The Asian Journal of Horticulture; **Vol. 6 No. 1; (June, 2011) : 26-28**

Received : September, 2010; Accepted : December, 2011

Research Paper

Response of yield parameters and profitability of mullai to intercropping system (*Jasminum auriculatum*)

A. ANBURANI AND H. VIDHYA PRIYADHARSHINI

See end of the article for authors' affiliations

Correspondence to:
A.ANBURANI
Department of Horticulture
Faculty of Agriculture,
Annamalai University,
ANNAMALAI NAGAR
(T.N.) INDIA
Email : anbumohankarthi@2007rediffmail.com

ABSTRACT

Field experiment was conducted to study the response of yield parameters and profitability of mullai to intercropping system. The experiment was carried out in RBD consists of 10 treatments with three replications. The treatments consists of growing of intercrops *viz.,* dolichos bean, vegetable cowpea and cluster bean grown in three different spacing (30 x 15 cm, 45 x 15 cm and 60 x 15 cm). Sole jasmine, without any intercrops was treated as a control. The various yield parameters were recorded and statistically analyzed. The profitability was also worked out. Among the various yield parameters recorded the earliness in flowering, highest number of productive shoots per plant, flower yield per plant, flower yield per hectare and profitability were recorded in the vegetable cowpea intercropped at a spacing of 45 × 15 cm.

Anburani, A. and Priyadharshini, Vidhya, H. (2011). Response of yield parameters and profitability of mullai to intercropping system (*Jasminum auriculatum*), *Asian J. Hort.*, **6** (1) : 26-28.

Key words : Mullai, Intercropping, Yield parameters, Profitability

Mullai is one of the most popular jasmine species that is commercially grown in India. The flowers of jasmines are largely used for worship, garland making, general decoration and for hair adorning by ladies. Though it is primarily grown for fresh flower production, it occupies special importance as it is a promising crop for use as a starting material in the perfume and cosmetic industries and as a valuable source for export trade. In this situation, there is an urgent need to extent the cultivation and production of mullai. Normally pruned field of jasmine are left as such without any cultivation except in few places where farmers do raise pulses *viz.*, blackgram or greengram grown on a small scale for their home consumption. This traditional practice of intercropping legumes along jasmine is practiced only in few places. Intercropping system involves growing two or more crops of contrasting habit with the assumption that they could exploit the total environment more efficiently than a monoculture and results in increased overall production (yield) per unit area. As vegetables come to harvest earlier than pulses, like blackgram (or) greengram, and in addition to the reports of the earlier workers who repeatedly suggested vegetable cowpea, cluster bean and dolichos bean were used as intercrops. Intercropping system with legumes not only helps in utilization of nitrogen being fixed in the current growing season, but also helps in residual build up of nutrients in the soil rather wholly depleting the soil nutrients (Prasad and Mohan, 1995).

With the above said facts in mind, the present study was undertaken to study the response of yield parameters and profitability of mullai under various intercropping systems.

MATERIALS AND METHODS

Field experiment was carried out at Orathur village of Cuddalore district in mullai during the year 2002-2003. Three year old bushes of uniform growth and vigor raised by layering were utilized for this study. The bushes were pruned on the last week of December. The experiment was laid out in a Randomized Block Design with ten treatments and replicated thrice. The treatments consist of growing of intercrops *viz.,* Dolichos bean, Vegetable cowpea and Cluster bean grown in three different spacings (30 x 15 cm, 45 x 15 cm and 60 x 15 cm. Sole jasmine, without any inter crops was treated as a control. The required quantity of organic manure (FYM @ 25 t ha^{-1}) was given as a basal dose and the inorganic fertilizers (120: 240: 240g NPK $plant^{-1}$) were applied in four equal splits of monthly intervals from pruning. Vermiwash @ 1:5 dilution was sprayed at monthly intervals after pruning,

during the entire period of crop growth. The seeds of vegetable cowpea (var. CO.2), cluster bean (Pusa Sadabahar) and dolichos bean (Arka Vijay) were sown as per treatment (or) schedule. To sow one hectare, the seed requirement was 30-40 kg for cluster bean, 15 kg for vegetable cowpea and 25-30 kg for dolichos bean. Two-three seeds were sown in each hill. After the germination of seeds, the seedlings were thinned out and maintained as one seedling per hill. Crop management practices were followed as per recommendation. Data on number of productive shoots per plant, flower yield per plant and flower yield per hectare were taken at harvest and recorded treatment-wise and analysed statistically (Panse and Sukhatme, 1984). Tabular analysis was performed to assess the economics of production of main crop.

