RESEARCH NOTE International Journal of Agricultural Sciences, January to June, 2010, Vol. 6 Issue 1 : 359-360

Performance of safed musli (*Chlorophytum borivilianum*.L) in tamarind plantation as intercrop and as sole crop in open area

R.D. KUMAR, G.B. SREENIVASULU, S.J. PRASHANTH*, R.P. JAYAPRAKASHNARAYAN, S.K. NATARAJ AND N.K. HEGDE

Department of Spices and Plantation Crops, K.R.C. College of Horticulture, ARABHAVI (KARNATAKA) INDIA

Key words: Safed musli, Intercrop, Tamarind

Safed Musli grown as intercrop in pre-bearing tamarind plantation of six years age recoded significantly higher plant height (11.13 cm) and numbers of functional leaves (26.73) compared to crop grown in open area (8.93 cm and 21.60 respectively) at 90 days after planting (DAP) . Significantly higher dry weight of tuber was recorded under tamarind based intercropping situation (9.25 g/plant) compared to sole cropping in open area (5.86 g/plant). The economic analysis of the system revealed that intercropping of safed musli in tamarind plantation recorded significantly higher returns with a benefit: cost ration of 1.94 compared to 1.51 under sole cropping.

Tamarind (*Tamarindus indica* L.) is an important multipurpose domestic tree, well suited for commercial cultivation in dry zone. Intercropping in perennial plantation is one of the major forms of multiple cropping and is a potential system for increasing production especially under subsistence level of farming. In intercropping system, productivity is improved either by efficient interception of available solar energy or by having crops of greater radiation use efficiency (Anonymous, 1979). There is no background information available on the performance of safed musli as intercrop in tamarind plantation suiting the zonal agronomic conditions. Hence, a scientific approach to intercropping safed musli was undertaken to assess the comparative performance of safed musli in young tamarind plantation and as sole crop in open area.

A field experiment was conducted in the Spice and Plantation Crops unit of Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka. The soil was medium black with pH of 8.20. Available nitrogen, phosphorus and potassium content of soil were 128, 56 and 140 kg per hectare, respectively. Safed musli was grown in three replications both in tamarind plantation of 6 years old and in open area (as sole crop). Statistical comparison was worked out based on student't' test (Panse and Sukhatme, 1967) Recommended doses of fertilizer were applied to safed musli @ 60 : 65 : 20 kg NPK per hectare separately for both intercrop and sole crop (Singh and Chauhan, 2003), Half nitrogen dose and entire quantity of P_2O_5 and K_2O were applied as basal dose and remaining half of nitrogen was top dressed at 30 DAP. Distribution of photosynthetically active radiation (PAR) was studied with the help of digital photometer (Lux meter). Intercepted PAR was calculated by deducting reflected radiation (Qr) and radiation reaching soil surface (Qs) with total radiation (Qt). The crop was harvested according to maturity indices both under intercropping and sole cropping. Cost of cultivation was worked out based on prevailing market prices during March 2004.

Interception *i.e.* photo synthetically active radiation (PAR) in tamarind plantation by safed musli at 90 DAP was 21,462 lux compared to 24,639 lux in open area (Table 3). Plant height (11.13) and plant spread (54.50 cm) were significantly higher under intercropping at 90 DAP compared to sole cropping (8.93 cm and 50.36 cm, respectively) (Table 1). Similar findings were reported by Maheswarppa and Nanjappa (2001) in galangal (*Koempferia galangal* L.) intercropped with coconut and Karikalan *et al*. (2002) in gymnema (*Gymnema sylvertre* Retz.) intercropped with kapak (Ceiba pentandra). Significantly higher dry weight of tuber was recorded in tamarind plantation (9.25 g/plant) compared to sole cropping (5.86 g/plant) (Table 2). Similarly, number of tubers per plant and width of tuber were higher under intercropping (16.46 and 0.71 cm, respectively) compared to sole cropping (10.40 and 0.59 cm, respectively). Higher yield in tamarind plantation also resulted in higher benefit: cost ratio (1.94), compared to sole cropping (1.51). Higher yield of safed musli under intercropping may be attributed to favorable growth attributed, *viz.*, increased plant height, plant spread and leaf area apart from shade loving nature of plant and efficient use of available light. Hanigangadharan and Meermenon (2003) also reported higher yield of Kacholam under 50

*** Author for correspondence.** Present Address : Functional Food Development Department, Research and Development Centre, The Himalaya Drug Company, Makali, BANGALORE (KARNATAKA) INDIA

