**46.7**

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

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	38.9	37.1	44.5	37.0	**39.4**
2. UAS 462	39.6	38.6	44.7	40.0	**40.7**
3. HI 8791	39.5	36.7	44.1	38.2	**39.6**
Mean	**39.3**	**37.5**	**44.4**	**38.4**	**39.9**

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

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	47.0	48.7	50.5	**48.7**
2. MACS 4028	43.8	44.9	49.5	**46.1**
3. UAS 446 (C)	43.0	42.2	48.2	**44.5**
4. AKDW2997-16 (C)	49.6	40.2	43.7	**44.5**
Mean	**45.9**	**44.0**	**48.0**	**45.9**

Table 18: Zinc Content (ppm) of *T. durum* genotypes in Central Zone AVT's

Variety	Indore	Kota	Junagarh	Vijapur	Mean
Restricted Irrigation, Timely Sown					
1. HI 8627 (C)	45.3	27.0	47.0	46.3	**41.4**
2. UAS 462	50.6	29.9	40.1	54.8	**43.9**
3. HI 8791	49.8	29.7	49.3	46.9	**43.9**
Mean	**48.6**	**28.9**	**45.5**	**49.3**	**43.1**

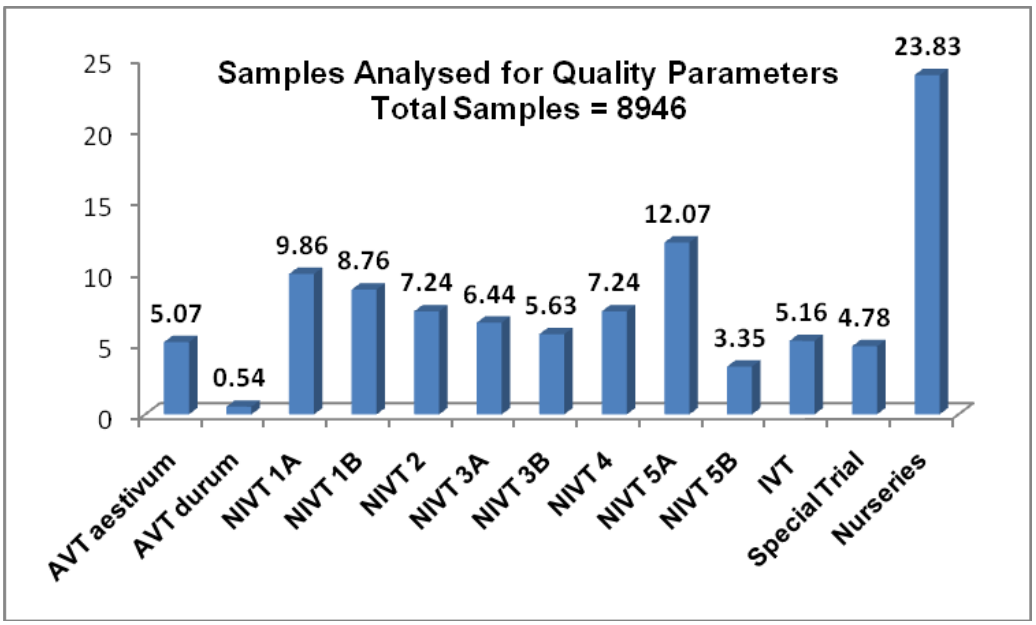
Tabl 19: Zinc Content (ppm) of *T. durum* genotypes in Peninsular Zone AVT's

Variety	Pune	Dharwad	Niphad	Mean
Rainfed, Timely Sown				
1. HI 8777	40.1	49.0	41.6	**43.6**
2. MACS 4028	32.6	47.4	40.9	**40.3**
3. UAS 446 (C)	33.3	50.8	38.7	**40.9**
4. AKDW2997-16 (C)	31.1	47.7	28.1	**35.6**
Mean	**34.3**	**48.7**	**37.3**	**40.1**

