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# Foliar Application to Enhance the Yield in Cashew (*Anacardium occidentale* L.)

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## A B S T R A C T

Cashew (*Anacardium occidentale* L.), a tree native of Eastern Brazil, was introduced in India by the Portuguese nearly five centuries ago. In India, cashew is grown in the peninsular areas of Kerala, Karnataka, Goa and Maharashtra, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal. The country is the single largest producer and exporter of cashews, accounting for 40% of the global share. In Tamil Nadu Pudukkottai, Cuddalore, Perambalure, Sivagangai districts are contributing majore share cultivating Cashew. In Pudukkottai Thiruvarankulam, Gardarvakkottai and Arimalam are the three main blocks cultivating Cashew. Totally 6365ha are cultivating Cashew in this district with the production value of 5665 MT. The 2016 season started at 115 to 117 per kg as against the starting price of 102 to 105 per kg last season. KVK, Vamban, Pudukkottai conducted Front Line Demonstration on foliar nutrition in cashew study was carried out in Pudukkottai district with the following objective. To study the socio-economic profile of the sample farmer s viz., To analyze the labour and input utilization pattern in Cashew cultivation, To analyze the profitability in Cashew cultivation, To document various constraints faced by the Cashew growers in the study area. Technological foliar recommendation viz., New flush stage Foliar application of 1% 19:19:19, Flowering stage: Foliar application of MAP 1% + borax 0.1%, Fruit set stage Foliar application of Panchagavya 3%. It has been observed that technological interventions like foliar spray, swabbing with recommended chemicals and plant protection measures (Ohler, 1979) increased nut yield by 20- 25per cent at farmer's field and with the application of irrigation and foliar spray during December, January and February, the yield increased by 20 percent (Gibbon, 2001), Integrated Crop Management cultivation was found to be economical with a B:C ratio of 3.0. Efforts should be made in the selection and production of improved released verities, identification of appropriate quantity and time of irrigation, training on application of organic input should be provided. From the study it was revealed that price of dried nuts with minimal processing fetches more price than raw nuts. Therefore, the farmers need to be encouraged to take up processing by themselves by giving them subsidy and/or loan for establishing the small scale processing units.

## Introduction

Cashew (*Anacardium occidentale* L.), a tree native of Eastern Brazil, was introduced in India by the Portuguese nearly five centuries ago. In India, cashew was first introduced in Goa, from where it spread to other parts of the country. Initially, it found use in soil binding to check erosion. Commercial cultivation began in the early 1960s and, over the years, cashew became a crop with high economic value and attained the status of an export-oriented commodity, earning considerable foreign exchange for the country [3].

India is the major cashew growing country in the Asia-Pacific, positioned as the largest producer of raw cashew nut (RCN) globally with 5.5 lakh metric tons per annum. In India, cashew is grown in the peninsular areas of Kerala, Karnataka, Goa and Maharashtra, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal. The country is the single largest producer and exporter of cashews, accounting for 40% of the global share. In Tamil Nadu Pudukkottai, Cuddalore, Perambalure, Sivagangai districts are contributing major share cultivating Cashew.

In Pudukkottai Thiruvarankulam, Gardarvakkottai and Arimalam are the three main blocks cultivating Cashew. Totally 6365ha are cultivating Cashew in this district with the production value of 5665 MT.

The 2016 season started at 115 to 117 per kg as against the starting price of 102 to 105 per kg last season. KVK, Vamban, Pudukkottai conducted Front Line Demonstration on foliar application in cashew during 2017-18 to increase the production and productivity in cashew In this context, the study has been conducted in Tiruvaranklam block of Pudukkottai district with the current study was carried out in Pudukkottai district with the following objective,

To study the socio-economic profile of the sample farmers.

To analyze the labour and input utilization pattern in Cashew cultivation.

To analyze the profitability in Cashew cultivation.

To document various constraints faced by the Cashew growers in the study area.

## Materials and Methods

The study was conducted in Pudukkottai district Tamil Nadu. The block name is Thiruvarankulam, was selected for the purpose of study. Data were collected from the primary sources (respondents) with the aid of a structured interview schedule consisting of both open and close ended questions.

The data collected was on general characteristics of farmers, land holding, costs, returns, yields, constraints faced in cultivation of Cashew. The primary data from 10 sample respondents pertained to the agricultural year 2018-19. Multistage purposive cum random sampling method was from the farmer.

One major cashew growing block was selected for the study. Thus, a total of ten farmers from one block namely K. Rasiyamangalam village was selected for the study. From the village ten farmers were randomly selected. Both Farm budgeting and partial budgeting technique was used to estimate the cost and return structure of Cashew cultivation. The benefit cost ratio was calculated for profitability analysis.

