



**Barani Agricultural Research
Station, Fateh Jang**

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ANNUAL ABRIDGED REPORT FOR THE YEAR 2017-18

Overview

Punjab is the major wheat producing province accounting for more than 70% of area and 73% of the national production while the Barani areas contribute about 8% of total wheat production and 12% area under wheat cultivation in Punjab. Good crop production in rainfed areas enhances the overall wheat production and per acre yield of the country. However, wheat crop in Barani area faces many abiotic and biotic stresses that badly affects the crop production and results in severe economic losses annually. Among the other Rabi crops, chickpea holds an important position due to its nutritional value in terms of high protein contents and is grown in most of the Barani areas in Punjab. Total area and production of chickpea in Pakistan was 931 thousand hectares and 359 thousand tonnes respectively during 2016-17. Consumption of white chickpea (kabuli) in Pakistan is more than its production and precious foreign exchange is being spent to import white chickpea to meet the domestic requirement. Brassica (Rapeseed and Mustard) is another most important oilseed crop which is mostly grown in the barani tract of the punjab. During 2016-17, total area and production of brassica was 193 thousand hectares and 179 thousand tones, respectively (Pakistan Economic Survey 2016-17). Moreover, Kharif pulses like mung and mash provide important source of dietary protein for low income farmers of this region and high yield/production of these crops help to improve their financial/living standards. Barani Agricultural Research Station (BARS), Fatehjang planned to improve the yield of the existing varieties of major kharif crops through improved management, production technology and evolution of new cultivars through selection and hybridization of elite sorghum genotypes based on their disease/stress tolerance and yield performance.

During rabi 2017-18, twenty six (24) research experiments were conducted at our research station and following results were obtained.

SORGHUM

Ten crosses were attempted and all were successful. Data regarding different parameters such as Days to 50% flowering, Days to 50% maturity, Plant length, Grain yield and Fodder yield was taken. Moreover, 07F1, 07F2, 06F3, 05F4, 10F5 and 04F6 generations of sorghum comprising a total of 39 entries were studied and 07F1, 05F2, 04F3,

S #	Candidate Lines	Yield Kg/ha
1	entry no. B	1884.92
2	entry no. A	1741.27

04F4, 06F5 and 03F6 entries were selected for further evaluation in their next generations.

MUNG

Sixteen promising lines of mung were evaluated for their grain yield performance. Candidate entry no 107 and 108 gave higher yield while entry

no. 101 showed lowest yield.

S #	Candidate Lines	Yield Kg/ha
1	entry no. 107	534.72
2	entry no. 108	489.58
3	entry no. 101	192.92

MASH

Nine Mash lines in National Trial and Fourteen Mash entries were assessed for their grain yield performance. Candidate entry no 105 and 108 gave higher yield while entry no. 109 showed lowest yield.

S #	Candidate Lines	Yield Kg/ha
1	entry no. 105	590.28
2	entry no. 108	555.56
3	entry no. 109	309.86

While in Mash adaptation yield trial, Candidate entry no 107 and 105 gave higher yield while entry no. 111 showed lowest yield.

S #	Candidate Lines	Yield Kg/ha
1	entry no. 107	565.97
2	entry no. 105	493.06
3	entry no. 111	277.78

GUAR

Three Guar promising lines were assessed for their grain, green fodder and dry matter yield performance.

WHEAT

Regarding hybridization, 110 targeted crosses were successfully threshed for further studies. Moreover, filial generations of wheat (F₁-F₈) comprising a total of 356 crosses / progenies,

were studied. F₁ consists of 102 entries while F₂, F₃ and F₄ generations consisting of 96, 64 and 33 single head bulk progenies respectively. While in F₅, F₆ and F₇ and F₈, 842, 527, 216 and 134 single head progenies were studied, respectively. Out of them

S #	Candidate Lines	Yield Kg/ha
1	15FJ12	5715
2	15FJ05	5347
3	15FJ26	5076
4	BARS-09	4062
5	Fatehjang-16	3180

90 entries of F₁, 67 of F₂, 40 of F₃, 23 of F₄, 20 of F₅, 16 of F₆, 4 of F₇ and 4 of F₈ were selected for generation advancement on the basis of their performance, phenotype, resistance against diseases specially yellow rust in addition to other high yield attributing characteristics for further evaluation.

