



Effect of organic, inorganic and bio-fertilizer *Azospirillum* on yield and yield attributing characters of turmeric (*Curcuma longa* L.) cv. RAJENDRA SONIA

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ABSTRACT

The investigation on turmeric (*Curcuma longa* L.) was carried out to study the effect of organic, inorganic manure 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, inorganic and bio-fertilizer. The combined application of inorganic N (100%) + *Azospirillum* + FYM 5t ha⁻¹ recorded the supremacy for yield attributes like more height of the plant (119.38cm), more number of tillers per plant (6.11), more number leaves per tiller (12.76), more yield (56.61t ha⁻¹) and more cost : benefit ratio Rs.5.27 per unit cost (1:5.27) as compared to control and other treatments.

Singh, S.P. (2011). Effect of organic, inorganic and bio-fertilizer *Azospirillum* on yield and yield attributing characters of turmeric (*Curcuma longa* L.) cv. RAJENDRA SONIA, *Asian J. Hort.*, 6 (1) : 16-18.

Key words : Turmeric (*Curcuma longa* L.), Bio-fertilizers, *Azospirillum*, Growth, Yield

Turmeric (*Curcuma longa* L.) is grown over a wide range of latitudes and its cultivation is widely distributed geographically. Turmeric 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. Intensive crop cultivation requires the supplementation of chemical fertilizer with natural bio-fertilizers as they are most effective, eco-friendly and highly efficient input to produce safer food for consumption. In recent years, *Azospirillum* have gained importance because of their N₂ fixing capacity in root of different crop like-cereals, vegetable and spices. *Azospirillum* spp. are also known to produce growth regulators like IAA, IBA, NAA, GA₁, GA₃, Vitamins etc. besides providing nitrogen in readily available form. So far a limited work has been standardized for organic, inorganic and bio-fertilizers farming practices more specially in spices like turmeric. Hence, the study was intended in standardization of organic, inorganic and bio-fertilizers on yield and its attributes in turmeric variety Rajendra Sonia.

MATERIALS AND METHODS

The experiment was conducted three consecutive

year from 2007- 08 to 2009-2010 at experimental plot of Horticulture, Tirhut College of Agriculture, Dholi Muzaffarpur, (Bihar) Under all India Co-ordinated Research Project on Spices (ICAR). Experiment was laid out in Randomized Block Design with four replications and eight treatments. Treatments namely, T₁-Inorganic N (100%) + *Azospirillum* + 5t ha⁻¹ FYM, T₂-Inorganic N (75%) + *Azospirillum* +5t ha⁻¹ FYM, T₃-Inorganic N (50%) + *Azospirillum* +5t ha⁻¹ FYM, T₄-5 t ha⁻¹ FYM+ *Azospirillum*, T₅-5 t ha⁻¹ FYM alone, T₆-10 t ha⁻¹ FYM +*Azospirillum*, T₇-10 t ha⁻¹ FYM alone and T₈ - Control.

The recommended dose of phosphorus and potash (60kg and 120 kg ha⁻¹) were incorporated in the field with all treatments. The crop was sown in last week of May. The plot size was 3.0m x1.0m. The plants were spaced at row to row distance of 30 cm and rhizome/plant to rhizome/plant 20 cm. Soil application and seed treatment of *Azospirillum* at the rate of 10 kg ha⁻¹ was inoculated in FYM and inoculated FYM was incorporated in the field as well as seed treatment. After treatment of seeds, seeds were spread and dried in the shade for 30 minutes and the seeds were planted.

For recording the observations, the technique of random sampling was adopted and five plants per net plot were randomly selected in each treatment from all the replications for recording the observation on growth characters like height of the plants (cm), number of tillers per plant, number of leaves per tiller, yield per plot (kg/