

Influence of integrated plant nutrient supply on physical and biological properties of soil and yield of okra (*Abelmoschus esculents* L. Monech)

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ABSTRACT

A field experiment was conducted during 2001-02 at the Central Campus, Mathama Phule Krishi Vidyapeeth, Rahuri to study the influence of integrated plant nutrient supply (IPNS) on Physical and biological properties of soil and yield of okra. (cv. ARKA ANAMIKA). The experiment was laid out in randomized block design and replicated thrice. The results of this study indicated that application of fertilizers along with organic manures and biofertilizers improved the physical and biological properties of soil and thereby enhancing the yield of okra. Addition of organic sources *i.e.* farm yard manure and spent wash press mud compost, both showed significant improvement in soil physical properties like pore space, improvement in soil structure, decrease in bulk density and increase in water holding capacity. The soil microbial and faunal feeding activity responded to compost amendments with higher activity rates than with mineral fertilization. Increased microbial population directly enhanced nutrient uptake capacity of crop. There was significant increase in microbial population along with the use of organic manures and biofertilizers.

Key words : Okra, NPK, FYM, SW-PWC, IPNS, Yield, Photosphere.

Ookra (*Abelmoschus esculents* L. Monech) commonly known as Lady's finger or Bhendi is an annual vegetable crop, because of its year round cultivation, export, import and high nutritive value, it has captured prominent place among vegetables grown in India.

The use of organic manures in crop production is known from time immemorial. The application of organic manure has shown beneficial effect on physical properties of soil. It improves the structure of the soil. Nimje and Seth (1970) reported that application of both phosphorus and FYM significantly decreased bulk density of soil. The effect of FYM was much more pronounced but nitrogen application had no effect. This effect may be due to better root development of crop. Increased organic carbon content increases the activity of gum producing soil micro-organisms. Addition of FYM improved the structure of soil and thereby enhanced water holding capacity of soil. Kumar and Tripathi (1990) studied the effect of continuous manuring and fertilizers on physical properties of soil under paddy, wheat and cowpea cropping system. They reported that hydraulic conductivity of fallow plot was higher by 1.5 to 6 times than cultivated plot. Infiltration rate of fallow plot is also higher. Organic manures increased infiltration rate than NPK applied alone.

The organic compound present in soil influence the growth of plants in number ways. Organic acid liberated during decomposition process increase the availability of

insoluble phosphates and metallic trace elements. The organic manure in general encourage the growth of saprophytic micro-organisms in soil and reduce the population of pathogen.

Case of yield of okra, it is revealed that application of organic manures in combination with inorganic fertilizer and biofertilizers proved to obtain better yield.

Keeping such aspects in mind the present investigation was undertaken to study the influence of Integrated Plant Nutrient Supply (IPNS) on physical and biological properties of soil and yield of okra.

MATERIALS AND METHODS

A field experiment was carried out during summer season of 2002 at post graduate Institute research farm of the department of soil science and Agriculture Chemistry, Mahatma Phule Krishi Vidyapeeth, Rahuri. Experimental field soil was clay in texture, with slightly alkaline in reaction (7.51) and electrical conductivity of the soil was 0.43 dSm⁻¹. The fertility status of the soil was low in nitrogen (210 kg ha⁻¹), moderately high in available phosphours (27 kg ha⁻¹) and higher in available potassium (257 kg ha⁻¹). The soil was moderately high status in organic carbon content (0.60%). The treatments were laid in randomized block design and replicated thrice. The treatments were,

- T₁ : Absolute control,
- T₂ : 100 : 50 : 50 kg ha⁻¹ NPK (Recommended dose),
- T₃ : NPK (100 : 50 : 50 Kg ha⁻¹) + 10 Mgha⁻¹ FYM,
- T₄ : NPK (100 : 50 : 50 kg ha⁻¹) + 10 Mgha⁻¹