

Research Paper :

Effect of inorganic and biofertilizers on soil physico chemical properties and micronutrient availability in strawberry (*Fragaria × ananassa* Duch)

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ABSTRACT

The experiment was conducted during 2005-2006 at Sher-e-Kashmir University of Agricultural sciences and Technology of Kashmir India to study the combined effect of nitrogen (0,75,150 Kg ha⁻¹), phosphorus (0,50,100 kg ha⁻¹) and bio-fertilizers (No inoculant, *Azotobacter* sp., *Bacillus* sp., *Pseudomonas* sp., *Glomus* sp.) on soil physicochemical properties and micro nutrient availability in strawberry growing soils. The experiment was laid out in completely randomized design (factorial) with 45 treatment combinations and 5 replications. Significantly lower pH (6.44) from T₁₇, T₁₉, T₃₃, electrical conductivity (0.62 dsm⁻¹) from T₃ and higher organic carbon (0.97%) from T₂₈, T₃₈ and T₄₂ were recorded. Zinc availability was not significantly influenced by any treatment. Treatments T₄₃ and T₄₄ recorded significantly higher available copper content (0.85 ppm). Significantly higher available manganese (50.20ppm) and iron (45.01ppm) was recorded from the treatment T₄₄.

Key words : Inorganic fertilizers, Biofertilizers, Micronutrients, Strawberry

Strawberry (*Fragaria × ananassa* Duch) is one of the most popular soft fruits cultivated in plains as well as in the hills up to an elevation of 3000 m in humid or dry regions (Singh *et al.*, 2008). In India it is being widely cultivated in Maharashtra, Punjab, Haryana, Himachal Pradesh, Jammu and Kashmir and hills of west Bengal with Maharastra as the leading state in its production. Being bestowed with a wide range of agroclimatic conditions, Jammu and Kashmir offers immense potentiality for growing strawberry. The rich fertile soils and well distributed rainfall favours the cultivation of strawberry in this state. Strawberry being a shallow rooted plant need effective nutrient management. The application of fertilizers have a major role for harnessing optimum yield per unit area. At present the inorganic fertilizers are not only in short supply but expensive too. Their regular, excessive and unbalanced use may lead to health and ecological hazards, degradation of soil physicochemical properties and ultimately poor crop yields. Hence, there is a need to think of alternative source of fertilizers. Application of biofertilizers seems to be a ray of hope in this direction. These help in fixing and solubilizing or providing access to various macro and micronutrients. Therefore, use of biofertilizers in combination with inorganic fertilizers is of paramount importance so that the local rhizosphere micro flora can be exploited for commercial strawberry production. Absolutely no such work has been done so far in this region. Keeping in view the importance, the present

investigation was undertaken to study the effect of locally isolated, identified and screened beneficial rhizosphere microflora in combination with inorganic fertilizers on soil physicochemical properties and micro nutrient availability.

MATERIALS AND METHODS

The present experiment was carried out in the poly house of Division of Soil Science, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, India, during the year 2005-2006. Strawberry (*Fragaria × ananassa* Duch) cv. SENG SENGANA was used as experimental plant. Soil for filling the pots was collected from fallow field where no pesticide had been used. The experimental soil was having pH 6.9, electrical conductivity 0.65 dsm⁻¹, organic carbon 0.76 per cent, available nitrogen, phosphorus, potassium, Zinc, Copper, manganese and iron of 99.2 kg ha⁻¹, 10.18 Kg ha⁻¹, 212.16 Kg ha⁻¹, 0.80 ppm, 0.71 ppm, 40.13 ppm and 42.91 ppm, respectively, while as bacterial, fungal and VAM population was 72 × 10⁶ CFU g⁻¹ soil, 45 × 10³ CFU g⁻¹ soil and 5 spores g⁻¹ soil, respectively. *Azotobacter* sp., *Bacillus* sp. and *Pseudomonas* sp. were isolated from the strawberry rhizosphere by dilution plate counting technique using Ashby's medium, King's B medium and Pikovaskya medium, respectively. *Glomus* sp. spores were isolated by wet sieving and decanting method (Gerdemann and Nicolson, 1963). The bacterial strains were identified and screened as per Bergey's Manual