



Prospects of Intercropping Medicinal and Aromatic Plants in Coconut Garden

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A field experiment was conducted at Coconut Research Station, Veppankulam in 36 years old coconut garden to explore the possibility of intercropping herbal plants. Among the three medicinal and two aromatic plants evaluated, based on the performance and economics all the selected herbal plants viz., *Alpina galanga* (Sitharathai), *Aloe vera*, (Chotru kathalai) *Ocimum sanctum* (Tulsi), *Symbopogan flexuosus* (Lemon grass) and *Pogestemon Patchouli* (Patchouli) were found to be suitable intercrops in adult coconut garden. Based on the marketability and soil suitability, coconut farmers can choose any of the herbal crops and grow them profitably as intercrop in coconut and get additional revenue from their coconut garden.

Key words: Coconut, intercropping, medicinal and aromatic plants

Coconut (*Coconus nucifera* Lin.) is a perennial palm and survives for more than 60 years. Nearly 60 per cent of space in 7.5 x 7.5 m spaced adult coconut gardens and 40 per cent of sunlight are left unutilized which provides ample scope for raising soil, climate and market specific intercrops profitably with synergistic effect on coconut (Nelliath, 1979). This provides additional revenue to the coconut farmers. Tuber crops, fruits crops, rhizomes, cereals, pulses and vegetables can be grown well under coconut garden (Rethinam, 2001). Intercropping of citronella increased the land use efficiently from 21-46% with additional yield of main crop (Prakash Roa *et al.*, 1988). The possible intercrops in coconut garden include perennial, biennial and seasonals including medicinal and aromatic plants. In the present scenario of fluctuation in coconut price and high wage rate for labourers, the pure crop of coconut is no more economical. Hence, intercropping in coconut garden becomes indispensable for augmenting the income of the coconut farmers. The coconut based cropping system involves cultivation of compatible crops in the interspace of coconut leads to considerable increase in the production and productivity per unit area by increasing the cropping intensity by more efficient utilization of sunlight, soil, water and labour. The world health organization (WHO) compiled 20,000 medicinal plants used in different parts of the globe. Among these, over one hundred herbal botanicals are reported to have consistently larger market and are traded in major drug markets in the world. Baby P Skaria *et al.* (2005) reported that Ginger, Sitharathai, Turmeric, Kasthurimanjal and Patchouli are the medicinal plants suited for

intercultivation in coconut gardens of Kerala. In this juncture, the present investigation was carried out to evaluate the performance of medicinal and aromatic plants as intercrops in adult coconut groves for augmenting the income of coconut farmers.

Materials and Methods

A field experiment was carried out between 2006 to 2008 in 36 years old ECT coconut garden at Coconut Research Station, Veppankulam to study the feasibility of raising soil and climate specific herbal plants as intercrop in coconut. The herbal plants chosen for this experiment were three medicinal plants viz., Sitharathai (*Alpina galanga*), Chotrukathalai (*Aloe vera*) and Tulsi (*Ocimum sanctum*) and two aromatic plants viz., Lemon grass (*Cymbopogan flexuosus*) and Patchouli (*Pogestemon patchouli*). The experimental soil was sandy loam in texture with available NPK of 199, 4.9, 79 kg ha⁻¹ respectively and pH, 7.03, EC 0.13 with a organic carbon of 0.22 per cent. The experiment was conducted in Randomized Block Design, replicated five times with a plot size of 15 x 4 m (1.5 per cent) in between four coconut palms leaving 2 feet from the base of palms. The intercrop received only organic manure viz., FYM @ 25 tonnes ha⁻¹ and other intercultural operations as per the package for herbal plants. No serious pest and disease was noticed in the experimental crops. For minor seasonal pests neem oil was sprayed based on need. The yield of economic parts of each herbal plants was recorded after processing and finally the economics of intercropping with herbal plants in coconut garden was worked out.