## Technological Foliar Recommendation

### New flush stage

Foliar application of 1% 19:19:19

### Flowering stage

Foliar application of MAP 1% + borax 0.1%

### Fruit set stage

Foliar application of Panchagavya 3%

### Input Utilization Pattern in Cashew Cultivation

The resource poor farmers in the study area don t use any input except grafted cashew plants. This might be due to lack of technical knowledge. In this area, both rain fed and irrigated grown type of farming situations are existed. Even they don t use any irrigation for their crop, they only depend upon rain water, which ultimately reduces the fingure yield. They are unaware about the practice of pruning, foliar application and plant protection. They don't use of any organic input like organic manure, bio fertilizer, pesticides etc which can boost their yield. It was revealed from the study that majority of farmers were not applying FYM or organic manure. Hence, there is a need to create awareness in the farmers about the use of organic manures, pruning and foliar application. The demonstrations need to be conducted to educate the farmers to adopt recommended Integrated Crop Management (ICM).

### Results and Discussion

The cost and returns structure in Cashew cultivation (per ha) is presented in Table 3 and Figure 1. Of the total cost, the expenditure incurred on Cashew cultivation in an average Rs. 45480 Yield of Cashew crop was 191 quintals per ha. Labour, input, intercultural operations are accounted for the gross cost. Both budgeting and partial budgeting were presented in the table No. 4. The net income realized by the farmer is Rs.92, 480 for treated plot. Whereas, partial budgeting experimental plot realized Rs. 59,670. The BCR value for the both of 3.0 and 2.5 for budgeting and partial budgeting respectively. From the results there is an increased per cent of 20 was observed over the control.

The major constraints faced in cultivation of Cashew in the study area are presented in Table 4. The study revealed that the major problems faced by the growers in production are high cost of labour, non-availability of quality seed, lack of technical knowledge, financial obligation, inadequate market information and low productivity. The sample respondents ranked high cost of labour as the greatest constraint with a high score I. The problems ranked at second, third and fourth place were personal obligation with traders, financial weakness, lack of technical knowledge and lack of storage facilities respectively.

Cashew is one of the most important spice crops grown in Pudukkottai district; however the productivity is continuously decreasing year by year. Thus, there is need to increase the productivity to fulfill the domestic requirement and for export. Cashew cultivation is capital intensive and needs more investment. The small and medium size farmers of the study area are incapable to invest the required inputs and unable to bear more risks. It has been observed that technological interventions like foliar spray, swabbing with recommended chemicals and plant protection measures (Ohler, 1979) increased nut yield by 20- 25per cent at farmer's field and with the application of irrigation and foliar spray during December, January and February, the yield increased by 20 percent (Gibbon, 2001), but the farmers are not applying irrigation to the crop. To enhance the productivity, eco friendly production technologies among the farming community (Mayer, 1917) are the need of the hour.

**Table.1** The socio-economic profile of the Cashew growers of the study area. Socio-economic Profile of the Sample Respondents

| S.No. | Basic details | Difference | Score |
|---|---|---|---|
| **1.** | Age group of the farmers | 40-50<br>30-40<br>20-30 | 7<br>3<br>0 |
| **2.** | Education | 10<br>12<br>Degree | 3<br>6<br>1 |
| **3.** | Family Type | Join family<br>Single | 6<br>4 |
| **4.** | Family size | Small<br>Medium<br>Big | 4<br>3<br>3 |
| **5.** | Agriculture as occupation | Main | 10 |
| **6.** | Average Annual Income | 65,000 | |
| **7.** | Average area under Cashew | 4-7 ac | |
| **8.** | Growing pattern | Irrigated<br>Rain fed | 7<br>3 |
| **9.** | Soil pattern | Red<br>Sandy loam | 6<br>4 |

**Table.2** Labour and Other Utilization Pattern in Cashew Cultivation

| S.No. | Particulars | Man Days | Total |
|---|---|---|---|
| **1.** | Field preparation | 5 | 5 |
| **2.** | Ploughing (by bullocks) | 10 | 20 |
| **3.** | Pit forming | 12x5 | 60 |
| **4.** | Planting | 5x5 | 25 |
| **5.** | Pruning | 10x2 | 20 |
| **6.** | Plant protection | 2 | 2 |
| **7.** | Fertilizers & other foliar application | 4 | 4 |
| **8.** | Harvesting | 5x50 | 250 |
| **9.** | Drying & other | 3 | 3 |

