PAK. J. SOIL SCI., VOL. 12 (3-4), 1996

RESPONSE OF MAIZE (*ZEA MAYS* L.) TO NPK APPLICATION UNDER BARANI CONDITIONS

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ABSTRACT

A field study to determine the NPK fertilizer utilization efficiency in maize (Zea mays L.) cv. Sultan was carried out under barani conditions of Chakwal during 1992 and 1993. Seven different fertilizer treatments i.e. 150-0-0, 0-100-0, 0-0-100, 50-100-0, 150-0-100, 0-100-100, 150-100-100 kg ha^{-1} of NPK, respectively were tested against control. Tasseling, silking and maturity periods were delayed significantly by the combined use of NP and NPK fertilizers. Grain yield and yield components like grains Cob^{-1}, 1000-grain weight and harvest index were increased significantly when 150-100-0 and 150-100-100 kg ha^{-1} of NPK were applied.

INTRODUCTION

Maize (*zea mays* L.) is an important cereal used as human food animal feed and as a raw material for various agro-based industries in Pakistan. Application of adequate amount of NPK fertilizer is considered to be very important under our conditions as soils of Pakistan have gone deficient in nitrogen, phosphorus and potash due to continuous cropping. According to economic survey, crop yield could be increased by 40-50 per cent with the use of fertilizer alone (Anonymous 1986). Hussain (1976) stated that tasseling, silking and maturity periods were delayed by nitrogen application while cob weight, 1000-grain weight, stalk and grain yield were increased. Tiwary *et al.*, (1970) observed that the application of NPK fertilizer to maize increased the plant height, number of effective leaves at tasseling, diameter of cobs, number of grains per cob and 1000-grain area and all other yield components also increased by the combined of NP. Rauf and Islam (1983) recorded 2.98 to 5.94 t ha^{-1} of grains of maize cultivar Sadaf with the application of 50-200 kg N, 40-169 kg P_2O_5 and 60 kg K_2O ha^{-1}. Samad (1992) found the highest grain and stalk yield with NPK application @ 150-60-30 kg ha^{-1} which exceeded those of untreated control by 115.9 per cent.

The present study was launched to evaluate the effect of various NPK levels on yield and yield components of maize crop under barani conditions.

MATERIALS AND METHODS

The investigations to determine the response of maize to NPK application under barani conditions were carried out at Barani Agricultural Research Institute, Chakwal during the years 1992 and 1993. The soil was sandy loam with pH 8.2 TSS 0.08 per cent, organic matter 0.68 per cent, N 0.02 per cent and available phosphorus 6.7 mg kg^{-1}. Maize variety Sultan was sown in Randomized Complete Block Design with a net plot size of 10 x 3.6 m. Seven fertilizer treatments i.e. 150-0-0, 0-100-0, 0-0-100, 50-100-0, 150-0-100, 0-100-100 and 150-100-100 kg ha^{-1} of NPK were tested against control. The crop was sown in 90 cm apart paired rows keeping distance of 30 cm between the rows of a pair with the help of single row hand drill by using a seed rate of 26 kg ha^{-1}. The plant to plant distance was maintained as 12-15 cm by thinning. Full dose of phosphorus and potash along with half of nitrogen in the form of single super phosphate (SSP), sulphate of potash (SOP) and