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Results and Discussion

The selected medicinal and aromatic plants performed well and recorded better yield as

Table 1. Yield of herbal plants (economic parts) as intercrop in coconut garden (Mean of five plots of two years) (2006-07 & 2007-08)

S. No.	Common name	Scientific Name	Duration	Yield (kg ha ⁻¹)
Medicinal plants				
1.	Sitharathai	<i>Alpina galanga</i>	18 Months	3260
2.	Chotrukathalai	<i>Aloe vera+</i>	6-7 Months	12750
3.	Tulsi	<i>Ocimum sanctom</i>	1 Year	16000
Aromatic Plants				
1.	Lemon grass	<i>Cymbopogan flexuosus</i>	4 Years	7342
2.	Patchouli	<i>Pogestemon patchouli</i>	3 Years	1240

intercrop in adult coconut garden (Table 1). Sitharathai recorded a yield of 3260 kg of dry tuber ha⁻¹. Aloe vera and Tulsi recorded 12750 kg of fresh

leaf ha⁻¹ and 16.0 tonnes of fresh leaf ha⁻¹ respectively. In case of lemon grass, the yield was 7342 kg of dried leaf ha⁻¹ and for Patchouli, it was 1240 kg of dried leaves ha⁻¹

The selected medicinal and aromatic plants recorded better net return and B: C ratio as intercrop in coconut garden (Table 2). Sitharathai recorded a net return of Rs. 89,898 ha⁻¹ and a B: C ratio of 1:3.2. Aloe vera and Tulsi recorded a net return of Rs. 1, 41,058, 43,280 and the B:C ratio of 1:3.8 and 1:3.0, respectively. With regard to aromatic plants, lemon grass recorded a net return of Rs. 16,085 ha⁻¹

and B: C ratio of 1:2.1 and Patchouli recorded a net return of Rs. 19,010 and B: C ratio of 1:2.1. Maheswari *et al.* (1985) have brought out that growing of ravolfia as intercrop gave extra income in coconut groves. Maheswari *et al.* (1995) reported profitable cultivation of Patchouli in irrigated coconut orchard

Table 2. Economics of intercropping medicinal and aromatic plants in coconut garden.

S. No.	Particulars	Yield (kg ha ⁻¹)	Gross return (Rs.)	Cost of cultivation (Rs.)	Net return (Rs.)	B:C Ratio
1.	Sitharathai	3260	1,30,400	40,502	89,898	1: 3.2
2.	Chothukathalai	12750	1,91,250	50,192	1,41,058	1: 3.8
3.	Tulsi	16000	64,000	20,720	43,280	1: 3.0
4.	Lemon grass	7342	30,000	13,915	16,085	1: 2.1
5.	Patchouli	1240	35,750	16,740	19,010	1: 2.1

of Kerala, wherein the shade intensity was between 25-50%. Besides, intercropping herbal plants in coconut enhanced the mean annual nut yield to the tune of 18 per cent (145 nuts/ palm /year) over that of pure coconut (123 nuts / palm / year).

Conclusion

Based on the performance and economics of the chosen herbal plants, all the selected plants *viz.*, Sitharathai, Chothukathalai, Tulsi, Lemon grass and Patchouli were found to be suitable intercrops in adult coconut garden. Based on the marketability and soil suitability, coconut farmers can choose any one of them and grow profitably as intercrop in coconut garden to get additional revenue besides conserving soil.

Acknowledgment

The author greatly acknowledges the AICRP on Palms for the financial support to carry out this study.

References

- Baby, P., Skaria, Gracy Mathew, P.P. Joy and Samuel Mathew. 2005. Aromatic and medicinal plants research station. *Indian Coconut J.*, XXXVI: 12-18
- Maheswari, S.K., Dhantonde, B.N., Yadav, S. and Gangrade, S. K. 1985. Intercropping of *Rauvolfia serpentina* for higher monetary return. *Indian J. Agric. Sci.* **58**: 487-88.
- Maheswari, S.K., Sharma, R.K. and Gangarade, S.K. 1995. Studies on spatial arrangements in Palmarosa-Pigeon pea intercropping in black cotton soil. *Agron. J.* **92**: 812-818
- Nelliat, E.V. 1979. Prospects of multiple cropping in coconut based farming system -The Indian Experience. *Indian Coconut J.*, **32**: 3-11.
- Prakash Rao, E.V.S., Singh, M. and Ganesh RAO, R.S. 1988. Intercropping studies in Java citronella (*Cymbopogon winterianus*). *Field Crop Res.* (Admestrum) **18**: 279-286
- Rethinam, P. 2001. Research output and farmers adoption of technology on coconut based farming system - The Indian Experience. *Indian Coconut J.*, **32**: 3-11.