

## Mixed cropping systems in cardamom (*Elettaria cardamomum* Maton) - An analysis

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### Abstract

Surveys and economic analyses conducted in various cardamom (*Elettaria cardamomum*) plantations adopting mixed cropping systems in Kerala and Karnataka, India indicated that inclusion of black pepper (*Piper nigrum*) or coffee (*Coffea arabica*) and arecanut (*Areca catechu*) was highly remunerative giving high cost-benefit ratios.

**Key words :** cardamom, economics, *Elettaria cardamomum*, mixed cropping.

Though mixed cropping systems involving cardamom (*Elettaria cardamomum* Maton) are in vogue in many cardamom growing areas of Kerala, Karnataka and Tamil Nadu, little information is available on the economic viability of various systems. Such information is vital since cardamom is becoming a less remunerative crop in recent years and farmers are resorting to cultivation of different crops either along with cardamom or completely replacing it.

An attempt has been made here to analyze the economics of various mixed cropping systems involving cardamom, based on surveys conducted by the Indian Cardamom Research Institute, Myladumpara, during 1993 and 1994. Information on various mixed cropping

systems involving cardamom was collected by the field units of the Spices Board, Kochi. Based on the information, selected cardamom plantations were visited in Santhanpara, Udumbanchola, Kattapana, Kumily, Vandanmettu, Nedumkandom and Elappara Zones in Kerala, Saklespur, Sirsi, Siddapura and Sringeri Zones in Karnataka and Manalur, Pachallur, Coonoor and Valparai Zones in Tamil Nadu. Details on cultivation practices followed, cost of inputs and labour, marketing methods adopted and problems faced in adopting mixed cropping systems were collected from the selected plantations. In Tamil Nadu, such information could not be collected because no systematic records were maintained in these plantations. An assessment of cost-benefit ratios in

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adopting mixed cropping systems was also made for Kerala and Karnataka.

## Kerala

1. Cardamom + Black Pepper : This system is in practice in many plantations in the cardamom growing tracts of Idukki District, especially at Santhanpara, Elappara, Nedumkandom, Kumily, Vandannmettu and Vandiperiyar. The cost-benefit ratio (1:4) for this cropping system showed that this system is economically viable (Table 1).

2. Cardamom + Arecanut + Black Pepper : This system is observed in some plantation in Idukki District where shade is less. The cost-benefit ratio of 1:3.5 for this system indicates that this system can be successfully adopted in areas where shade is less.

3. Cardamom + Arecanut + Black Pepper + Coconut : This system is adopted only in very few plantations in Kumily and Vandiperiyar areas in Idukki District. However, the performance of cardamom, arecanut and black pepper is not satisfactory possibly due to the enhanced root competition for water and nutrients. The cost-benefit ratio of 1:3.5 worked out for this cropping system shows that this system is affordable especially in level or gentle slope areas.

4. Cardamom + Rubber + Arecanut: This system is seen only in a very few plantations and the performance of the crops is not satisfactory. The cost-benefit ratio of 1:2 indicates that this system may not be sustainable.

5. Cardamom + Banana : Only very

Table 1. Economics of mixed cropping systems in Kerala

Cropping system	Plant density (ha <sup>-1</sup> )	Yield (kg ha <sup>-1</sup> )	Price (Rs. kg <sup>-1</sup> )	Expenditure (Rs.)	Average annual income (Rs.)	Cost-Benefit Ratio
Cardamom + Black Pepper	1000 750	200 1600	300 50	35,000	1,40,000	1:4
Cardamom + Arecanut + Black Pepper	1000 750 750	250 1600 1765	300 5 50	45,000	1,82,000	1:3.5
Cardamom + Arecanut + Black Pepper + Coconut	1000 500 500 75	150 1500 1700 7500 (nuts)	300 5 50 3 (nut <sup>-1</sup> )	45,000	1,60,000	1:3.5
Cardamom + Rubber + Arecanut	750 500 500	125 1000 1500	300 40 5	40,000	85,000	1:2
Cardamom + Banana	1000 750	100 750 (bunches)	200 40 (bunch <sup>-1</sup> )	25,000	50,000	1:2

Table 2. Economics of mixed cropping systems in Karnataka

Cropping system	Plant density (ha <sup>-1</sup> )	Yield (kg ha <sup>-1</sup> )	Price (Rs. kg <sup>-1</sup> )	Expenditure (Rs.)	Average annual income (Rs.)	Cost Benefit Ratio
Arecanut + Cardamom	1400 2500	6000 300	10 200	36,000	1,20,000	1:3.5
Arecanut + Cardamom + Black Pepper	1400 2000 750	5000 196 300	10 200 40	33,000	1,01,200	1:5
Arecanut + Cardamom + Black Pepper + Coconut + Banana	1000 2000 750 500 400	1000 100 200 14000 (nuts) 300 (bunches)	10 200 40 1 (nut <sup>-1</sup> ) 20 (bunch <sup>-1</sup> )	11,200	58,000	1:5
Arecanut + Coffee + Cardamom + Black Pepper	1000 1000 1500 750	6030 500 100 300	10 40 200 40	21,500	1,12,300	1:5
Coffee + Cardamom + Black Pepper	1000 2000 750	750 300 500	40 200 40	33,650	1,10,000	1:3.5

few plantations located in Udumbanchola village of Idukki District have adopted this system. While banana needs swampy soil conditions and zero shade for optimum growth, cardamom grows well in moist, well drained soils and requires 40-60% shade. This cost-benefit ratio of 1:2 worked out for this system shows that system is not economically feasible.

### **Karnataka**

In Karnataka region, mixed cropping systems in cardamom plantations are mostly seen in Sirsi, Sringeri and Saklespur areas. Arecanut is the most common crop grown with cardamom. The economics of various crop combinations prevalent in this region indicated that multiple cropping systems of Arecanut + Cardamom + Black Pepper recorded the highest cost-benefit ratio of 1:5. However, the crop combinations of

Arecanut + Coffee + Cardamom + Black Pepper and Arecanut + Cardamom earned more profit i.e., Rs 90,800 and Rs. 84,000 respectively, compared to the other combinations (Table 2).

The survey indicated that inclusion of either black pepper alone as in Kerala or in combination with coffee and arecanut as in Karnataka in mixed cropping system involving cardamom is highly remunerative and can give high cost-benefit ratios.

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