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Influence of partial shade and integrated nutrient management on morphological parameters and yield of turmeric (*Curcuma longa* L.)

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ABSTRACT

A field experiment was conducted at Horticultural College and Research Institute, Coimbatore to study the effect of partial shade, inorganic, organic and biofertilizers on morphological parameters and yield of turmeric. The study was laid out in split plot design consisting of two main plots *viz.*, open and shade. The sub plot treatments consisted of different doses of inorganic fertilizers, organic manures, biofertilizers and growth stimulant constituting to about 40 different treatment combinations were studied for the morphological aspects and yield of turmeric cv. CL 147. The treatment combination M_2S_8 (shade + 100 per cent NPK + 50 per cent FYM (15 t ha^{-1}) + coir compost (10 t ha^{-1}) + *Azospirillum* (10 kg ha^{-1}) + phosphobacteria (10 kg ha^{-1}) + 3 per cent panchagavya) exhibited cent per cent sprouting (100.00), earlier sprouting (17.05 days), increased height of the plant (90.52cm), number of leaves (19.70) and leaf area (723.51cm^2) at 180 DAP and registered the highest per plot (18.07kg) and per hectare yield (34255kg ha^{-1}) as compared to the absolute control in open condition. Likewise the increased number of tillers (4.15) was recorded in the combination open + 100 per cent NPK + 50 per cent FYM (15 t ha^{-1}) + coir compost (10 t ha^{-1}) + *Azospirillum* (10 kg ha^{-1}) + phosphobacteria (10 kg ha^{-1}) + 3 per cent panchagavya as compared to absolute control.

Key words : Biofertilizers, Growth stimulants, Coir compost, Morphological parameters

Turmeric (*Curcuma longa* L.) an important spice cum medicinal plant belonging to the family Zingiberaceae commands a major share in foreign exchange. Solar radiation is one of the prime factors governing the growth and yield of crop plants. Turmeric is considered to be a tropical rain forest crop well acclimatized for lushy growth under low light intensities (pseophyte).

A certain degree of reduction of sunlight by provision of shade plays a crucial role in affecting the plant growth and yield and needs to be investigated in detail. Being a nutrient exhaustive crop, turmeric requires heavy input of fertilizers. Indiscriminate and imbalanced use of fertilizers will result in ecological problems which can not be ignored. Therefore, it is inevitable to adopt a strategy for judicious combination of chemical fertilizers, organic manures and biofertilizers to promote, nurture and facilitate sustainable farming for healthier and economical production. In India, though sufficient research on nutritional aspects of turmeric is available (Venkatesha *et al*., 1998), the reports on the standardization of fertilizer requirement under shaded condition are very scanty. With this background, the present investigation was taken up to study the influence of partial shade and integrated nutrient management on morphological attributes and yield of turmeric in different stages of crop growth.

MATERIALS AND METHODS

The experiment was conducted at the college orchard, Department of Spices and Plantation Crops, Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during the period 2002-04. The experiment was laid out in split plot design with forty treatmental combinations replicated twice. The genotype CL 147 owing to its superiority for yield and quality under shaded condition in preliminary trials was used for the present study. The following are the treatment details,

Main plot :

M_1 – Open

M_2 – Shade [Sesban (*sesbania sesban*) + castor (*Ricinus communis*)]

Sub plot :

S_1 - 100% NPK + 100% FYM (30 t ha^{-1}) (recommended dose – 125: 60: 90 kg NPK ha^{-1})

S_2 - 100% NPK + 50% FYM (15 t ha^{-1}) + coir compost (10 t ha^{-1})

S_3 - 100% NPK + 50% FYM (15 t ha^{-1}) + *Azospirillum* (10 t ha^{-1})

S_4 - 100% NPK + 50% FYM (15 t ha^{-1}) + phosphobacteria (10 t ha^{-1})