

STUDIES ON THE EFFECT OF ORGANIC MANURES AND BIOFERTILIZERS ON RHIZOME YIELD AND ITS ATTRIBUTES OF TURMERIC cv. BSR-2

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ABSTRACT

The investigation on turmeric (*Curcuma longa* L.) was carried out to study the effect of different organic manures and biofertilizers on turmeric with reference to rhizome yield and its attributes. The study revealed that, turmeric showed better response to the application of organic manures and biofertilizers. The combined application of farmyard manure along with azospirillum + phosphobacteria + VAM (M1S7) recorded the supremacy for yield attributes like more number of mother rhizomes per plant⁻¹ (3.98), more number of primary rhizomes per plant⁻¹ (13.19) and secondary rhizomes per plant⁻¹ (19.89). Similarly the same treatment expressed the best in terms of lengthier mother rhizome (5.32 cm), primary rhizome (10.90 cm) and secondary rhizomes (2.40 cm). More girth of mother rhizome (3.85 cm), primary rhizomes (2.50 cm) and secondary rhizomes (1.44 cm) was noticed in the same treatment combinations. The higher weight of mother rhizomes (0.200 kg plant⁻¹), primary rhizome (0.453 kg plant⁻¹) and secondary rhizome (0.185 kg plant⁻¹) was excelled by the same treatment combinations. All these parameters in cumulative produced greater yield plant⁻¹ (0.838 kg), yield plot⁻¹ (33.50 kg) and highest estimated yield of 33313.00 kg ha⁻¹.

Key words : Turmeric, Rhizome, Yield attributes.

Turmeric (*Curcuma longa* L.) an herbaceous perennial belonging to the family Zingiberaceae grows with tufted leaves. It is a sacred, auspicious, dual-purpose spice for Asian countries valued for its food adjunct property and also a source of safe natural colouring agent required by pharmaceutical, confectionary and cosmetic industry. Turmeric being a rhizomatous crop requires a heavy input of fertilizers. Owing to the high cost of fertilizers and sustainable soil management, demanded the organic farming in turmeric (Balashanmugam, 1994). In addition to this, there is a great demand for the organically grown produce in Western countries. So far a limited work has been standardized for organic farming practice more specially in spice like turmeric. Hence the study was intended in standardization of organic manure and biofertilizers on yield and its attributes in turmeric cv BSR-2.

MATERIALS AND METHODS

The experiment was conducted at college orchard, Department of Spice and Plantation Crops, Coimbatore. Experiment was laid in split plot design with three replications. The main plot treatments are M₁-Farmyard manure (30 t ha⁻¹), M₂-Vermicompost (10 t ha⁻¹), M₃-Digested coirpith compost (10 t ha⁻¹) and M₄-50 per cent

of recommended dose of fertilizer (62.5:30:45 kg N, P₂O₅, K₂O ha⁻¹) and sub plot treatment are S₁-Azospirillum (10 kg ha⁻¹), S₂-Phosphobacteria (10 kg ha⁻¹), S₃-VAM (500 kg ha⁻¹), S₄-Azospirillum (10 kg ha⁻¹) + Phosphobacteria (10 kg ha⁻¹), S₅-Azospirillum (10 kg ha⁻¹) + VAM (500 kg ha⁻¹), S₆-Phosphobacteria (10 kg ha⁻¹) + VAM (500 kg ha⁻¹), S₇-Azospirillum (10 kg ha⁻¹) + Phosphobacteria (10 kg ha⁻¹) + VAM (500 kg ha⁻¹) and S₈-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. The remaining quantity (5 t ha⁻¹) was applied in soil 90 days after of planting and soil was ragged for better mixing. Primary rhizomes of uniform size were selected and adequate quantity of carbohydrate solution (rice gruel) was added with azospirillum and phosphobacteria inoculum separately at the rate of 10 kg ha⁻¹. Then the rhizomes were spread and dried in shade for 30 minutes and the rhizomes were planted at the sides of ridges in the respective plots at a spacing of 45 x 15 cm. The VAM was applied immediately after planting. The untreated rhizomes were planted to serve as control. Calculated