

Performance of Different Turmeric Cultivars Underoldmango Orchard at Murshidabad District of West Bengal

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ABSTRACT

An intervention was under take to evaluate the performance of different turmeric varieties under mango old orchard of Murshidabad district, by Murshidabad Krishi Vigyan Kendra, West Bengal University of Animal and Fishery Sciences at different adopted vil-lages of the Kendra at Murshidabad district. The experiment was carried out for 3 years with 2 improved turmeric cultivars with the local one. The cultivars was included in this study were 1. Saguna and 2., Surangana and 3. Conventional (Local) one was as

control and was cultured in 7 different farmer's field. The crop were planted in between the space under mango orchard, the mango orchard were selected is over 30 years old. The result reveals that the cultivar Suranjana produced highest projected yield 29.30 t/ha with a Benefit Cost ratio of 1.94 : 1 followed by Saguna with a B:C ratio of 1.78:1 compared with a B:C ratio of 1.61 : 1 in conventional varieties.

Keywords Turmeric, Saguna, Surangana, Intercrop-ping, Yield.

INTRODUCTION

Turmeric (*Curcuma longa* L), is well known as 'Indian saffron' since ancient time and is one of the most important commercial spice crop grown in India. It is used in diversified forms as a condiment, flavoring and coloring agent and as a principal in-gredient in Indian culinary as curry powder, having anti-cancer and anti-viral activities and hence finds use in the drug industry and cosmetic industry. India is the largest producer, consumer and exporter of turmeric in the world and West Bengal occupying the 4th position among the turmeric producing states of India. Turmeric can be grown as intercrops under different widely spaced perennial crops like coconut, mango (Sairam *et al.* 1997). In Murshidabad district of West Bengal, it widely practiced under old mango orchards with locally available cultivars, most of them were failed give satisfactory return, due to their low productivity. Considering the situation, the present

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Table 1. Physiological characteristics of different turmeric cultivars grown under mango orchard at Murshidabad district of West Bengal.

Cultivars	No. of tillers/clump	Plant height (cm)	Plant girth (cm)	No. of leaves	Leaf length (cm)	Leaf width (cm)	Rhizome yield per clump (g)
Local	2.26	118.43	5.69	10.48	52.40	11.04	380.46
Saguna	3.21	131.32	6.32	14.89	55.23	12.06	496.33
Suranjana	2.87	134.55	6.41	15.91	54.78	12.46	516.26
SEm±	0.0691	3.7778	0.1623	0.2962	1.0151	0.2453	8.4215
CD (5%)	0.2128	11.6397	0.5002	0.9125	NS	0.7557	25.9477

experiment was under taken to assessment of yield performance of different turmeric cultivars under old mango orchard at Murshidabad district.

MATERIALS AND METHODS

Field experiment was carried out at seven adopted villages of 3 blocks of Murshidabad district of West Bengal, which were located at 24°16'10" N latitude and 88°17'15" E longitude, the study was carried out for 3 years, from 2016 to 2018. The disease free healthy seeds of both the cultivars were collected from Bidhan Chandra Krishi Viswavidyalaya, Research Complex, Kalyani, Nadia, West Bengal, under the guidance and supervision of scientist of the University and were multiplied from the supplied progeny for the following 2 years and the experiment were carried out for 3 years. These studies was conducted to evaluate the performance of two improved turmeric cultivars a) Saguna (T_1), b) Suranjana (T_2) comparison to convention one (Daesi) (T_3) under full productive mango orchard of 30 years old were considered as treatments with 7 repetition of each cultivars and were evaluated following the Randomized Block Design (RBD). The corms sets (include at list two healthy sets) were planted at distance of 30×30 cm apart for all the cultivars after left a space of 1.5 m from the trunk of the mango plants at last week of April or May every year. The experimental soils were non-saline (EC 0.30 dS/m), sandy-loam in texture, neutral in reaction (pH 6.7), low in organic carbon (4.5 g/kg), available N (142 kg/ha), high in available P (50 kg/ha) and medium in available K contents (135 kg/ha). The mango orchard were fertilized separately with recommended fertilizer dose along with all the intercultural operation as per the recommended schedule and the turmeric cultivars were separately incorporated with

recommended dose of fertilizers (200:60:200 kg/ha) were applied in three splits and irrigated at regular interval and weed control and plant protection measures were followed the recommendation of (Roy *et al.* 2006). The crop was harvest at 8 months stage for utilizing as rhizome in the following year. The observations were recorded on from 5 randomly selected sample at 150 DAP and data were recorded on plant growth and yield attributing characters and rhizome yield on per plant basis and the project yield/ha was worked out considering 70 area were occupied by the intercrops. The data collected from different characters were analyzed by the method of analysis of variance given by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

The data presented in Table 1, revealed that, number of tillers per clump were varied significantly between 2.26 and 3.21. The number of tillers per clump was observed highest in cv Saguna (3.21 per clump) followed by 2.87 in Suranjana compared to 2.26 in the local one. The height of the plant was recorded maximum in cv Suranjana i.e. 134.55 cm followed by Saguna 131.32 cm and was recorded lowest 118.43 cm in case of Local cultivar. The plant height increased with the decrease of light levels. Plant height depends on a number of factors such as availability of required quality of water, mineral nutrients, quantity, quality and duration of light, temperature, area of growing space and genetic set-up of the plants. Sarker, (2010) reported that, plant grown in low light levels was produced taller plants.

