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STUDIES ON THE GROWTH AND YIELD PERFORMANCE OF SOME NEW MAIZE GENOTYPES

S.U. Rehman, T. Mahmood, M. Hussain, Ehsan Ullah & A. Hussain
Department of Agronomy,
University of Agriculture, Faisalabad

A comparative study on growth and yield performance of maize cultivars, Neelum, Sunehri, UM-31, Baymesal and Akbar was conducted in a sandy clay loam field. The crop was sown on August 8, 1989 in the pattern of 90 cm apart double-row strips and harvested on November 17, 1989. A basal fertilizer dose of 150-100 kg NP ha^{-1} was used. The highest grain yield of 40.67 q ha-1 was obtained from Neelum which was statistically equal to that obtained from Sunehri (39.25 q ha^{-1}). The yield differences among UM-31, Baymesal and Akbar were found to be non-significant. Akbar and Baymesal gave significantly higher harvest index than rest of the three maize cultivars which were at par with one another. Neelum produced maximum while UM-31 minimum grain.

INTRODUCTION

Maize *(Zea mays* L.) is one of the important cereals of the world and occupies a vital position in the economy of Pakistan. It is used as fodder and silage. A large quantity of maize grain is utilized for the preparation of a number of industrial by-products including corn oil, corn flakes, custard and glucose. Maize, being a short duration crop, fits well in the existing cropping system and may provide more economic return per unit time to the growers.

Amongst the various factors responsible for the gap between the harvested and potential yield are the lack of adoption of advanced agro-technology and a decrease in the yield potential of existing varieties of maize. The later factor is considered to be the primary cause of low production per unit area. The necessitates substitution of the old maize varieties with new promising hybrids. Present study was, therefore, designed to determine the yield potential and growth behaviour of some new maize genotypes under the irrigated field conditions at Faisalabad.

MATERIALS AND METHODS

The study was conducted at the Agronomic Research Area, University of Agriculture, Faisalabad on a sandy clay loam field during the summer, 1989 following Randomized Complete Block Design with four replications. Net plot size was 3.6 x 8 m. The maize cultivars Neelum, Sunehri, UM-31, Baymesal and Akbar were included in the experiment.

Crop was sown on August 8, 1989 in 90 cm apart double row strips (30-90 cm) with a single row had hand drill using a seed rate of 30 kg ha^{-1} and NP @ 150-100 kg ha^{-1} was applied as urea and diammonium phosphate (DAP), respectively. All of the P and half of the N was applied at the time of sowing, while the remaining half of N was top dressed with second irrigation. The thinning

was done at 4-leaf stage to maintain a plant distance of 30 cm.

The agronomic practices were similar for all the treatments. Crop was harvested on November 17, 1989 from a net plot size of 3.6 x 8 m and sun dried. Cobs were removed from the stalks and unsheathed. Grain yield was recorded after shelling the cobs mechanically by means of a cob-sheller. The data on growth characteristics were collected and analysed statistically by using Fisher's Analysis of Variance Technique. Duncan's New Multiple Range test at 5% level of probability was applied to compare differences among the treatment means (Steel and Torrie, 1980).

on grain weight per cob showed non-significant differences among all the cultivars. Apparently higher grain weight per cob was recorded for Neelum (144.40 g) compared to the lowest of 122.52 g for UM-31 and 123.62 g for Sunehri. These results are quite in line with those of Menzi (1986).

Amongst the various parameters contributing to final yield of a crop, 1000-grain weight is of great importance. The data (Table 1) shows that maize variety Akbar gave significantly less 1000-grain weight (233.0 g) than Neelum, Sunehri and UM-31 but was equal to Baymesal (245.2 g). These differences can be attributed to rainable number of grains/cob in different cultivars

Table 1. Effect of different maize genotypes on the yield and yield components

Treatment	Cob bearing plant/m^2	No. of grain rows/cob	Grain weight per cob	1000-grain weight (g)	Grain yield (q ha^{-1})
Neelum	51.8^{NS}	15.5 ab	144.40^{NS}	262.7 a	40.67 a
Sunehri	5.10	14.0 b	123.62	258.3 a	39.25 a
UM-31	5.06	14.4 b	122.52	262.7 a	36.02 b
Baymesal	5.16	15.1 ab	133.57	245.2 ab	35.41 b
Akbar	5.05	16.0 a	133.72	233.05 b	34.96 b

NS = Non-significant.

RESULTS AND DISCUSSION

The perusal of the data (Table 1) revealed that the number of cobs bearing plants per unit area for different maize cultivars did not vary to a significant extent and ranged from 145.50 to 149.25. The number of grain rows/cob of different cultivars varied significantly. The highest number of grain rows per cob was recorded for Akbar (16.0), followed by Neelum (15.50) and Baymesal (15.1) which were at par with each other. The analysis of variance for the data

under study. The findings are supported by the results of Ahmad *et al.* (1978) and Polerecky (1980). The final grain yield is the formation of the integrated interplay of the various yield components. The grain yield ha^{-1} was significantly affected by maize genotypes (Table 1). Neelum and Sunehri produced significantly higher grain yield than rest of the three cultivars which were statistically equal to one another. The differences between Neelum and Sunehri yields were non-significant. In quantitative terms, Neelum gave the highest grain yield

of 40.67 q ha^{-1} closely followed by Sunchri (39.25), UM-31 (36.02), Baymesal (35.41) and Akbar (34.96). These differences among the cultivars can be attributed to variable behaviour of their yield components. These findings are in conformity with those of Andreev *et al.* (1984), Betancourt (1979) and Lata (1979).

REFERENCES

Ahmad, M., M.A. Mian, M.A. Chaudhry and M. Anwar. 1978. Correlation study in maize. J. Agri. Res. 16: 399-405.

Andreev, A., A. Gancheva, G. Spasor, M. Vasiler, A. Angeler and T.S. Todoror. 1984. Studies on the yield and potential of some maize hybrids in Bulgaria. Rastenior dni Nauki, 24: 17-23. (Maize Abstr.1: 2345; 1985).

Betancourt, J. 1979. Local performance at two periods in the year of maize from other latitudes. Ciencia Y Teenica en La Agricultura, Viandas, Hortalizas Y Granos. 2: 21-36. (Field Crop Abstr. 34: 842; 1981).

Lata, G.S. 1979. Performance of fourteen elites at two locations in suriname. Proc. Caribbean Crops Society, 15: 108-118. (Field Crop Abstr. 34: 158; 1981).

Menzi, M. 1986. New maize cultivars from the swiss variety list. 34: 101. (Field Crop Abstr. 39: 9190; 1986).

Polcrecky, O. 1980. New grain maize hybrids and their yield parameters. Rostlinna Vyroba, 26: 113-141. (Field Crop Abstr. 34: 8916; 1981).

Steel, R.G.D. and J.H. Torrie. 1980. Principles and Procedures of Statistics. McGraw Hill Book Co. Inc., New York, 232-251.