RESEARCH HIGHLIGHTS

RESEARCH HIGHLIGHTS

The wheat production in India is estimated to be 97.44 million tons from 30.71 million hectares area at productivity level of 3.172 tons/ha during 2016-17 (third estimate). This could be made possible by developing high yielding, disease resistant wheat varieties and also matching production technologies. The increase in domestic demand of baked & pasta products and economic liberalization & global trade have offered opportunities for better utilization of wheat. Wheat quality needs uppermost attention to meet the trade requirements of the domestic and international markets. The report includes aspects like identification of product specific genotypes. Promising genotypes showing superiority in various quality traits including grain nutrition parameters have been identified. Zone wise variability in wheat quality and grain nutrition parameters has been recorded. During 2016-17, Eight thousand nine hundred forty six (8946) AICW & BIP wheat grain samples belonging to AVTs, NIVTS, IVTs, Special Trials and Nurseries were analysed.



AVT's:

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

Product specific genotypes were identified from AVT trials. Only those genotypes were selected for chapati, which scored > 8.0 score out 10.0. Genotypes with > 575 ml loaf volumes were selected for bread. For pasta products (macaroni), genotypes were selected scoring > 7.0 point on the hedonic scale of '9' and after considering cooking and other quality parameters.

Promising *T.aestivum* Genotypes for Chapati

Category	Genotypes
Check	DBW 39, HD 2888, C 306, K 8027, K 1317, MACS 6478, NIAW 1415
2nd year AVT	DBW 168
1st year AVT	DBW 196, UP 2942, CG 1023, MP 1318, UAS 384

Promising *T.aestivum* Genotypes for Bread

Category	Genotypes
Check	MACS 6478, MACS 6222, NI 5439, NIAW 1415
2nd year AVT	UAS 375

The spread factor was calculated by dividing the diameter of the biscuit with its thickness. The entry HS 611 showed comparatively higher spread factor (8.13) followed by DBW 168 (7.87).

Promising *T.durum* Genotypes for Pasta Products (Macroni)

Category	Genotypes
Check	HI 8627, UAS 446
2nd year AVT	HI 8777

Genotypes recording >71.0% extraction rate were also identified.

Promising *T.aestivum* Genotypes for Extraction Rate

Category	Genotypes
Check	HD 3043, HD 2733, K 0307, K 1006, HD 2967, HD 2888, C 306, K 8027, MACS 6222, GW 322, NI 5439, NIAW 1415, HW 2044
2nd year AVT	HI 1612
1st year AVT	UAS 385, UAS 375

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

Promising Genotypes for Various Quality Parameters

PARAMETER	VALUE	GENOTYPES
(T.aestivum)		
Protein	> 12.50 %	HD 3226, DBW 168, UAS 375, NI 5439, NIAW 1415, UAS 387
Wet Gluten	~ 32.0 %	HD 3226, MACS 6478, MACS 6222, UAS 375, NI 5439, NIAW 1415, UAS 387, Cow (W) 1, HW 5216
Dry Gluten	>10.0 %	HD 3226, DBW 168, MACS 6222, UAS 375, NI 5439, NIAW 1415, UAS 387, Cow (W) 1, HW 5216
Gluten Index	> 80.0 %	WH 1105, DBW 196, WH 1202, DBW 173, HD 3059, HI 1617, WH 1080, HD 3171
Sedimentation value	≥ 60 ml	DBW 196, DBW 173, PBW 752, HI 1620, MACS 6677, HD 2967, DBW 187, HI 1612, HI 3171, BRW 3775, NI 5439
Grain Hardness Index	~ 85	DBW 90, HD 3043, K 0307, HD 2888, C 306, UAS 385, UAS 375, NIAW 1415, HW 2044, Cow (W) 1, UAS 387
	< 45	HS 611, DBW 168
Yellow Pigment	> 3.5 ppm	HD 3043, HD 2888, C 306, HD 3171, K 1317, DBW 168, UAS 304, NI 5439, HW 2044, Cow (W) 1, UAS 387
Iron	> 45.0 ppm	HD 2888, C 306, NI 5439, NIAW 1415, HW 2044, Cow (W) 1, HW 5216, UAS 387
Zinc	> 40.0 ppm	UP 2942, HD 3043, HD 3237, CG 1023, HD 2888, UAS 385, Cow (W) 1, HW 5216
(T.durum)		
Protein	>14.5%	HI 9777, MACS 4028, UAS 446
Sedimentation value	~ 40 ml	UAS 462, UAS 446
Grain Hardness Index	~ 90	UAS 462, UAS 446, AKDW 2997-16
Yellow Pigment	> 6.00 ppm	HI 8627
Iron	> 45.0 ppm	HI 8777, MACS 4028
Zinc	~ 45.0 ppm	UAS 462, HI 8791, HI 9777