The girth of the clump were varied between 5.69 and 6.41 among the cultivars under study and it was observed that the clump of cv Suranjana clump

Table 2. Projected yield and economics of different cultivars studied as intercrop under mango orchard.

Cultivars	Projected yield (t/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
Local	22.64	42250.00	67920.00	25670.00	1.61
Saguna	26.87	45350.00	80610.00	35260.00	1.78
Suranjana	29.30	45350.00	87900.00	42550.00	1.94
SEm±	0.1922	-	-	-	-
CD (5%)	0.5923	-	-	-	-

had highest basal girth of 6.41cm followed by in cv Saguna (6.32 cm) and was recorded only 5.69 cm in case of Local cultivar.

The average number of leaves produced during the growing period among the cultivars under study was varied between 10.48 and 15.91 per clump. The number of leaves was recorded maximum 15.91 in cv Suranjana and was only 10.48 in cv Local. Schoch (1972) stated that, cooler temperatures promote lower number of total leaf. The leaf length and width were varied between 52.40 cm to 55.23 cm and 11.04 cm to 12.46 cm, respectively. The length of the leaf was recorded highest 55.23 cm in cv Saguna followed by 54.78 cm in cv Suranjana and was recorded least in cv Local (52.40 cm), but in case of the width it was observed that most wide leaf was produced in cv Suranjana (12.46 cm) followed by 12.06 cm in cv Saguna compared to 11.04 cm cv Local (Table 1). The length of leaf blade of turmeric due to the situation of cellular expansion and cell division of leaves under shaded condition was reported by Sarker (2010).

The yield of rhizome per clump was recorded varied significantly among the cultivars under studies. It was observed that, the average yield per clump was varied between 380.46 g and 516.26 g among the cultivars under studies. The highest yield per clump was recorded 516.26 g per clump in cv Suranjana, followed by 496.33 g in cv Saguna compared to 380.46 g in cv Local. The reason of maximum yield of turmeric in agroforestry system might be due to that, the mango tree canopy did not affect much the intercrop turmeric crop whereas turmeric is a shade loving crop. The observation is in the line with the observation of Ali *et al.* (2018).

The projected yield was estimated on the basis

of 70% of the area of the orchard utilized for the production of inter crop turmeric. The data presented in Table 2. Indicated that, the harvestable rhizome produced by different turmeric cultivars were significantly varies between 22.64 and 29.30 t/ha. The highest project yield was reflected by cv Suranjana (29.30 t/ha), followed by 26.87 t/ha in cv Saguna in comparison to 22.64 t/ha in cv Local. Roy *et al.* (2006) also reported an projected yield of 16.26 to 31.44 t/ha in case of cv Saguna when grown as inter crops under coconut orchards with different inter crops.

The economic analysis was computed on the basis of existing prices of inputs, rhizome yield prevailing at the time of this study and presented in Table 2. It revealed that, the maximum estimated net return (Rs 42550/-) was obtained highest in cv Suranjana and the income per rupee investment was also showed maximum i.e. 1.94:1 compared to 1.61:1 in the cv Local.

REFERENCES

- Ali MM, Rahman MM, Islam S, Islam MA, Alam MR, Baril MS, Nahar MN (2018) Varietal performance of turmeric under mango based agroforestry system. *Am J Pl Sci* (9) : 995—1003.
- Gomez KA, Gomez AA (1984) Statistical procedures for agricultural Research (2nd ed), John Wiley and Sons, New York, pp 680.
- Roy SS, Hore JK, Sahu PK (2006) Efficacy of mulching in turmeric intercropped with coconut. *The Hort J* 19 (3): 242—246.
- Sairam CV, Gopaldasundaram P, Umamaheswari L (1997) Capital requirements for adoption of coconut based intercropping system in Kerala. *Ind Coconut J* 27 : 2—4.
- Sarker MM (2010) Performance of turmeric varieties under litchi based agroforestry system. MSc thesis. HSTU, Dinajpur.
- Schoch PG (1972) Effects of shading on structural characteristics of the leaf and yield of fruit in capcicum. *J Am Soci Horticult Sci* 97 : 461—464.