

## Input requirement in mixed cropping of arabica coffee with cardamom

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Plantation crops offer better scope for maximising production per unit area. These crops if chosen on the basis of canopy and root architecture and space appropriately, can make better use of the soil both in the horizontal and vertical planes, and air space to greater heights, intercepting solar energy at different strata of the crop canopies, and producing much higher quantities of biomass as well as higher income. Both coffee and cardamom are a high value crops which are psycophytic (shade loving) in nature and require an over head shade of evergreen forest trees. Both these crops are cultivated at high ranges of western ghats of South India viz., in Karnataka, Kerala and Tamil Nadu. Majority of coffee plantations are constituted by small holdings below 2 hectares (86.3%). Productivity of these units should be increased by intensive cultivation of coffee, resorting to diversification with suitable perennial crops to improve and sustain high income from available area.

The Economics of mixed cropping of coffee with cardamom scandy. It is quite imperative to mobilize and arrange different agricultural cash inputs at an appropriate time to cope up with the seasonal operations particularly when the mixed cropping is to be adopted. Hence a study was undertaken to analyse the input wise costs in the mixed and monocropping of arabica coffee.

### MATERIALS AND METHODS

Alternate rows of coffee (planted in 1982) at a spacing of 2.1 x 2.1 m, were removed in 1992 so as to introduce cardamom as a mixed crop. After removing alternate rows, coffee could get a spacing of 4.2 x 2.1 m. The inter row spacing of 4.2 m (between rows of coffee) was used for planting cardamom during June in a single hedge row at 1.5 m apart (within a row). The details of the experimental lay out are given in table 1.

Regular cultural operations, irrigation and plant protection were carried out in arabica coffee and cardamom as per schedule. Besides the application of well decomposed coffee pulp @ 3 tonnes, recommended dose of fertilizer was applied on per plant basis separately to each crop.

Tabular analysis was performed to compute the 3 years average cost of cultivation and input wise details of mixed cropping of arabica coffee with cardamom and monocropping of arabica coffee. Returns were calculated by multiplying each average crop out put with respective average prices.

### RESULTS AND DISCUSSION

**Fertilizers/Manures:** The fertilizers/manures cost accounted 15.49 per cent of the total cost of cultivation (Rs.56518/ha.). In the system, out of the total cost of fertilizer/manures of Rs.8757/ha, cardamom accounted 55 per cent and that of arabica coffee 45 per cent respectively. This difference in fertilizer/manures cost among the crops in the system was mainly due to application of fertilizers/manures to both the crops separately as per the recommended dose.

### Pesticide

Out of the total cost of cultivation, the pesticide cost accounted 5.73 per cent. Among the crops cardamom accounted 78.78 percent of the pesticide cost of the mixed cropping system. The pesticide cost of arabica coffee was mainly towards controlling of leaf rust and periodical tracing and removal of white stem borer infested stumps.

### Labour input

Out of the total cost of cultivation of Rs.56518/ha, the cost of labour accounted major share of 69.26 percent indicating the intensive requirement of labour in the mixed cropping of arabica coffee with cardamom.

Cost towards labour for individual crops in the mixed cropping system: The labour wages towards the individual crops namely cardamom was Rs.10,060 (59.91 per cent of total wages paid) and that of arabica coffee, Rs. 7311 (40.09 per cent of total wages paid) for various operations like application of fertilizers/manures, plant protection measures, harvesting etc. As per the



plantation regulation act the labourers working both on arabica coffee and cardamom plantations get the fringe benefits/incentives on total labour wages Table 2. Accordingly a sum of Rs.10944 was incurred accounting to 19.21 per cent of total cost of cultivation. In case of cardamom out of the important labour operations like application of fertilizers, plant protection measures and harvesting, the highest expenditure was incurred on harvesting and processing (Korikanthimathi 1)

Harvesting of cardamom is a skilled and specialised job which is normally done better by women labourers. Normally 6-7 rounds of picking was done in a crop season. Delay in picking may result in splitting of capsules and damage by rodents and birds (Korikanthimathi and Naidu 2) thus, mobilizing of skilled and experienced labourers for timely harvesting is an important factor for obtaining high crop recovery and returns. Arabica coffee is harvested in one lot when the entire crop is fully matured as against cardamom which needs to be harvested at regular intervals. In this direction it is clear that mobilizing of labour resources in the mixed cropping of arabica coffee with cardamom deserves special emphasis.