Table1 : Growth attributes of safed musli as an intercrop in tamarind plantation and as sole crop in open

Sr. No	Growth Attribute	30 DAP			60 DAP			90 DAP*[1]		
		IC	SC	t-value	IC	SC	t-value	IC	SC	t-value
1.	Plant height (cm)	4.20	2.46	10.88*	7.40	4.76	11.91*	11.13	8.93	19.39*
2.	Plant spread (cm)	27.46	24.66	2.61*	38.36	31.63	5.11*	54.50	50.36	3.17*
3.	Functional leaves (No./plant)	9.53	6.93	11.06*	18.46	14.26	12.61*	26.73	21.63	25.34*
4.	Leaf size (cm^2)	18.46	22.63	10.15*	58.80	61.03	10.19*	80.06	79.96	15.85*
5.	Leaf area (cm^2)	175.92	156.82	6.44*	1082.45	870.28	6.84*	2140.00	1727.36	10.97*

DAP = Days after planting; IC = Intercrop; SC = Sole crop
* = Significant at 5 per cent probability *[1] = At least

Table 2 : Yield performance and B:C ratio of safed musli as intercrop in tamarind plantation and as sole crop in open

Sr. No.	Yield attribute	Intercrop	Sole crop	t-value
1.	Fresh weight of tuber (g/plant)	37.80	25.00	3.09*
2.	Number of tubers per plant	16.46	10.40	3.23*
3.	Length of tuber (cm)	12.86	12.86	0.02
4.	Width of tuber (cm)	0.71	0.59	4.30*
5.	Dry weight to tuber (g/plant)	9.25	5.86	5.17*
6.	Dry tuber yield /plot ($g/3m^2$)	305.47	166.49	4.04*
7.	Dry tuber yield (q/ha)	10.18	5.55	4.04*
8.	Benefit Cest ratio (B;C ratio)	1.94	1.51	3.96*

* indicate of significance of value at P = 0.05

Table 3 : Distribution of photosynthetically active radiation (PAR) by safed musli as an intercrop in tamarind plantation and sole crop in open area

Days after Planting	Intercrop				Sole crop			
	Qt	Qr	Qs	QI	Qt	Qr	Qs	QI
30	27550	1990	1894	23666	29450	1750	1360	26340
60	32650	2055	2039	28556	37450	1495	3821	32134
90	28440	1955	4697	21462	35900	2505	8756	24639
Mean	29547	2000	2877	24561	34267	1917	4646	27704

Qt = Mean of total PAR Qr = Mean of reflected radiation
Qs = Mean of radiation at ground level QI = Intercepted PAR (QI =QT-QR-QS)

per cent shade and Singh and Chauhan (2003) observed that intercropping of safed musli with blackgram and mustard, produced higher yield. Higher benefit: cost ratio was recorded under intercropping situation (1.94) compared to sole cropping (1.51), indicating feasibility of growing safed musli as intercrop in tamarind plantation, during initial years of establishment.

REFERENCES

Anonymous (1979). Multiple Cropping in coconut and Arecanut Gardens. Ed. Nelliat, E.V. and Bhat, K.S., Central Plantation Crop Research Institure. *Tech. Bul.*, **3**:54.

Hanigangadharan and Meermenon (2003). Performance of Kacholam (Kaempferia galangal) ecotypes as influenced by variation in shade and preparatory cultivation. *J. Medi. & Aroma Plant Sci.*, **25**:976-980

Karikalan, T.V., Divya, M.P. and Gopi, D. (2002). Effect of intercropping and nitrogen management on growth and yield of medicinal plants under kapok. *Indian. J. Agron.*, **4**(2):88-93.

Maheshrappa, H.P. and Nanhjappa, H.V. (2001). Effect of planting material, plant population and organic manure on growth components and yield of galangal (*Kaempferia galangal*) when grown as intercrop in coconut garden. *Indian J. Agric. Sci.*, **71** (3): 183-186.

Panse, V.G. and Sukatme, P.V. (1967). *Statistical methods for Agricultural Workers*. Indian Council of Agricultural Research, New Delhi, p.354.

Singh and Chauhan, H.S. (2003). Safed musli (*Chlorophytum borivilianum*) Distribution, biodiversity and cultivation. *J. Med. & Arom. Plant Sci.*, **25**:712-719.

Received : July, 2009; Accepted : September, 2009