Pak. J. Agri. Sci.
25(3) 212 ,1988

YIELD PERFORMANCE OF THREE WHEAT CULTIVARS UNDER VARYING LEVELS OF NITROGEN:

Malik A.Hayee, Muhammad Asghar Malik, M.Rafiq Sabir & M.R.Hussain

Department of Agronomy, University of Agriculture, Faisalabad.

The studies pertaining to the effect of different levels of nitrogen viz. 0,50,75 and 100 kg ha^{-1} on the growth and yield behaviour of three wheat genotypes, Lu-26s, Kohinoor-83 and Faisalabad-83, were conducted on a sandy clay loam soil under Faisalabad condition. The results led to the conclusion that nitrogen affected the growth and yield parameters significantly over control. However, application beyond the level of 75 kg N ha^{-1} did not help in increasing grain yield to a significant extent. All the three varieties under study exhibited almost similar growth behaviour and did not differ significantly in yield performance from one another.

INTRODUCTION:

Wheat (Triticum aestivum L.) is grown in Pakistan on an area of 7.26 m.ha with the annual production of 11.70 m.tonnes,the average yield is 1612 kg ha^{-1} (Anonymous 1985). This per hectare yield is far below the inherent potential of the existing recommended promising varieties. Among the various yield determining factors, soil fertility status is of prime importance. The role of mineral fertilizers to make up nurent deficiency in sail is well recognized because these are easy to handle and produce quick results. The researchers like Lal and Bhargava (1982), Masud and Bhatti (1983), and Sherin (1985) from their experiments on wheat conducted at different locations under varying level of nitrogen (0-120 kg ha^{-1}.) concluded that increasing level

of applied nitrogen consistently increased grain yield but in most of the cases application above 90 kg $_{N}$ ha^{-1} favoured lodging of the crop, resulting in decreased yield.

Moreover, some researchers like Chaudhry and Rafique (1984), Ghosh and Mukhopadhyay (1984), and Lal (1984) on the basis of results achieved through varietal comparison trials, maintained that the crop varieties differed in performance and exhibited different behaviours even if treated alike.

Keeping in view these findings, it was contemplated in this study to evaluate the comparative yield potential of three cultivars at different levels of nitrogen under Faisalabad conditions.

MATERIALS AND METHODS:

The investigations were carried out at University of Agriculture, Faisalabad during the year 1985-86 on a sandy clay loam soil. The experimental treatments comprised three varieties viz. LU-26S, Kohinoor-83, Faisalabad-83, Faisalabad-83 and four nitrogen levels viz. 0,50,75 and 100 kg N ha.$^{-1}$ The experiment was quadruplicated using split plot design. The nitrogen levels and varieties were randomized in the main and sub-plots, respectively. The net plot measured 2.5 x 6 m. The crop was sown in first week of December. A basal dose of 60 kg P_2O_5 ha^{-1} was applied before sowing. Nitrogen was applied in two splits i.e. half at sowing and half with first irrigation. All other agronomic practices were kept uniform. The crop was harvested in April. Observations on different growth and yield parameters were recorded using standard procedures. The data obtained were analysed by analysis of variance method and Duncan's New Multiple Range Test at 5 % level of probability was used to compare the treatment means. (Steel and Torrie, 1980).

RESULTS AND DISCUSSION:

The results pertaining to important growth and yield parameters are presented in Table-I. A perusal of the data revealed that increasing nitrogen levels, in general, improved tillering. However, nitrogen levels did not differ

Table 1. *Yield and yield components of three wheat cultivars as affected by nitrogen application in different rates.*

Treatments	Total Tillers m^{-2}	Productive tillers m^{-2}	Final plant hight(cm)	No.of grains per spike	1000-grain wt. (gm)	Grain Yield (q ha^{-1})
A. *Nitrogen Levels*						
1. Control	536.50 b	524.66 b	93.91 b	49.26	42.19	39.57 c
2. 50 kg ha^{-1}	632.25 ab	619.42 a	97.16 a	49.63	42.66	43.12 b
3. 75 kg ha^{-1}	669.83 a	655.92 a	97.96 a	50.54	44.14	49.07 a
4.100 kg ha^{-1}	724.83 a	704.00 a	98.73 a	50.82	44.86	50.05 a
SE	31.12	30.34	0.40	1.82	0.90	1.00
B. *Varieties*						
1. LU-26S	621.25 b	607.13 b	95.17 b	41.63 b	52.41 a	46.29
2. Kohinoor-83	685.31 a	668.56 a	98.51 a	53.78 a	38.44 b	46.43
3. Faisalabad-83	616.00 b	602.31 b	98.31 a	54.79 a	41.64	45.15
SE	10.96	10.92	0.77	1.06	0.74	0.81

Any two means not sharing a letter differ significantly at 5 % level of probability.

significantly in their behaviour from one another although addition of N significantly increased tillering over control. The varieties Kohinoor-83 showed better tillering capacity and differed significantly from LU-26S and Faisalabad-83 which exhibited similar behaviour.

As regards plant height, the nitrogen application invariably resulted in taller plants than control, whereas, amongst the varieties, Kohinoor-83 and Faisalabad-83 produced significantly taller plants than LU-26S.

Number of grains per spike was not affected by varying levels of nitrogen. It indicates that this character is more stable and is genetically controlled. However, amongst the varieties, Kohinoor-83 and Faisalabad-83 out crossed LU-26S in producing grains per spike.

It is evident from the data that varying nitrogen levels did not affect significantly 1000 grain weight. But the varieties showed a different behaviour and LU-26S produced bold and heavier grains than the others and was followed by Faisalabad-83 and Kohinoor-83. The final grain yield per hectare is attributable to the cumulative effect of various yield parameters. It appears from the Table that there was a linear increase in grain yield with increasing level of nitrogen, and all the levels differed significantly in performance from control.

However, because of similar response exhibited by 75 kg and 100 kg $N_1 ha^{-1}$ it appears wasteful to use nitrogen beyond 75 kg ha^{-1} under the conditions of this experiment. These results support the findings of Sherin (1985). The cultivars showed almost similar performance and the yield level was fairly high in all the varieties. This was so because this superiority of one variety over the other was compensated by a varying degree of performance of yield components, resulting in almost similar final yield. These results are in agreement with those of Masud and Bhatti (1983).

From the results it can safely be concluded that, over ll, the varieties under study were genetically vested with 'gh yield potential and , to exploit their potential

maximum, an application of 75 kg N ha^{-1} was justified under the condition of this experiment.

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