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COMPARISON OF YIELD AND YIELD COMPONENTS OF WHEAT VARIETIES UNDER IRRIGATION

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The Comparative performance of adapted wheat varieties, Maxi Pak-65 and Chenab 70 and some University selections, LU-75, LU-229 and C-89 was investigated. The results showed that all the varieties yielded well but Chenab 70 gave the highest yield of 54.94 maunds of grain per acre and was significantly superior to all other varieties except Mexi Pak-65 which yielded 49.61 maunds of grain per acre. However, amongst the University selections, LU-229 and C-89 appeared to be promising and almost similar in performance with regard to productive tillering and grain yield per acre.

INTRODUCTION

Wheat like other plants possesses a wide range of ecological adaptability and is grown both under irrigated and unirrigated environment in Pakistan. Seed germination, growth and plant hardiness are all influenced by the genetic make up and environmental conditions. A high-potential variety behaves quite differently under varying soil and climatic conditions as compared to low potential variety. According to Pendleton and Dunghan (1960) variety selection has the greatest effect on grain and straw yield. However, Johnson *el. al.* (1966) and Woodward (1966) reported that short statured varieties were more productive than taller ones.

Information available on various aspects of agronomic behaviour of wheat crop under local conditions shows that wheat plant responds differently to growing conditions and specific management practices (Larson 1969, Qureshi 1971). Selection of highly potential varieties with long range of adaptability is therefore highly essential for bringing about significant improvement in the existing level of wheat yields in Pakistan. The objective of this study was, therefore, to evaluate the yield performance of the approved and some new University selections under irrigation at Lyallpur.

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MATERIALS AND METHODS

The study was conducted at University of Agriculture, Lyallpur, during the yerr 1873-74. Preceding crop was early Kharif fodder. The varieties included in the trial were Chenab-70. Mexi Pak 65, LU 75, LU 229 and C 89. The experiment was laid in a randomized complete block design with four replications. The net plot size was 1/121 th acre. The crop was sown on a well prepared seed bed in the second week of November with single-row hand drill in rows 9 inches apart. The seed rate used was 32 seers per acre. The crop was fertilized with 100 lbs of nitrogen in urea in two equal doses, one at sowing and the other at the first irrigation. All other cultural practices were uniform for all the treatments.

For recording germination counts, a unit area of four and a half spuare feet (2'x2¼') was randomly earmarked at three different places in each plot. Similarly, fertile tillers per unit area were determined by actually harvesting the same four and a half square feet area from three selected place in each plot. For detailed observations on the number of spikelets and grains per spike, 1000-grain weight and plant height, etc., 100 tillers were randomly taken from the sample harvested from a unit area in plot.

The data were statistically analysed by the analysis of variance method and Duncans' multiple range test at the 5% probability level was employed to test the significane of the treatment means.

RESULTS AND DISCUSSIONS

The data pertaining to the main yield components presented in Table 2 revealed that germination was highly variable in all the varieties. Mexi Pak 65 gave significantly more germination counts per unit area than the rest of the varieties but remained at par with LU 75. The lowest germination counts per unit area were recorded for C 89. The high germination in the case of Mexi Pak 65 was probably due to the smaller size of grains that resulted in greater number of grains per unit weight as compared to the rest of the varieties.

The fertile tillers per unit area (2' x 2¼') were significantly greater in Chenab 70 than in LU 229 which in turn was significantly superior to LU 75, Mexi Pak 65 and C 89. This clearly indicates that the genetic potential of Chenab 70 with regard to tillering is much higher than all other varieties. However, LU 229 appeared also the promising one in this respect.

As regards the number of grains per ear, Mexi Pak 65 produced significantly higher number of grains per ear than all other varieties except LU 75. The high number of grains per ear in Mexi Pak 65 was due to more spikelets per ear as compared to rest of the varieties.

TABLE I. *Yield performance data of different varieties.*

Varieties	Germination counts per unit area (2'x2¼')	Fertile tillers per unit area (2'x2¼')	No. of grains /spike	100-grain Wt. (grams)	Grain yield per acre (Maund)
1. Chenab 70	82.75b	230.50a	36.69cd	39.55a	54.94a
2. Maxi Pak 65	116.25a	155.00c	49.57a	33.77b	49.61ab
3. LU 229	89.50b	190.00b	42.56bc	34.30b	43.95bc
4. C 89	66.75c	151.50c	35.16d	40.40a	42.73cd
5. LU 75	113.75a	160.75c	44.60ab	38.77a	37.01d

Values sharing a letter are not statistically different

The results regarding the weight of 1000 grains revealed that C 89, Chenab 70 and LU 75 did not differ among themselves. The lowest grain weight (33.77 gms) was obtained for Mexi Pak-65 which was at par with LU 229. It clearly shows that the grain development in Mexi Pak 65 was poor as compared to all other varieties. It may probably be due to greater number of spikelets and grains per ear which ultimately led to greater competition for food and moisture.

As is evident from Table I, the level of yield was fairly high in all the varieties but Chenab 70 gave significantly higher grain yield per acre than all other varieties expect Mexi Pak 65 which was at per with LU 229. However, the varieties LU 75 and and C 89 produced the lowest grain yield of 37.01 and 42.73 maunds/ acre, respectively.

The highest yield in case of Chenab 70 in apparently due to bold grains and greater number of fertile tillers per unit area at harvest which are of course genetically controlled. In conclusion Chenab 70 and Mexi Pak 65 appeared to be the best varieties in all respects followed by LU 229 a University selection. The findings are in accordance with those of Pendleton and Dunghan (1960), Lukyanenko (1965), Woodward (1966), Johnson (1966), Kobelt (1970) and Qureshi (1971).

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