#### Expenditure shared by both arabica coffee and cardamom

Common cultural operations: The main advantage of growing mixed cropping was to use the resources efficiently and to reduce the cost of cultivation by saving labour force with the common cultural operations like weeding, mulching, shade regulations, irrigation etc. Accordingly, in the mixed cropping of arabica coffee with cardamom, the cost of common cultural operations worked out to be Rs.5627/ha accounting 9.96 per cent of the total cost of cultivation. If the cardamom and arabica coffee were to be grown as sole crops Rs.5267/ha would have been incurred separately for both the crops. Mixed cropping of arabica coffee with cardamom is a labour intensive programme and all the cultural operations have to be carried out manually. As cardamom is a shade loving plant and is grown beneath the ever green forest trees, mechanization becomes hardly possible and it is imperative to share these common operations to bring down the labour requirement and cost of cultivation by mixed cropping of arabica coffee with cardamom.

#### Irrigation and other costs

A common irrigation is done for both cardamom and arabica coffee at an interval of 15 days with the commencement of summer from middle of February right up to end of May adjusting with the receipt of pre monsoon showers. The common irrigation i.e. fuel cost worked out to be Rs.1343/ha constituting 2.39 per cent of total cost of cultivation. The irrigation provided in the cropping system not only helps in saving cost towards fuel/power charges but also in supplementing the residual moisture. The other cost components namely application of pesticides, maintenance of farm machinery and managerial expenses (inclusive of 63% of incentives) accounted 4.46, 2.68 and 4.75 per cent of the total cost of cultivation respectively. Thus the total common expenditure of mixed cropping of arabica coffee with cardamom worked out to be Rs.13692 per hectare.

#### Monocropping of arabica coffee (partitioning of inputs)

The total cost of cultivation of monocropping of arabica coffee worked out to Rs.27782 per hectare of which the labour cost accounted chunk share of 64.54 per cent (Rs.17931/ha). The material inputs like fertilizers/manures and pesticides accounted 13.79 and 2.44 per cent of the total expenses. The other items of expenditure such as irrigation-fuel/power charges, maintenance of farm machinery and managerial expenses together accounted 19.22 per cent (Rs.5342/ha) of the total expenses.

Further the average of 3 years results revealed that the gross (Rs.117900/ha) and net (Rs.62898/ha) returns of mixed cropping of arabica coffee and cardamom were more by 2.72 and 4.04 times compared to monocropping of arabica coffee. Thus it is apparent from the results that the mixed cropping of arabica coffee with cardamom besides generating additional employment helped to build up farmers economy by reducing the cost of some of the common operations and generating additional income.

#### SUMMARY

Perennial plantation crop like arabica coffee offers better scope for maximising production per unit area by resorting to diversification of compatible high value component plantation crops. Amongst the four important cash inputs namely fertilizers, pesticides, labour and irrigation, the



maximum expenditure was incurred towards labour Rs.39144.37/ha (62.26% of total cost of cultivation). A common expenditure (Rs.13692/ha) accounted 24.22 per cent of total cost of cultivation which helped in sharing the common cultural operations and other inputs for both the crops compared to monocropping. The net returns generated in mixed cropping was more. by 4.04 times compared to monocropping of arabica coffee. Thus, mixed cropping helped in generating additional income through reduction in cost of cultivation and also provided gainful employment.

**LITERATURE CITED**

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