

Research Paper :

Effect of nutrient management on productivity of sesame and soil fertility of sandy loam soils under rainfed condition

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ABSTRACT

A field experiment was conducted at Dry Farming Research Station, Nana Kandhasar (Gujarat) during *Kharif* 1999-2007 to study the effect of nutrient management (including chemical fertilizer, FYM and biofertilizers) on sesame yield and post harvest soil fertility in sandy loam soils under rainfed condition. Maximum grain yields as well as net realization were recorded under application of NP @ 25:25 kg ha⁻¹ along with FYM 5 t ha⁻¹. Integration of inorganic and organic sources was positively influenced the availability of various plant nutrients in the soil.

Key words : INM, Sesame, Yield, Economic, Soil fertility

Awareness of environmental aspects of soil quality and crop production has been increasing in recent years which have led to the renewed interest in recycling of crop residues and other organic manures as source of nutrients for crop. The use of chemical fertilizers can not be ruled out completely, there is a need for integrated application of alternate source of nutrient for sustaining soil productivity (Tiwari, 2002). Biofertilizers are low cost and eco-friendly input have tremendous potential for supplying nutrients. The supplementary and complementary use of organic manures and chemical fertilizers augment the efficiency of both the substances to maintain a high level of soil productivity (Ghuman and Sur, 2006). Attempts have been made through the present investigation to study the effect of nutrient management on sesame yield and post harvest soil fertility in sandy loam soils.

MATERIALS AND METHODS

A field experiment was conducted at Dry Farming Research Station, Nana Kandhasar (Gujarat) during *Kharif* 1999-2007 to study the effect of nutrient management including chemical fertilizer, FYM and bio fertilizer on yield of sesame and post harvest fertility of sandy loam soils under rain fed condition with three replications in randomized block design. The experiment comprising of total nine treatments involving: T₁- Absolute control, T₂- NP Fertilization (25:25 kg ha⁻¹), T₃- FYM 5 t ha⁻¹ + NP Fertilization (25:25 kg ha⁻¹), T₄- FYM 5 t ha⁻¹ + 50 % NP fertilization, T₅- T₄ + 20 kg S ha⁻¹ through gypsum, T₆- T₄ + PSM + *Azotobacter* inoculation (625 g

ha⁻¹), T₇- T₄ + deficient nutrient application (ZnSO₄ 8 kg t ha⁻¹), T₈- FYM 5 t ha⁻¹, T₉- FYM 5 t ha⁻¹ + green leaf manure looping (5 t ha⁻¹) + PSM (625 g ha⁻¹) + *Azotobacter* (625 g ha⁻¹)

Soil samples were collected from each plot after harvesting of crop (2007) to determine the nutrient status of the soils. The samples were prepared for determination of different nutrients accordingly and analyzed using standard procedure as described by Jackson (1973).

RESULTS AND DISCUSSION

The results obtained from the present investigation have been discussed in the following sub heads :

Yield :

Grain yield of sesame was significantly affected due to different treatments during all the years (except 1999) of experimentation as well as in pooled results (Table 1). On the basis of pooled results, all the treatments of nutrient management (except T₀) found significantly superior over absolute control (T₁). Application of FYM 5 t ha⁻¹ + NP (25:25 kg ha⁻¹) fertilization (T₃), being at par with FYM 5 t ha⁻¹ + NP fertilization (12.5:12.5 kg ha⁻¹) + PSM + *Azotobacter* inoculation (T₆) and FYM 5 t ha⁻¹ + NP fertilization (12.5:12.5 kg ha⁻¹) + deficient nutrient (ZnSO₄ 8 kg ha⁻¹ (T₇), produced maximum grain yield (508 kg ha⁻¹), which was higher by 90.97 per cent as compared to absolute control (T₁). Application of FYM 5 t ha⁻¹ + NP fertilization (12.5:12.5 kg ha⁻¹) + PSM + *Azotobacter* inoculation (T₆) and FYM 5 t ha⁻¹ + NP fertilization (12.5:12.5 kg ha⁻¹) + deficient nutrient ZnSO₄ 8 kg ha⁻¹