All the *T.aestivum* 1st and 2nd year AVT entries including checks (227 nos.) were analysed for various quality traits which included grain appearance score, test weight, protein content, wet gluten, dry gluten & gluten index, extraction rate, grain hardness index & sedimentation value and nutritional traits like yellow pigment, iron & zinc.

Variability in the Quality Parameter of *T.aestivum* in AVT's

Parameter	NWPZ	NEPZ	CZ	PZ	SHZ	Overall
Grain Appearance (out of 10.0)	6.4 (5.4-7.3)	6.3 (5.4-7.2)	6.6 (6.0-7.1)	6.2 (5.7-6.7)	5.9 (5.6-6.2)	6.3 (5.4-7.3)
Test Weight (kg/hl)	80.0 (73.0-83.5)	79.5 (72.0-83.5)	80.1 (76.7-82.7)	79.8 (76.0-83.2)	76.8 (76.3-80.0)	79.6 (72.0-83.5)
Protein content (%)	11.60 (9.29-14.90)	11.23 (9.22-13.94)	11.56 (8.28-14.61)	12.91 (10.94-15.08)	12.19 (11.47-12.87)	11.71 (8.3-15.1)
Grain Hardness Index	76 (62-90)	76 (33-96)	78 (66-91)	77 (33-89)	87 (82-89)	77 (33-96)
Sedimentation value (ml)	56 (38-66)	53 (38-66)	56 (45-66)	48 (36-63)	44 (42-46)	53 (36-66)
Wet Gluten (%)	28.5 (20.3-36.9)	27.4 (19.9-33.5)	28.0 (21.0-34.1)	33.1 (26.5-44.4)	32.7 (30.9-34.8)	29.1 (19.9-44.4)
Dry Gluten (%)	9.2 (7.1-11.8)	9.1 (6.8-11.5)	9.3 (6.7-11.9)	10.6 (8.2-13.6)	10.2 (9.7-10.6)	9.4 (6.7-13.6)
Gluten Index (%)	74 (53-90)	65 (45-88)	74 (67-80)	53 (39-72)	59 (51-66)	68 (39-90)
Extraction Rate (%)	69.3 (67.1-72.3)	70.2 (64.6-74.2)	69.9 (68.1-73.6)	71.1 (66.5-74.1)	72.6 (71.8-73.8)	70.0 (64.6-74.2)
Yellow Pigment (ppm)	2.73 (1.85-3.99)	2.99 (1.83-4.13)	2.52 (1.93-3.15)	3.38 (2.48-4.19)	3.65 (3.28-4.13)	2.93 (1.83-4.19)
Iron (ppm)	38.4 (30.8-48.3)	40.6 (34.1-48.3)	39.0 (35.1-42.8)	40.4 (32.4-49.7)	54.7 (48.9-58.9)	40.3 (30.8-58.9)
Zinc (ppm)	36.2 (17.5-49.9)	35.0 (21.8-46.0)	38.9 (26.2-47.2)	33.4 (24.8-45.2)	46.7 (38.8-50.3)	36.4 (17.5-50.3)

In brackets are given the range values.

