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RESEARCH PAPER

Yield performance and economic of tamarind based intercropping systems under northern dry zone of Karnataka

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Abstract : A field experiment was conducted to find out the suitable tamarind based intercropping systems under irrigated situation at Kittur Rani Channamma College of Horticulture, Arabhavi, Gokak, Belgaum (district), Karnataka. Eleven intercrops *viz.*, ajowan, ashwagandha, brinjal, carrot, chilli, coleus, garlic, ginger, lab lab bean, safed musli and turmeric were evaluated for their performance both under intercropping and sole cropping situations. The yield of the intercrops varied significantly between intercropping and sole cropping. Tamarind based intercropping system with safed musli recorded the highest net income (Rs. 3.152 lakh/ha) while the highest benefit cost ratio was obtained in tamarind + ginger cropping system (4.40) followed by tamarind + turmeric (2.49).

Key Words : Intercropping system, Yield, Tamarind, Economies

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INTRODUCTION

Tamarind (*Tamarindus indica* L.) plantation provides ideal conditions for growing of field crops in the inter space particularly during initial years of estabilishement. Yielding in tamarind generally commences at 9 to 10 years age and higher yields with complete coverage of canopy will be at more of estabilishment can be efficiently utilized by growing intercrops earning additional income. Information on growing of intercrops in pre bearing plantation of tamarind is meagre. As the farmers of the region are economically poor, need based research was carried out to identify suitable crops for tamarind based intercropping system for maximzing productivity and profitability.

MATERIAL AND METHODS

The field trial was carried at Kittur Rani Channamma College of Horticulture, Arabhavi, Gokak, Belgaum (district), Karnataka. The experimental site was located at 16^0 15' N latitude and 74^0 45' longitude at an altitude of 612m msl. Average annual rainfall of the tract is 641 mm, well distributed over five months in a year starting form June to October. The soil of the experimental site was medium black with a pH of 7.80.

An existing 8 year old tamarind plantation planted at a spacing of 6m x 6m, was utilized for the study on tamarind based intercropping systems, including ajowan, ashwagandha, brinjal, carrot, chilli, coleus, garlic, ginger, lab lab bean, safed musli and turmeric as associated intercrops. A set of crops grown as a intercrops were also cultivated as sole crop in open area to asses comparative performance. All agronoic practices were as per recommendations.

Paired comparison (students 't' test) was used to test the significance between intercropping and sole cropping.

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The returns of intercrops were computed on the basis of prevailing market prices.

RESULTS AND DISCUSSION

The yield data, showed significant differences among thr crops both under sole cropping and intercropping situations (Table 1). Tamarind based intercropping systems recorded the higher yield in case of coleus (26.33 q/ha), ginger (95.00 q/ha) and safed usli (9,94 q/ha) compared to sole cropping (14.55 q/ha, 68.06 q/ha and 7.04 q/ha, respectively), higher yield under sole cropping (open cropping) compared to intercropping was obtained in ajowan (9.85 q/ha compared to 4.72 q/ha in intercropping), ashwagandha (root yield 3.60 q/ha compared to 2.02 q/ha in intercropping), brinjal (38.89 t/ha compared to 22.16 t/ha intercropping), carrot (16.99 t/ha compared to 9.55 t/ha in intercropping), chilli (24.45 q/ha compared to 14.26 q/ha in intercropping), garlic (58.00 q/ha compared to 29.99 in intercropping), lab lab bean (12.65 q/ha compared to 5.59 q/ha in intercropping, respectively).

Jaswal *et al.* (1993) also recorded significantly higher yield in ginger under poplar (*Populus deltoids* L.) based intercropping system. Jayachandran *et al.* (1992) also observed significantly higher yields in ginger var. Zrio-de-Janeiro grown under 25 per cent shade compared to open cultiation. Hanigangadharan and Meermenon (2003) cv. Thodupuza

Table 1 : Yield performance of crops in tamarind based intercropping system and in open area

