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Influence of phosphorus levels with and without PSB on growth and yield of rainfed sunflower

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ABSTRACT

An experiment was conducted during *Kharif* season of 2006-07 at Agronomy Farm, College of Agriculture, Latur (M.S.) to study the effect of phosphorus levels with and without PSB on growth attributes and yield of sunflower. Nine treatments were tested in randomized block design with three replications. The experimental results revealed that the treatments application of 80 kg P_2O_5 ha^{-1} with and without PSB and application of 60 kg P_2O_5 ha^{-1} with and without PSB recorded significantly maximum growth attributes *viz.*, plant height, number of functional leaves plant^{-1}, leaf area plant^{-1} (cm^2), total dry matter plant^{-1} (g), stem girth (cm), head diameter and yield parameters *viz.*, yield plant^{-1} (g), seed yield ha^{-1}, stalk yield ha^{-1}, dry weight of capitulum ha^{-1} and harvest index over rest of the treatments, respectively. However, control treatment recorded lowest yield attributes, yield and quality parameters of sunflower.

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Key words : Rainfed sunflower, Phosphorus levels, PSB

INTRODUCTION

Sunflower is an important oilseed crop of Maharashtra under rainfed situation particularly in vertisols. The productivity of sunflower is very low 560 kg ha^{-1} in Maharashtra (Anonymous, 2010). Of the many reason of low productivity, nutrient management especially phosphorous management is one of the key factors enhancing the oil content as well as productivity of sunflower (Patil *et al.*, 2004). In view of escalating prices and high demand supply gap of chemical fertilizers, there is strong need to adopt judicious combination of inorganic with organic ones, more particularly biofertilizers of microbial origin to improve the soil health and productivity. Hence, the present study was undertaken to know the response of PSB alone and the combination with various phosphorous levels on productivity and quality of sunflower.

MATERIALS AND METHODS

A field experiment was conducted to study the effect of phosphorus levels with and without PSB on growth attributes and yield of sunflower during *Kharif* season of 2006-07 at Agronomy Farm, College of Agriculture, Latur (M.S.), India in Randomized Block Design with nine treatments replicated thrice. The treatments were T_1- Control, T_2-20 kg P_2O_5 ha^{-1}, T_3-20 kg P_2O_5 ha^{-1} with PSB, T_4- 40 kg P_2O_5 ha^{-1}, T_5-40 kg P_2O_5 ha^{-1} with PSB, T_6- 60 kg P_2O_5 ha^{-1}, T_7-60 kg P_2O_5 ha^{-1} with PSB, T_8-80 kg P_2O_5 ha^{-1} and T_9-80 kg P_2O_5 ha^{-1} with PSB. The experimental soil was deep black in colour with good drainage, pH (8.0), low in available nitrogen (187 kg ha^{-1}), medium in phosphorus (20.12 kg ha^{-1}) and rich in available potassium (695 kg ha^{-1}). Variety LSF-8 was sown by dibbling with row spacing of 45x20 cm^2 on 2nd Aug., 2006. Fertilizer dose applied as per treatments. Crop was harvested on 12th Nov., 2006. The total rainfall received during crop season was 619mm in 27 rainy days.

RESULTS AND DISCUSSION

The data pertaining to growth attributes and yield of sunflower are given in Table 1 and 2. Treatment T_9 registered significantly maximum growth attributes *viz.*, plant height (141.84 cm), leaf area plant^{-1} (29.00 cm^2), total dry matter plant^{-1} (59.31 g) and head diameter plant^{-1} (15.28 cm) over rest of the treatments. Treatments T_8, T_7 and T_6 were at par with treatment T_9 in respect of plant height (140.20, 139.23 and 138.52 cm), leaf area plant^{-1} (28.20, 27.82 and 27.18 cm^2) and head diameter (15.13, 14.92 and 14.79 cm), respectively. However, treatment T_1 registered lowest all the growth attributes. Similar results were also reported by Sharma (1994) and Patil *et al.* (2004). As regards yield parameters, same treatment *i.e.* treatment T_9 recorded significantly

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