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Influence of integrated nutrient management on productivity and quality of single cross hybrid maize (*Zea mays* L.) cv. HQPM 1

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ABSTRACT : A field experiment was conducted on loamy soil of Centre of Excellence for Research on Maize, Sardarkrushinagar Dantiwada Agricultural University, Bhiloda, Dist. Sabarkantha (Gujarat) to study the influence of integrated nutrient management on productivity and quality of single cross hybrid maize (*Zea mays* L.) cv. HQPM 1 during *Khariif*, 2011. The experiment comprised of twelve treatments in Randomized Block Design with four replications. Among the different treatments of nutrient management, treatment 100 % NPK + farmyard manure @ 5 t ha⁻¹ recorded significantly higher plant height at harvest (228.65 cm), dry matter accumulation at harvest (183.10 g plant⁻¹), weight cob⁻¹ (135.56 g), cob length (18.47 cm), weight of grains cob⁻¹ (99.90 g), shelling percentage (78.60), 1000- grains weight (211.81 g), grain yield (4292 kg ha⁻¹) and stover yield (5647 kg ha⁻¹). Maize crop when fertilized with 100 % NPK + farmyard manure @ 5 t ha⁻¹ observed significantly higher protein (10.43%) and carbohydrate (76.45%) oil per cent (5.49) was observed significantly higher under the application of 100 % NPK + Zn + S over rest of the treatments. The significantly higher nitrogen (329.28 kg ha⁻¹), phosphorus (27.10 kg ha⁻¹) and potassium (309.12 kg ha⁻¹) contents in soil after harvest of maize crop with the application of FYM 10 t ha⁻¹ as compared to other treatments. The highest net return (Rs.39526 ha⁻¹) and BCR (2.56) were recorded with the application of 100 % NPK + farmyard manure @ 5 t ha⁻¹ followed by application of 125 % NPK (Rs.36462 ha⁻¹) along with BCR value of 2.49. The lowest net return (Rs.6578 ha⁻¹) and benefit cost ratio (1.34) were recorded under the control.

Key Words : FYM, Integrated nutrient management, Maize, Seed yield, Net return

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Maize (*Zea mays* L.) is an annual plant which belongs to family Gramineae and Genus *Zea*. (*Zea mays* L.) In fact the suitability of maize to diverse environments is unmatched by any other crop. It is grown from 58°N to 40°S, from below sea level to altitudes higher than 3000 m, and in areas with 250 mm to more than 5000 mm of rainfall per year (Shaw, 1988; Dowsell *et al.*, 1996) and with a growing cycle ranging from 3 to 13 months (CIMMYT, 2000). However, the major maize production areas are located in temperate regions of the globe.

Maize is considered as the “queen of cereals”. Being a C₄ plant, it is capable to utilize solar radiation more efficiently even at higher radiation intensity. The nutritional quality of maize is determined by the amino acid makeup of its protein. Maize is deficient in two essential amino acids: lysine and

tryptophan, making it a poor protein food. Integrated nutrient management (INM) is a flexible approach to minimize the use of chemical sources of nutrients along with maximization of their efficiency and farmer's profit. Fertilizers, organic manures and biofertilizer are the main component of INM. The quality parameters of maize like sugar, starch and crude protein content increase by continuous application of NPK + FYM. No manuring, lack of K and use of S free fertilizers decrease these parameters (Singaram and Kumari, 1999). Protein content of maize increases significantly with increase in use of sulphur (Dwivedi *et al.*, 2002). Farm yard manure application to the crops is being practiced for long period. Well decomposed FYM in addition to supplying plant nutrients acts as binding material and improves the soil physical properties (Kale and Bano, 1988).