Treatments	Crops	Variety or Genotpyes	Type of produce	Unit	Yield under		t- value (5%)
					Inter-cropping	Sole cropping	
T_1	Ajowan	Rajasthan Local	Seed	q/ha	4.72	9.85	26.89*
T_2	Ashwagandha	Jawahar-20	Root	q/ha	2.02	3.60	6.34*
T_3	Brinjal	MAHYCO-10	Fruit	t/ha	22.16	38.89	30.43*
T_4	Carrot	Nantes	Root	t/ha	9.55	16.99	4.84*
T_5	Chilli	Byadagi dhabba	Fruit	q/ha	14.26	24.45	4.41*
T_6	Coleus	Chikkodi Local	Root	q/ha	26.33	14.55	4.77*
T_7	Garlic	AAS-2	Bulb	q/ha	29.99	58.00	5.72*
T_8	Ginger	Humanabad Local	Rhizome	q/ha	95.00	68.06	4.85*
T_9	Lab lab bean	Varuna	Seed	t/ha	5.59	12.65	6.44*
T_{10}	Safed musli	Bidar Local	Tuber	q/ha	9.94	7.04	10.40*
T_{11}	Turmeric	Salem	Rhizome	q/ha	153.76.	248.05	3.07*

* Significant between intercropping and sole cropping

Table 2 : Economics of crop in tamarind based intercropping system and in open area

Sr. No.	Intercropping system	Gross profit (Rs. In lakh)		Net profit (Rs. In lakh)		Benefit:Cost ratio	
		IC*	SC	IC*	SC	IC*	SC
T_1	Tamarind + ajowan	0.188	0.788	0.115	0.581	1.58	2.80
T_2	Tamarind + ashwagandha	0.258	0.737	0.167	0.436	1.82	1.45
T_3	Tamarind + brinjal	0.332	1.160	0.219	0.857	1.94	2.77
T_4	Tamarind + carrot	0.286	1.019	0.173	0.711	1.53	2.31
T_5	Tamarind + chilli	0.213	0.733	0.291	0.457	1.18	1.65
T_6	Tamarind + coleus	0.592	0.654	0.398	0.266	2.05	0.68
T_7	Tamarind + garlic	0.329	1.276	0.214	0.936	1.86	2.76
T_8	Tamarind + ginger	1.425	2.041	1.074	1.392	4.40	2.14
T_9	Tamarind + lab lab bean	0.105	0.447	0.042	0.235	0.67	1.11
T_{10}	Tamarind + safed musli	4.970	7.040	3.152	3.721	1.73	1.12
T_{11}	Tamarind + turmeric	0.615	1.980	0.438	1.480	2.49	2.95
	Mean	0.846	1.625	0.571	1.007	-	-
	S.E.±	0.042	0.076	0.026	0.049	-	-
	C.D. (P=0.05)	0.124	0.225	0.075	0.146	-	-
	CV (%)	8.630	8.12	7.740	8.51	-	-

IC- Tamarind based intercropping
SC- Sole cropping
* Excluding the cost of maintaenance of tamarind plantation

obtained higher rhizome yield of Kachocam (*Kaempferia galangal*) under 50 per cent shade.

There were significant differences among the crop both under intercropping and sole cropping situations with regard to gross profit per hectare and net profit per hectare (Table 2). Maximum gross return was obtained in safed musli both under intercropping (Rs. 4.97 lakh/ha) and sole cropping (Rs. 7.04 lakh/ha). The crop of lablab bean recorded the minimum profit under intercropping situation (Rs. 0.105 lakh/ha) and also in sole cropping situation (Rs. 0.447 lakh/ha).

Benefit cost ratio (B:C) ranged between 0.67 (lablab bean) and 4.40 (ginger) under tamarind based intercropping systems. Similarly under sole cropping situations it ranged between 0.68 (coleus) and 2.95 (turmeric).

Higher B:C ratio for intercropping in tamarind plantation was obtained in ginger (4.40) followed by turmeric (2.49)and coleus (2.05), compared to lowest with lab lab bean (0.67). Turmeric under sole cropping recorded maximum B:C ratio (2.95) while the minimum was with coleus (0.68).

Muralidharan (1980) reported higher coat benifit ratio for turmeric (1.45) when compared to sweet potato (0.51) in areca based intercropping system. Singh *et al.*(1999) obtained the highest net returns (Rs. 80,255/ha) when sugarcane was intercropped with garlic followed by fennel (Rs. 72, 849/ha). The higher monetary returns was obtained under intercropping of soyabean with ber (Singh, 1984 and Korwar *et al.*, 1988). Based on the results of the present study it can be concluded that, for tamarind based intercropping system crops *viz*., ginger, turmeric and coleus are promising under Northern dry zone of Karnataka.

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