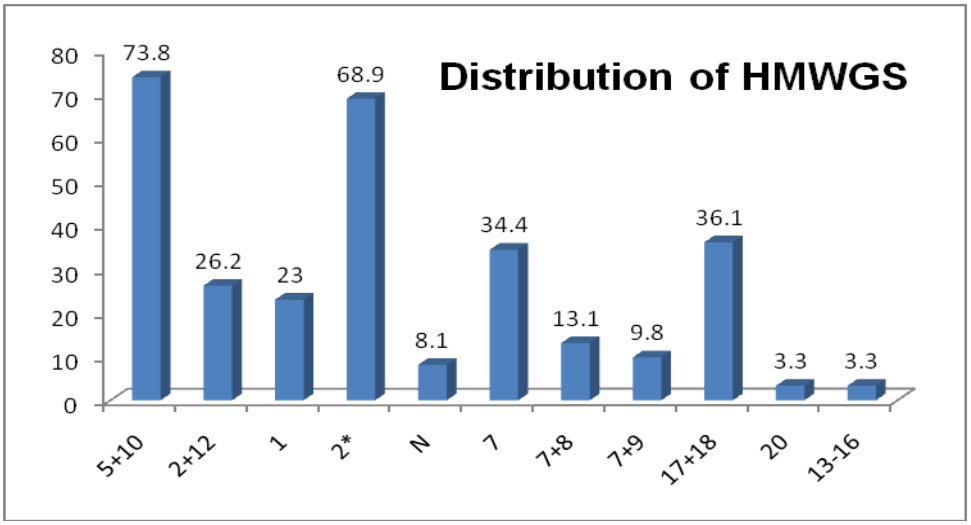
All the *T.durum* 1st and 2nd year AVT entries including checks (24 nos.) were analysed for various quality traits like grain appearance, test weight, protein content, grain hardness index, sedimentation value, yellow berry incidence and nutritional trials like yellow pigment, iron & zinc.

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

Parameters	CZ	PZ	Overall
Grain Appearance (Out of 10.0)	6.9 (6.0-7.8)	6.8 (6.4-7.3)	6.8 (6.0-7.8)
Test Weight (kg/hl)	81.4 (77.0-83.2)	81.0 (79.5-83.0)	81.2 (77.0-83.2)
Protein Content (%)	12.46 (10.01-14.98)	14.29 (12.07-15.10)	13.51 (10.01-15.10)
Grain Hardness Index	86 (72-97)	87 (82-93)	87 (72-97)
Sedimentation Value (ml)	36 (31-41)	36 (26-46)	36 (26-46)
Yellow Berry Incidence (%)	9.49 (0.0-29.3)	0.3 (0.0-2.4)	4.1 (0.0-29.3)
Yellow Pigment (ppm)	5.60 (4.93-6.44)	4.56 (3.59-5.31)	5.01 (3.59-6.44)
Iron (ppm)	39.9 (36.7-44.7)	45.9 (40.2-50.5)	43.3 (36.7-50.5)
Zinc (ppm)	43.1 (27.0-54.8)	40.1 (28.1-50.8)	41.4 (27.0-54.8)

In brackets are given the range values.

Sixty one (61), 2nd and 1st year AVT entries including checks were evaluated for High Molecular Weight Glutenin Subunits (HMWGS). Subunits 5+10 and 2+12 were present in 73.8 % and 26.2 % of the total entries, whereas entries having 1, 2* and N subunits were 23.0 %, 68.9 % and 8.1 % respectively. Likewise, percent entries having subunits 7, 7+8, 7+9, 17+18, 20 and 13+16 were 34.4, 13.1, 9.8, 36.1, 3.3 and 3.3 respectively.



