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EFFECT OF DIFFERENT LEVELS OF NPK ON THE GROWTH AND GRAIN YIELD OF TWO WHEAT VARIETIES Pak-81 & Pb-85

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An experiment to investigate the effect of 0-0-0, 50-50-0, 75-50:P, 100-50-0, 125-50-0 and 125-50-50 kg NPK ha treatments on the growth and grain yield of wheat varieties Pak-81 and Pb-85 was conducted during 1986-87. All the NPK levels significantly affected the number of fertile tillers, plant height, 1000-grain weight and grain and straw yields of both the varieties. The highest grain yields of 42.6 q ha in var. Pak-81 and 40.8 q ha in var. Pb-85 were recorded with the application of 125-50-50 kg NPK ha .

INTRODUCTION

During the last decade the wheat acreage has increased by less than one percent but production has increased by more than 37 percent, mainly due to the wider use of fertilizers and improved varieties.

In Pakistan, nitrogen and phosphorus application contributes more to yield increase as compared to potassium (Ahmad and Nazir, 1978). Results similar to this have also been reported by Malik et al. (1985) who obtained a positive response in wheat to all the three macro nutrients.

Wheat varieties differ in their responses to varying doses of NPK fertilizers. Gandapur and Bhatti (1983) conducted a two years trial on wheat cultivars Tarnab-73. Maxipak-69,

Kh_~shhal-69 and Blue Silver with 0-180 kg Nand/or 65 kg P_2O_5 ha and found that Khushhal-69 yielded highest and it was followed by Maxipak-69. Ashraf (1987) stated that various yield components of wheat varieties Pak-81, LU26S and Kohinoor-83 showed differences in their responses to the application of fertilizers.

The present study was taken up to see the effect of different levels of NPK on the growth and yield of two wheats, namely Pak-81 and Pb-85 under Faisalabad conditions.

MATERIALS AND METHODS

The present investigations were carried out at "Ochkera" Research Farm, University of Agriculture, Faisalabad during the year 1986-87 on a sandy loam soil having 0.066 % total N, 14.75 ppm. available P and 134 ppm available K. The experiment was laid out in a split plot design, quadruplicated and the net plot size was 2.5 x 1.0 m. Different fertilizer levels and varieties were randomised in the main and sub-plots, respectively. The ferilizer treatments were FO (control), Fl (50-50-0), F2 (75-50-0), F3 (100:10-0), F4 (125-50-0) and F5 (125-50-50) kg N, PO, K ha • Nitrogen, phosphorus and potassium were appneJ in the form of urea, SSP and potassium sulphate. The whole dose of P and K in combination with half of N was applied (at sowing and remaining) nitrogen with the first irrigation at tillering. All other practices were normal during the crop growth period. The data collected on different growth and yield parameters were analysed statistically by Fisher's method of analysis of variance and Duncan's New Multiple Range Test at the 5 % probability level was employed to test the significance of treatments means (Steel & Torrie, 1980).

RESULTS AND DISCUSSION

The data collected on different growth and yield parameters as affected by different fertilizer treatments are presented in Table-L Germination counts per unit area of both the varieties were statistically the same in all the fertilizer treatments including control. It showed that both the varieties germi-

Table 1. *Effect of different NPK levels on germination and yield contributing factors of Pak-81 and Pb-85.*

Pak-81	F_0	[illegible]	[illegible]	39.0c	35.4d	16.0e
	F_1	[illegible]	245d	47.7b	[illegible]	33.7d
	F_2	[illegible]	[illegible]	47.8b	40.4b	36.6c
	F_3	[illegible]	[illegible]	51.0a	42.0ab	39.2b
	F_4	[illegible]	[illegible]	49.7a	44.3a	41.0ab
	F_5	[illegible]	[illegible]	48.5ab	44.8a	42.6a
[illegible]	F_0	[illegible]	161e	32.8c	36.2c	15.2d
	F_1	[illegible]	243d	36.2b	40.4b	27.3c
	F_2	[illegible]	[illegible]	37.8b	41.4b	33.7b
	F_3	[illegible]	[illegible]	39.2a	43.3a	39.8a
	F_4	[illegible]	303a	39.3a	45.0a	[illegible]
	F_5	[illegible]	306a	40.7a	44.7a	40.8a
[illegible]		[illegible]	[illegible]	0.9	[illegible]	0.6

Any two means not sharing a letter in common differ significantly at 5% level of probability (DMRT)
NS = Non-significant.

nated uniformly in all the plots and seed germination depended mainly on the reserve food material present within the seed.

The number of fertile tillers per plant increased progressively with increase in the aRplicat~qn of nitrogen with phosphorus kept at constant level of 50 kg ha • The application of complete fertiliter (F 5) though increased the number of fertile tillers plant over that of F4' but the difference in them was non-significant in both the varieties. The highest number of fertile tillers was 311 and 306 in varieties Pak-81 and Pb-85, respectively. The control treatment, however, produced the minimum tillers per plant. The application of fertilizer had ameliorative effects on this important yield contributing factor but the complete fertilizer application did not differ from that of N + P applications.

Similar trend of results was found in other yield parameters of both the varieties i,e. the increased application of nitrogen helped increasing the number of grains per spike, 1000-grain weight and the !inal grain yield. The application of nitrogen beyond 100 kg ha with a constant dose of phosphorus did not significantly increase the number of grains per spike and 1000-grain weight in either Pak-81 or Pb-85. Similar response of grain yield was observed to the application of fertilizers (N + P) in both the varieties. Moreover, the application of K_2O alongwith N + P did not show its superiority in any of the~f parameters over N + P applied @ 100 N + 50 P2O kg ha . The number of grains per spike, 1ODD-grain welgh~ and grain yield were significantly the lowest of all treatments in the control in both the wheats. These results suggest that the two newly evolved varieties had similar final yield potential though the number of grains per spike was higher in Pak-81 than in Pb-85. They, however, did not vary much in the weight of 1000-grain and consequently the grain yield. It is seen that fertilizer applica~ion. is necessary to enhance _)'/hea r production and that the application of N beyond 100 kg ha with a cUClsta~t dose of P_2O_5 (50 kg ha-I) with or without K_2O (50 kg ha-) did not prove beneficial for either Pak-81 of Pb-85 wheats under Faisalabad conditions. These results are quite in line with those of Ahmad and Nazir (I978), Hayee and Amanullah *(1972)* and Malik et al. *(1985).*

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