

Influence of organic manures and inorganic fertilizers on cured rhizome yield and quality of turmeric (*Curcuma longa* L.) cv. BSR-2

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ABSTRACT

Turmeric an important rhizomatous spice is widely cultivated in Tamil Nadu. A study was conducted to assess the effect of organic manures and inorganic manures on growth, yield, cured rhizome yield and quality of turmeric. Highest plant height (95.12 cm), number of leaves (20.62), number of tillers (4.32) was recorded in the treatment farmyard manure + azospirillum + phosphobacteria + VAM (M_1S_7). Among the treatment, the greatest curing percentage and cured rhizome yield (21.26, 7080.17 kg ha⁻¹) was documented in the application of farmyard manure + azospirillum + phosphobacteria + VAM (M_1S_7). The lowest cured rhizome yield (3479.85 kg ha⁻¹) was recorded under the application of 50 per cent recommended dose of fertilizer alone without any inoculation of biofertilizers (M_4S_8). Among the treatment combinations, higher content of curcumin and oleoresin (4.577 and 9.477) was recorded under the application of farmyard manure + azospirillum + phosphobacteria + VAM (M_1S_7). The highest essential content (3.817 per cent) was recorded under the application of vermicompost + azospirillum + phosphobacteria + VAM (M_2S_7).

Key words : Biofertilizers, Curing percentage, Curcumin, Essential oil, Oleoresin.

INTRODUCTION

India is the largest, monopoly producer and traditional exporter of turmeric in the world. Area and production of turmeric in the country showed increasing trends during the last five years. The highest area (1.89 lakh hectare), production (7.98 lakh tonnes) and productivity (5760 kg ha⁻¹) was recorded in 2005-2006 contributing 85.6 per cent of production and 4.12 per cent of export, earning a foreign exchange of 88 crores annually. In India, turmeric is cultivated mainly in Tamilnadu, Andhra Pradesh, Kerala, Karnataka, Orissa etc. In Tamil Nadu it is restricted to Erode, Salem, Nammakkal, Perambalur, Villupuram and Coimbatore districts. Organically grown products fetch higher price than ordinary packed food items. There is great demand for the organically grown produce in Western countries. So far a limited work has been standardised for organic farming practice more specially in spice like turmeric. Hence the study was aimed in studying improving the growth, yield, curing percentage and quality of turmeric.

MATERIALS AND METHODS

Experiment was conducted at College Orchard, department of spice and plantation crops, Coimbatore. Experiment was laid in split plot design with three replications.

Main plot treatments :

- M_1 - Farmyard manure (30 t ha⁻¹)
- M_2 - Vermicompost (10 t ha⁻¹)
- M_3 - Digested coirpith compost (10 t ha⁻¹)
- M_4 - 50 per cent of recommended dose of fertilizer (62.5:30:45 kg N, P₂O₅, K₂O ha⁻¹)

Sub plot treatments :

- S_1 - Azospirillum (10 kg ha⁻¹)
- S_2 - Phosphobacteria (10 kg ha⁻¹)
- S_3 - VAM (500 kg ha⁻¹)
- S_4 - Azospirillum (10 kg ha⁻¹) + Phosphobacteria (10 kg ha⁻¹)
- S_5 - Azospirillum (10 kg ha⁻¹) + VAM (500 kg ha⁻¹)
- S_6 - Phosphobacteria (10 kg ha⁻¹) + VAM (500 kg ha⁻¹)
- S_7 - Azospirillum (10 kg ha⁻¹) + Phosphobacteria (10 kg ha⁻¹) + VAM (500 kg ha⁻¹)
- S_8 - Control (without any inoculation of biofertilizers)

The inoculants of Azospirillum (*Azospirillum lipoferum*), Phosphobacteria (*Bacillus megatherium*) and VAM (Vermiculite based inoculums containing *Glomus fasciculatum*, *G.mossae* and *Gigaspora sp.*) were used. Recommended dose of farmyard manure (30 t ha⁻¹), digested coirpith compost (10 t ha⁻¹) and the vermicompost (5 t ha⁻¹) were applied basally during the last ploughing.

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