35th Semi Arid Wheat Screening Nursery and 50th International Bread Wheat screening Nursery comprising of 560 entries received from CIMMYT were studied and 130 entries were selected, on the basis of their high yield and resistance against yellow rust disease. Similarly 50 genotypes each were evaluated in 25th Semi Arid Wheat Yield Trial, 38th Elite Selection Wheat Yield Trial, that were received from CIMMYT and 30 entries were selected for their yield performance and disease resistance.

In preliminary yield trial (A-1 & A-2) comprised of twenty four entries including 2 checks each were tested for their grain yield performance under rainfed conditions. Out of these entries 18 entries were selected for inclusion in regular yield trail 2018-

19.

In regular yield trial, twenty eight entries including 2 checks were tested for their grain yield performance under rainfed conditions and three entries viz; 15FJ12, 15FJ05 and 15FJ26 were selected for inclusion in PUWYT 2018-19.

15FJ12, 15FJ05 and 15FJ26 gave higher grain yield than the two check varieties i.e. BARS-09 and Fatehjang-16. Detail of trial is given below:

In Punjab Uniform Wheat Yield Trial, sixty entries from different institutes of Punjab were evaluated. Entry no. 19 gave the maximum yield of 5944 kg/ha followed by Entry no. 01 which produced 5905 kg/ha. However, lowest yield was recorded in entry no. 12 (3077

kg/ha).

S #	Candidate Lines	Yield Kg/ha
1	Entry no. 19	5944
2	Entry no. 01	5905
3	Entry no. 12	3077

CHICKPEA

Twenty five crosses were performed among selected genotypes to incorporate drought tolerance and blight resistance into white chickpea; out of them twenty were successful. Moreover, 11 F₁, 3 F₂, 3 F₄, 14 F₆ and 8 F₇ progenies were also studied and 11 F₁, 2 F₂, 52 (SPS) F₄, 20 F₆ and 10 F₇ progenies were selected from the above mentioned generations for further advancement.

One chickpea (k) screening nursery was studied during rabi 2017-18 that was received from NIAB, Faisalabad. It comprised of

80 entries and evaluated for blight and drought tolerance.

34 kabuli chickpea genotypes including 2 check (Tamman-13 & Noor-2009) were evaluated in preliminary yield trials for their yield performance under rainfed conditions.

Eight kabuli chickpea genotypes including 2 checks (Tamman-13 & Noor-2009) were evaluated in preliminary yield trials for their yield performance under rainfed conditions.

Chickpea Micro yield trial received from BARI, Chakwal, comprised of 10 chickpea (kabuli) genotypes for their blight and yield performance under rainfed conditions.

Chickpea Micro yield trial received from Pulses Research Institute, Faisalabad, comprised of

14 chickpea (kabuli) genotypes.

Chickpea Micro yield trial received from Pulses Research Institute, Faisalabad, comprised of 18 chickpea (kabuli) genotypes.

Chickpea NUYT Desi & Kabuli trials were conducted to evaluate yield performance of 25 desi genotypes and 12 kabuli genotypes under rainfed conditions.

LENTIL

Lentil NUYT trial was received from NARC, Islamabad comprising of 16 entries including two checks (Markz-09 & Masoor-2009).

One Lentil Micro Trial was received from Pulses Research Institute, Faisalabad. It comprised of 14 entries.

Publications

1. **Zeeshan, M., W. Arshad, M. I. Khan, S. Ali, A. Nawaz, A. Batool, M. Tariq, M. I. Akram and M. A. Ali. 2018. Breeding for pre-harvet sprouting resistance in bread wheat under rainfed conditions. Front. Agri. Sci. Eng.**
2. **Khan, M. I., M. Zeeshan, W. Arshad, S. Ali, A. Nawaz, A. Batool and M. Tariq. 2018. Performance Evaluation of Sorghum Varieties in Pothwar Areas of Pakistan. Int. J. Adv. Res. 6(1): 1202-1205.**
3. **Khan, M. I., W. Arshad, M. Zeeshan,, S. Ali, A. Nawaz, A. Batool and M. Fayyaz. 2018. Screening of chickpea kabuli (*Cicer arietinum* L.) Germplasm against Ascochyta Blight (*Ascochyta rabiei*). J. Bio & Env. Sci. 2(2):128-132.**