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

Quality Parameters of *T.aestivum* in NIVTs

Trial	Condition	Zone	Grain Appearance (Max Score 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sediment. Value (ml)
NIVT 1A	ITS	NWPZ	5.7	77.9	11.00	43
NIVT 1A	ITS	NEPZ	5.7	77.0	10.39	42
NIVT 1A	ITS	Overall	5.7	77.4	10.69	43
NIVT 1B	ITS	NWPZ	6.8	77.5	13.10	44
NIVT 1B	ITS	NEPZ	6.9	78.5	11.70	40
NIVT 1B	ITS	Overall	6.9	77.8	12.40	42
NIVT 2	ITS	CZ	6.9	79.6	13.60	48
NIVT 2	ITS	PZ	6.8	78.8	12.90	43
NIVT 2	ITS	Overall	6.9	79.2	13.20	45
NIVT 3A	ILS	NWPZ	6.0	76.4	11.30	43
NIVT 3A	ILS	NEPZ	5.6	73.8	12.30	49
NIVT 3A	ILS	Overall	5.7	75.1	11.80	46
NIVT 3B	ILS	CZ	7.0	79.7	12.60	36
NIVT 3B	ILS	PZ	6.9	78.4	13.30	33
NIVT 3B	ILS	Overall	7.0	79.1	13.00	34
NIVT 5A	RITS	NWPZ	5.9	82.9	11.77	40
NIVT 5A	RITS	NEPZ	6.0	82.5	10.97	42
NIVT 5A	RITS	CZ	5.9	83.6	12.18	40
NIVT 5A	RITS	PZ	5.9	79.7	13.25	41
NIVT 5A	RITS	Overall	5.9	82.2	12.04	41
IVT	ITS	NHZ	5.9	78.0	12.66	43
IVT	RTS	NHZ	6.0	79.9	10.99	45
IVT	RES	NHZ	5.8	78.7	12.78	44
IVT	RILS	NHZ	5.4	77.2	12.74	48
IVT	RITS	SHZ	6.1	75.8	12.18	46

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

Quality Parameters of *T.durum* in NIVTs

Trial	Sowing Conditio	Zone	Grain App. (max. 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sed. Value (ml)	Yellow Berry (%)	Yellow Pigment (ppm)
NIVT 4A	ITS	CZ	6.3	82.8	12.00	40	1.0	5.8
NIVT 4A	ITS	PZ	5.3	82.2	12.10	40	4.7	5.8
NIVT 4A	ITS	Over All	5.8	82.5	12.10	40	2.8	5.8
NIVT 5B	RTS	CZ	7.4	85.0	11.59	32	15.0	4.21
NIVT 5B	RTS	PZ	7.5	82.3	15.00	31	2.0	4.29
NIVT 5B	RTS	Over All	7.5	83.7	13.29	32	8.0	4.25

Special Trials:

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

Quality Parameters of Genotypes in *T.dicoccum* Trial

Zone	Thousand Grain Weight (g)	Protein Content (%)	Sedimentation Value (ml)	Yellow Pigment (ppm)
PZ	40.74	13.0	26	2.30
SHZ	35.49	14.1	26	3.79
Overall	38.12	13.5	26	3.05

Quality Parameters of *T.aestivum* Genotypes in Salinity/ Alkalinity Trial

Centre	Grain Appearance (Out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)
Kanpur	5.6	79.9	10.5	38
Hisar	5.8	82.8	11.0	37
Karnal	5.9	83.2	9.2	40
Overall	5.7	82.0	10.2	39

Quality Parameters of Genotypes in *Triticale T*rial

Centre	Grain Appearance (Out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)
Shimla	4.4	71.4	13.4	32
Malan	5.8	73.8	10.5	32
Overall	5.1	72.6	11.9	32

Quality Parameters of *T.aestivum* Genotypes in *Very Late Sown* Trial

Centre	Grain Appearance (Out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Grain Hardness Index	Sedimentation Value (ml)
NWPZ	5.8	75.3	12.88	79	55
NEPZ	5.6	73.1	13.05	71	55
Overall	5.7	74.2	12.96	75	55

Quality Parameters of *T.aestivum* Genotypes in *Wheat MABB* Trial in NWPZ

Zone	Grain Appearance (out of 10.0)	Test Weight (kg/hl)	Protein Content (%)	Sedimentation Value (ml)	Grain Hardness Index	Iron Content (ppm)	Zinc Content (ppm)
Ludhiana	6.7	80.7	11.6	58	77	36.1	30.5
Delhi	6.6	80.8	12.0	57	79	38.6	44.1
Pantnagar	6.4	81.5	9.8	59	85	37.7	25.7
Durgapura	6.2	78.2	13.2	60	84	40.2	45.0
Hisar	6.8	79.9	10.4	59	74	35.0	40.3
NWPZ	6.5	80.2	11.3	59	80	37.5	37.1

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