RESULTS AND DISCUSSION

The results of the present investigation showed that there was a significant difference in yield parameters of mullai due to various intercrops (Table 1).

The maximum number of productive shoots was observed in the treatment T_6 where jasmine was intercropped with vegetable cowpea at a spacing of 45 × 15 cm (235.98).The lowest number of productive shoots (204.29) was observed in T_1 (Sole jasmine). These favourable results may have occurred due to the additional supply of nitrogen due to intercropping would have increased the number of productive shoot, due to greater supply of food materials through increased photosynthesis, rapid cell division and cell elongation in meristematic region which ultimately gave significant number of productive shoots. Similar results have been recorded by Mishra and Solanki (1996) in cowpea.

The intercropping system significantly influenced the commencement of flowering. The early flowering of 65.00 days after pruning was observed in the treatment T_1 (Sole jasmine), while the delayed flowering by 71.00 days was recorded in T_5 (Jasmine + Vegetable cowpea at 30 × 15 cm spacing). The possible reason for delayed flowering under intercropping may be due to growing of intercrops leads to the competition for natural resources *viz*., light, moisture, nutrient and space among them and resulted in delayed flowering, while the plots with sole crop recorded the earliest flowering as there is absence of competition for the resources.

The significant increase in yield was observed in the treatment T_6 (Jasmine + Vegetable cowpea (45 × 15 cm) which recorded an yield of 5170.36 g plant^{-1} and 12925.90 kg ha^{-1}. This was comparatively followed by T_7 (Jasmine + Vegetable cowpea (60 × 15 cm)) which registered

Table 1. Effect of intercropping on yield parameters and economics of mullai

Treatments	Number of productive shoots per plant	Commencement of flowering (days)	Flower yield (g plant^{-1})	Flower yield (kg ha^{-1})	Cost of cultivation (Rs. ha^{-1})	Net income (Rs. ha^{-1})	B:C ratio
T_1 Sole jasmine	204.29	65.00	4400.25	11750.62	47600.25	385750.88	5.53
T_2 Jasmine + Dolichos bean (30 × 15 cm)	220.4[illegible]	68.75	4900.25	12250.62	56600.25	459556.03	5.51
T_3 Jasmine + Dolichos bean (45 × 15 cm)	231.96	66.25	5070.25	12675.62	58400.25	487692.28	5.81
T_4 Jasmine + Dolichos bean (60 × 15 cm)	230.84	66.25	4995.25	12488.12	57300.25	475820.03	5.85
T_5 Jasmine + Vegetable cowpea (30 × 15 cm)	221.65	71.00	5020.36	12550.90	57650.46	487896.78	5.75
T_6 Jasmine + Vegetable cowpea (45 × 15 cm)	235.98	68.50	5170.36	12925.90	59800.36	507883.35	5.53
T_7 Jasmine + Vegetable cowpea (60 × 15 cm)	235.02	68.75	5095.35	12738.37	58500.35	496293.03	5.54
T_8 Jasmine + Cluster bean (30 × 15 cm)	217.35	70.50	4825.25	12063.12	52452.25	430773.34	5.56
T_9 Jasmine + Cluster bean (45 × 15 cm)	221.78	66.50	4915.25	12288.12	54352.25	449717.78	5.78
T_{10} Jasmine + Cluster bean (60 × 15 cm)	224.75	67.50	4880.25	12200.62	53300.25	440738.15	5.78
S.E.	1.256	0.211	77.78	45.73			
C.D. (P 0.05)	2.555	0.473	37.35	95.45			

