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NOTE

Integrated Effect of Biofertilizers and Organic Manure on Turmeric (*Curcuma longa*)

S. C. MOHAPATRA AND T. K. DAS

Krishi Vigyan Kendra, Orissa University of Agriculture & Technology
Sonepur, Orissa 767017, India

Abstract

In sustainable farming organic manure and biofertilizers play an important role through improvement in soil fertility and crop productivity. Free living nitrogen fixing bacteria *Azospirillum* and phosphate solubilizing bacteria (PSB) have been used as biofertilizer to increase the availability of N and P respectively. The activity of soil microbs may further be enhanced by use of organic manure. The farm yard manure (FYM) is one of the important organic manure oftenly used by the farmers. Turmeric is an traditional spice crop of rainfed western Orissa, it is also used in aromatic and medicinal purpose, so organically cultivated turmeric has great significance. Hence a field assessment was done to find the combined effect of biofertilizers and FYM on turmeric (*Curcuma longa*) production in rainfed situations.
Key words : Biofertilizer, Organic manure, Turmeric.

An investigation was carried out at Krishi Vigyan Kendra (OUAT), Sonepur, Subarnapur during 2006-07 and 2007-08 to assess the effect of FYM and seed rhizome inoculation of *Azospirillum* and PSB on turmeric (Variety Surama). The soil was silty loam having pH 6.8 and low in organic carbon status and total nitrogen (0.041%), available phosphorus (14.6 kg/ha) and available potassium (178 kg/ha). A total of eight treatment combination were arranged in randomized block design with three replications. The uniform mother rhizomes were planted in raised bed using a seed rate of 20 q/ha at spacing of 25 × 25 cm in second week of June during both the years. All other cultural practices of turmeric cultivation were adopted based on recommendation without any chemicals.

The significant improvement in yield of turmeric due to FYM (10 t/ha) application could be ascribed to its favorable effect as physical, biological and chemical properties of soil (Table 1). Seed rhizome inoculation at 25 g culture per 10 kg rhizome with *Azospirillum* alone and combination with PSB significantly increased the yield to the extent of 6–7%. The result was in close agreement with the observation of Khun et al. (1989). However, PSB inoculation did not show any significant variation in yield. Further, rhizome yield of turmeric was influenced by combined effect of biofertilizers and FYM. The maximum raw rhizome yield (108.4 q/ha) was recorded with combined effect of FYM (10 t/ha) and dual inoculation followed by *Azospirillum* inoculation alone under the influence of FYM. The yield under the treatment combination was significantly higher over their individual effect and differences among biofertilizers without FYM were not significant. It indicates that the beneficial effect of biofertilizer was increased with FYM application (Somani et al. 1990).

Table 1. Effect of biofertilizers and FYM on rhizome yield of turmeric (two year mean data, 2006-07 and 2007-08). AZO = *Azospirillum* culture inoculation at 25 g culture per 10 kg seed rhizome. PSB= Phosphorus solubilizing bacteria culture inoculation at 25 g culture per 10 kg seed rhizome. Dual = Both *Azospirillum* and PSB culture inoculation at 25 g each per 10 kg seed rhizome. FYM = Farm yard manure (10 t/ha).

Treatments	Treatment combination	Rhizome yield (q/ha)
1	AZO	94.5
2	PSB	92.8
3	Dual	95.7
4	FYM	96.3
5	FYM + AZO	106.3
6	FYM + PSB	102.6
7	FYM +Dual	108.4
8	Control	89.2
	CD (0.05%)	4.2

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