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EFFECT OF DIFFERENT NPK COMBINATIONS ON THE GROWTH, YIELD AND QUALITY OF MAIZE

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The effect of different NPK combination viz 0, 100-50-0, 100-50-30, 100-50-60 and 100-50-90 kg/ha. on the yield and grain quality of maize UM 81 was studied during 1981. The application of NPK in a combination of 100-50-60 kg/ha increased plant height, grains per cob, and 100-grain weight significantly over control. Tasselling, silking and maturity were delayed in the fertilized plots over the control. Protein contents in grain were affected appreciably with the application of NPK. However, the application of K beyond the level of 60 kg/ha in combination with 100 kg^{N}+50kg P_2O_5 did not help in improving the protein contents in grain and on the other hand tended to reduce it to a considerable extent.

INTRODUCTION

Maize (*Zea mays* L), an important kharif cereal crop of Pakistan, is grown on an area of about 0.70 million ha. with total annual production of about 0.90 million tons. In the recent years this crop has gained much importance due to its increased usage as a supplement food for human beings, a palatable feed for livestock and in the manufacture of various industrial products.

Keeping this in view the present study was planned to evaluate the effect of varying rates of K in combination with a recommended dose of NP on growth, yield and grain quality of a newly evolved maize genotype UM 81 under irrigated conditions at Faisalabad. According to Qureshi [5] supplementing nitrogen with phosphorus and potassium increased the maize grain yield and protein contents. Akram [1] studied the effects of fertilizers on different soils and found that potassium increased the yield of maize often on sandy soils compared to loamy soils, while Shukla and Mukhi [7] observed that increase in the yield of maize grain with potassium application.

MATERIALS AND METHODS

A study was undertaken to investigate the effect of various combination of NPK on growth, yield and grain quality of a maize variety UM81. The work was conducted on a sandy loam soil in 1981. The NPK rates were 100-50-0, 100-50-30, 100-50-60, 100-50-90 kg/ha against control.

Half of the N and whole of the P_2O_5 and K_2O respectively were added at the time of sowing, while the remaining half of the N was applied when the plants were about 60–75 cm high. Observations were recorded with regard to plant height at maturity, number of days taken to tasselling, silking and maturity, as also grain yield/ha and protein content in grains.

The data obtained were subject to the analysis of variance techniques and Duncan's Multiple Range Test at 5 percent probability was used to test the significance of treatment means [8].

RESULTS AND DISCUSSION

The resutls presented in Table 1 reveal that the different rates of NPK have significant effect on plant height, grain yield, number of days taken to tasselling, silking and maturity. Protein content was also affected significantly by the different rates of NPK. Altaf [2] noted that plant height increased significantly by the application of 100 lb. N 100 lb. P_2O_5 while Shukla and Mukhi [7] reported that height increases in the shoot with potassium. Observation regarding the grain yield per hectare indicates that the maximum grain yield was obtained with the application of 100-50-60 NPK kg/ha. Satyanarayana *et al.* [6], Chuiko and Ivaslchenko [3] observed that the application of NPK at the rate 120 kg N + 120 kg P + 120 kg K_2O/ha gave the highest average grain yield.

Protein contents of grains were affected significantly by the NPK applications. Highest crude protein contents of 17.28% was recorded in plots receiving 100-50-60 kg NPK/ha. The results are in conformity with those of Khattack *et al.* [4] and Chuiko and Ivashchenko [3].

Table 1. Effect of different NPK combinations on the growth, yield and quality of maize.

Treatments Fertilizer rates kg/ha NPK	Plant height (cm)	Days taken to tasselling	Days taken to silking	Days taken to maturity	Grain yield (quintals)	Protein content percentage
	(1)	(1)	(1)		(1)	(1)
T_0 = (0-0-0)	162.2 b	43.1 b	51.42 b	76.17 d	28.91 b	11.15 e
T_1 = (100-50-0)	202.14 a	43.8 b	57.02 a	79.02 ed	33.27 b	13.34 e
T_2 = (100-50-30)	212.6 a	44.2 b	58.57 a	81.82 be	48.71 a	14.65 c
T_3 = (100-50-60)	208.27 a	47.2 a	58.47 a	83.65 ab	50.38 a	17.28 a
T_4 = (100-50-90)	204.6 a	45.1 ab	58.82 a	87.07 a	47.81 a	15.86 b

(1) Means not sharing a letter in common differ significantly.

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