

Effect of integrated nutrient management practices on seed yield and quality characters of sunflower (*Helianthus annus L.*)

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ABSTRACT

The field experiment was conducted at the Experimental Farm, Annamalai University, Annamalai Nagar, Tamil Nadu during August 2002 to study the effect of different sources of nutrients viz., organic, inorganic, biofertilizers and growth hormones on the seed yield and quality of sunflower. Among the treatments tried, maximum seed yield (1243 kg ha⁻¹) was obtained with plots received combined application of recommended NPK (40:20:20kg ha⁻¹) + vermicompost @ 5 t ha⁻¹ + Azospirillum @ 2 kg ha⁻¹ (soil application) + ZnSo₄ @ 25 kg ha⁻¹ + Foliar spray of 1% KH₂PO₄ (T₁₀). The enhanced seed yield was attributed to increased head diameter, seed set percentage and test weight. This treatment also registered maximum values for oil and protein contents.

Key words : Sunflower, Integrated nutrient management, Seed yield, Quality characters.

INTRODUCTION

Sunflower is one of the most important annual crops in the world grown for edible oil. It occupies second place after soybean as a source of vegetable edible oil. Of all the oilseed crops, sunflower is gaining popularity in the recent past because of its excellent quality oil owing to its richness with high degree polyunsaturated fatty acids (PUFA) and anti-cholesterol properties. Despite its remunerative nature, sunflower is said to be an exhaustive crop. Even though the area under sunflower crop is increasing, the productivity is not keeping pace with that. Among several reasons attributable to low productivity, the inadequate and imbalanced nutrition of essential nutrients can be considered as a major one. Fertilizer application is the major input through which the productivity can be increased by exploiting varietal potential. Chemical fertilizers have had a substantial impact on yield increments in the recent past, and are today an indispensable part of modern agricultural practices (Reddy and Raja Reddy 2002). Integration of organic manures and biofertilizers with chemical fertilizers is more emphasised not only to boost the production of sunflower from limited land resource but also for its sustainability. There is need to promote use of organics in addition to inorganic fertilizers for sustained maintenance of soil fertility (Devidayal and Agarwal 1999). Keeping these facts in view, the present investigation was carried out for identifying suitable nutrient management practices for getting higher yield of sunflower with better quality oil and protein.

MATERIALS AND METHODS

A field experiment was conducted to study the effect of Integrated Nutrient Management (INM) on sunflower during August 2002, at Experimental Farm, Department of Agronomy, Annamalai University, Annamalai Nagar. The soil of experimental field was clayey loam with low in available Nitrogen (212.4 kg ha⁻¹), medium in available Phosphorus (28.3kg ha⁻¹) and high in available Potassium (348.1kg ha⁻¹). The pH and EC were 7.5 and 0.45 dsm⁻¹, respectively. The experiment was laid out in a simple randomized block design with ten treatments and replicated thrice. Treatments comprised of different combinations of organic manures, biofertilizers with inorganic fertilizers and growth hormones; which were as follows:

- T₁-No NPK/organics (control),
- T₂-Recommended dose of fertilizer (RDF). (40 : 20: 20 kg ha⁻¹),
- T₃-T₂ + Farm yard manure (FYM) @ 12.5 t ha⁻¹,
- T₄-T₂+ vermicompost @ 5 t ha⁻¹,
- T₅-T₃ + Azospirillum @ 2kg ha⁻¹ (soil application),
- T₆-T₄ + Azospirillum 2 kg ha⁻¹,
- T₇-T₅ + ZnSo₄ @ 25 kg ha⁻¹ (soil application),
- T₈-T₆ + ZnSo₄ @ 25 kg ha⁻¹,
- T₉-T₇+ Foliar spray of 1% KH₂PO₄ at ray floret stage,
- T₁₀-T₈ + 1% KH₂PO₄.

The vermicompost used in the study was obtained from M.R.Krishnamoorthy Sugar mill, Sethiathope, Chidambaram Taluk. It contains 1.70% N, 1.48% P₂O₅

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