5095.35 g plant^{-1} and 12738.37 kg ha^{-1}, while the lowest yield per plant (4700.25 g plant^{-1}) and per hectare (11750.62 kg ha^{-1}) were observed in the sole jasmine (T_1). The probable reason for increased yield in T_6 might be due to the faster growth of vegetable cowpea which smothers the weed growth during initial stage and also by supplying nutrients by *in-situ* incorporation. The results corroborate with the findings of Lakshminarayanan (2004) in *Jasminum sambac*. This might have also happened due to the incorporation of leguminous intercrops as green matter. They decompose earlier and improved the nutrient status of the soil. The plant residues when decomposed in the soil liberate CO_2 and organic acids and neutralize the alkali present which improved the physical condition of soil and made the nutrients more available to the plants (Chhonkar and Tarafdar, 1984).

Increase in flower yield might also be attributed to the effect of vegetable cowpea would have provided an additional N to the crop through biological N fixation and mineralization of root biomass. In general, growth and yield of jasmine were markedly higher after incorporation of cowpea into the soil than it was removed for the fodder. These results are in close agreement with Velayudam and Jagdish Seth (1986). Ultimately incorporation of vegetable cowpea had helped the plant to produce increased number of lateral shoots, plant canopy and also higher flower bud initiation. These findings were supported by Rout *et al*. (1990) in maize + cowpea at 1:2 row proportions.

Among the various intercropping systems, jasmine intercropped with vegetable cowpea (45 x 15 cm) gave the highest gross income of Rs.598036, net income of Rs.507883.35 ha^{-1}and return per rupee invested (Rs.6.63). The least gross income (524525), net income (Rs.43017.34) was recorded in T_8 (Jasmine + Cluster bean at a spacing of 30 x 15 cm) and return per rupee invested was Rs.5.56 in the same treatment. In control (Sole jasmine).The gross income (Rs. 470025), net income was Rs.385150.88 ha^{-1} and Rs.5.53 was obtained as return per rupee invested. Similar results of increased cost economics with vegetable cowpea in double row spacing in *Jasminum sambac* was already reported by Lakshminarayanan (2004). The increased net profit and benefit: cost ratio in the above treatment was mainly due to the additional income obtained from vegetable cowpea than those of other inter crops.

Hence, based on the findings of the present investigation it can be concluded that growing of vegetable cowpea at a spacing of 45 × 15 cm in pruned fields were found to be more advantageous for obtaining maximum yield and higher returns in mullai (*Jasminum auriculatum*).

Authors' affiliations:
H. VIDHYA PRIYADHARSHINI, Department of Horticulture, Faculty of Agriculture, Annamalai University, ANNAMALAI NAGAR (T.N.) INDIA

REFERENCES

Chhonkar, P.K. and Tarafdar, J.C. (1984). Accumulation of phosphates in soils. *J. Indian Soc. Soil Sci.,* **32** : 325-329.

Lakshminarayanan. M. (2004). Studies on intercropping of leguminous vegetable cowpea in pruned fields of jasmine (*Jasminum sambac*.). M.Sc. (Ag.) Hort. Thesis, Annamalai University, Annamalainagar, T.N. (India).

Panse, V.G. and Sukhatme, P.V. (1978). *Statistical methods for agricultural workers*. ICAR Publications, New Delhi. Pp.225.

Prasad, K.S. and Mohan, N.K. (1995). Intercropping of different vegetables and field species with brinjal. *Indian J. Agric. Sci.,* **65** (1) : 39-41.

Shailesh Mishra, K. and Solanki, R.B. (1996). Effect of *Rhizobium* inoculation, nitrogen and phosphorus on growth and seed yield of cowpea (*Vigna sinensis*). *Indian J.Hort.,* **53**(3):220-224.

Sharma, U.J. and Chakravarty, M. (2005). Synergistic effect of cowpea grown for fodder on nitrogen economy and yield of okra (*Abelmoschus esculentus* (L.) Moench.). *Adv. Plant Sci.,* **18**(11):745-748.

Velayudham, K. and Seth, Jagdish (1986). Effect of the preceding crops of cowpea and maize on the yield of wheat. *Indian Agric. Sci*., **56**:263-266.

****