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Effect of crop geometry, weed management practices and nutrient levels on performance of rainfed sunflower (*Helianthus annuus* L.)

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ABSTRACT

The present investigation was conducted during *Rabi* season of 2003 and 2004 at Agricultural Research Station, Podalakur (Nellore district) of Andhra Pradesh to find out appropriate crop geometry, optimum nutrient level, efficient weed control method for rainfed sunflower on vertisols. From the investigation it was revealed that sowing of sunflower at a spacing of 60 x 30 cm along with the pre-emergence application of pendimethalin + one intercultivation at 25 DAS and application of 125 per cent recommended dose of nutrients (100 kg N, 62.5 kg P_2O_5 and 37.5 kg K_2O ha^{-1}) was found to be the best package of agro-techniques for rainfed sunflower on vertisols of Southern Agro-climatic zone of Andhra Pradesh, for realizing higher productivity and economic returns.

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Key words : Sunflower, Crop geometry, Weed control methods, Nutrient levels

INTRODUCTION

Dry land agriculture is beset with an array of problems, the paramount of them being the vagories of monsoon, which is most undependable, both in quantity and time and thus it dictates the success or failure of crop production. In Nellore district of Southern Agro-climatic Zone of Andhra Pradesh, Black gram is the principal crop of rained areas during *Rabi* season. Inconsistent and erratic behaviour of North-East monsoon has been resulting in unremunerative productivity of Black gram in this region. To overcome this climatic constraint, several alternate crops *viz.*, redgram, jowar, horse gram, bengal gram, soybean and sunflower were tested and found to be more remunerative compared to black gram. Among the alternate crops tried, sunflower was more promising for this region. Sunflower (*Helianthus annuus*) is a versatile edible oil seed crop having several inherent advantages like wide adaptation to different soil types and seasons, good seed multiplication ratio, photo–insensitivity and yields fine quality of edible oil. Because of these advantages, sunflower is becoming a preferred crop, mostly, under rainfed farming by small and marginal farmers.

In Andhra Pradesh, sunflower is cultivated in 4.9 lakh ha of area with a production of 3.3 lakh tones, the productivity being 679 kg ha^{-1} (Plant doctor's diary, 2005). In the backdrop of the above, there is immense need to enhance the productivity of sunflower, to contribute to the oilseed economy of the country. Such uphill task is undisputedly on the shoulders of agronomists, who have to exploit the potential of modern genotypes by evolving appropriate agrotechniques suitable to the agroclimatic regions.

Growth of the sunflower crop varies with the planting pattern, resulting in variation of the plant stature and canopy coverage. In this context, the arrangement of plants *i.e.*, crop geometry is likely to play an important role, which makes it necessary to find out suitable planting geometry. Similarly, mineral nutrition plays a significant role in influencing the productivity of sunflower, which makes it imperative to identify the optimum dose of nutrients. Added to this, the occurrence of weeds during the early stages of crop growth, a universal phenomenon in rainfed areas, results in huge yield loss of sunflower. Hence, it is essential to find out a proper method of weed control in this crop. In light of the above, the present investigation was planned to find out appropriate crop geometry, optimum nutrient level, efficient weed control method for rainfed sunflower on vertisols of Southern Agro-climatic Zone of Andhra Pradesh.

MATERIALS AND METHODS

The present investigation was conducted during *Rabi* season of 2003 and 2004 at Agricultural Research Station, Podalakur (Nellore district) of Andhra Pradesh. The soil samples were composited for each season separately and analyzed for different physico-chemical properties. The soil was clay in texture, alkaline in reaction (pH 8.4), low in organic carbon (0.27 %) and available nitrogen (163 kg N ha^{-1}), medium in available phosphorus (22. 2 kg P_2O_5

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