

Wheat Quality (Work plan and recommendations)

Work Plan (2020-21)

Work Plan:

NIVT

NIVT entries will be analysed for grain appearance score, test weight, protein content, sedimentation value in both aestivum and durum genotypes. In addition, phenol reaction in bread wheat and yellow berry and yellow pigment in durum wheat will also be analysed.

Changes in work plan: NIVT 3B and NIVT 4 samples will now be analysed at ARI, Pune instead of MPKV, Rahuri.

- **NIVT 1A** (Irrigated Timely Sown) samples from Ludhiana, Hisar, Durgapura, Delhi, Pantnagar (NWPZ), Kanpur, Pusa, Varanasi and Sabour (NEPZ) will be analysed at PAU, Ludhiana.
- **NIVT 1B** (Irrigated Timely Sown) samples from Ludhiana, Hisar, Durgapura, Delhi, Pantnagar (NWPZ), Kanpur, Pusa, Varanasi and Sabour (NEPZ) will be analysed at RAU, Durgapura.
- **NIVT 2** (Irrigated Timely Sown) samples from Indore, Vijapur, Junagarh, Powarkheda (CZ), Dharwad, Pune and Niphad (PZ) will be analysed at SDAU, Vijapur.
- **NIVT 3A** (Irrigated Late Sown) AND **NIVT 5A** (Restricted Irrigation Timely Sown) Entries from Pantnagar, Hisar, Ludhiana, Durgapura, Delhi (NWPZ) & Pusa, Sabour, Kanpur, Varanasi (NEPZ) will be analysed at GBPUA&T, Pantnagar Centre.
- **NIVT 3B** (Irrigated Late Sown *T. Aestivum*) AND **NIVT 4** (Irrigated Timely Sown *T. durum*) samples from Vijapur, Indore, Powarkheda, Junagarh (CZ) and Dharwad, Niphad, Pune (PZ) will be analysed by the quality laboratory at ARI, Pune.
- **NIVT 5B** (Restricted Irrigation Timely Sown, both durum and aestivum) samples from Vijapur, Indore, Powarkheda, Junagarh (CZ) and Dharwad, Niphad, Pune (PZ) will be analysed at UAS, Dharwad.
- **Dicoccum** dehusked samples from Dharwad, Pune, Arabhavi, Kalloli and Ugar (PZ) will be analysed at UAS, Dharwad.
- **IVT (NHZ)** samples from Shimla, Almora and Malan will be analysed at ICAR-IIWBR, Karnal.

AVT

- **AVT samples** from all the centres mentioned in NIVTs and IVTs will be analyzed by ICAR-IIWBR, Karnal for various quality parameters including baking evaluation of IInd year entries. **Special Trial (HYPT)** samples will be analysed at ICAR-IIWBR, Karnal.

Quality Components and Wheat Biofortification Nursery (QCWBN)

- **Quality Components and Wheat Biofortification Nursery (QCWBN)** samples will be analysed at ICAR-IIWBR, Karnal for grain appearance score, test weight, protein content, grain hardness index and sedimentation value, Fe and Zn content. **Hand threshed samples using cloth should be provided for Fe and Zn analysis separately.** Followings are the 10 centres for providing samples for the nursery for quality analysis; Ludhiana, Karnal, New Delhi and Pantnagar (NWPZ); Kanpur and Varanasi (NEPZ); Indore and Vijapur (CZ) and Dharwad and Niphad (PZ)
- The last dates for supplying the samples by respective centres were finalised as follows:

NHZ	15 th June 2020
NWPZ & NEPZ	20 th May 2020
CZ	15 th May 2020
PZ	30 th April 2020
- All the wheat grain samples, duly cleaned and properly packed in polythene bags separately, enclosed in cloth bags should be sent by registered post parcel. The *T. dicoccum* samples should be sent after de-husking.
- All the co-operators, who will analyze the wheat samples of various NIVTs and Special Trials should send the data to ICAR-IIWBR, Karnal positively by 15th July, 2020, by e-mail in the format used in annual report.

Recommendations

- It is recommended to use bench marks of traits in combination to identify superior entries for different end-use products and nutritional quality traits having distinct superiority in the trial. The details of bench marks are given below.
- It is recommended to have breeding for soft and hard wheat classes separately in bread wheat. Emphasis should be on high yellow pigment and protein content with strong gluten in durum wheat. This is required to meet the rising demand of baking products in the country. For this purpose quality and breeders should go hand in hand
- Issue of nutritional quality was discussed in length and it was suggested to develop catalogue/technical bulletin of nutritional quality traits including bioavailability of Fe and Zn, dietary fibre, resistant starch, glycemic index etc of popular released varieties. For this purpose institutions (including NABI, Mohali, NIN, Hyderabad, NIFTAM, Kundli) where such facilities are available will be involved.
- Self assessment and reviewing the AICRP-WAB programme as a whole should be done under the chairmanship of ADG (FFC) to identify quality traits for evaluating AICRP trials.
- Since protein content showed large variations across centres and zones, it is suggested that after keeping in view the total N requirement, the possibility of balancing added N-fertilizer with the available N, may be explored.
- For checking uniformity of data, PI quality should provide check samples of selected wheat varieties to coordinating centres where NIVT s are being analysed. In turn centres should also send few random samples to ICAR-IIWBR, Karnal for checking data uniformity and thus minimising the lab to lab variations.
- Considering the nutritional and therapeutic value of Dicoccum wheat, the dicoccum trials should be analyzed for nutritional parameters like protein content, total dietary fiber, soluble fiber, resistant starch content, Zn and Fe content.
- It is recommended that samples from a centre having average value of hectolitre weight below 73.0 will not be used for further analysis and thus no data of the centre will be reported.
- Because of Covid-19 crisis, samples from Mandi/Farmers' filed could not be collected during this year, it is therefore, recommended that AICRP centres involved in sending trial samples for quality analysis in different zones should collect and send samples from Mandi/Farmers' filed samples for quality analysis ICAR-IIWBR, Karnal.

Proposed Wheat Quality Bench Marks

Proposed bench marks for wheat quality traits for promotion based on distinct quality advantage. There are 5 major groups based on end-product and nutritional quality. Promotion based on one trait only may not be desirable and hence groups have been identified having some traits in combination for end-product as well as nutritional quality. Since quality traits are also affected by the environment, therefore combination of traits is required to ascertain better wheat quality.

	Traits	Group I Hard wheat for Chapati	Group II Hard wheat for bread	Group III Soft wheat for biscuits etc	Group IV Durum wheat for pasta	Group V Nutritional quality
1	Hectolitre weight (kg/hl)	>76	>76	>76	>78	>76 (A) >78(D)
2	Grain Protein % (at 12% MB)	>12.5	>13.0	<11.0	>13.0	>13.0
3	Sedimentation volume (ml)	50-60	>60	<35	>45	-
4	Grain hardness index by SKCS	>80	>75	<35	>80	-
5	Phenol reaction (1- 10 scale)	<3.0	-	-	-	-
6	Yellow pigment (ppm)	-	-	-	>8.0 ppm	-
7	Fe (ppm)	-	-	-	-	>40
8	Zn (ppm)	-	-	-	-	>40

A= Aestivum; D=Durum