**Fig.1** Majore Cashew growing blocks of Pudukkottai district.

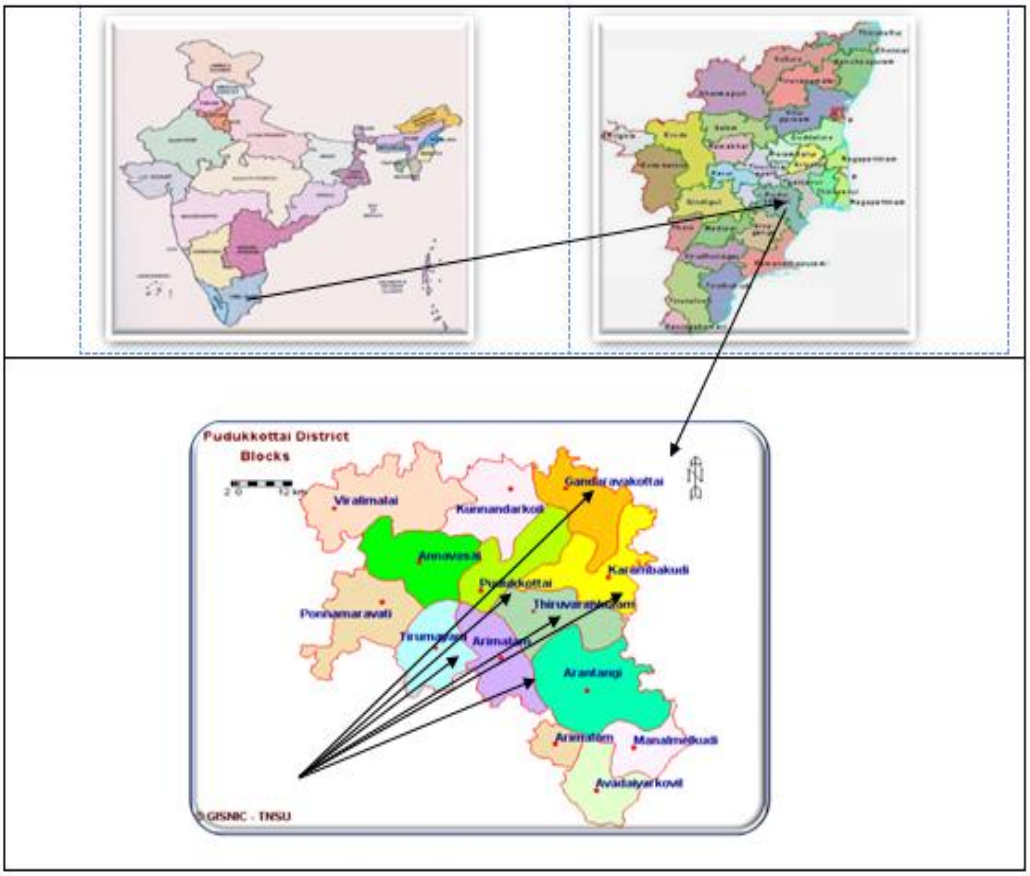


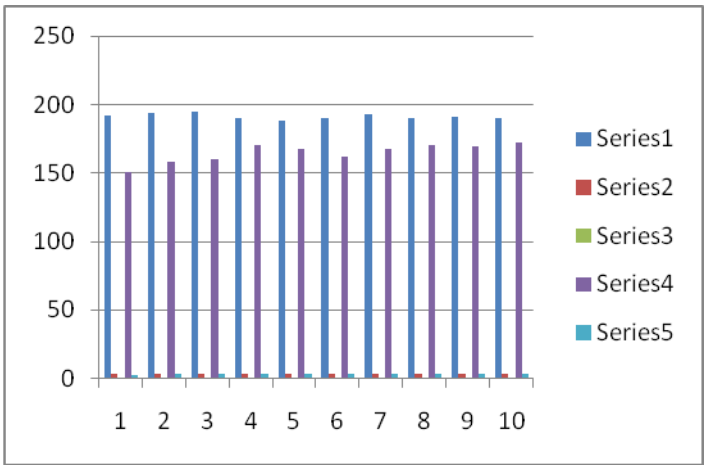

**Table.3** Cost and returns structure in Cashew cultivation (per Hectare)

| No. of farmers | Treated | | | | | Control | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Yield (Q) | Gross Cost | Gross Return | Net Return | BCR | Yield (Q) | Gross Cost | Gross Return | Net Return | BCR |
| **1.** | 192 | 48000 | 134400 | 86400 | 2.8 | 150 | 40000 | 90000 | 50000 | 2.3 |
| **2.** | 194 | 42000 | 135800 | 93800 | 3.2 | 158 | 38000 | 94800 | 56800 | 2.5 |
| **3.** | 195 | 43000 | 136500 | 111000 | 3.2 | 160 | 39500 | 96000 | 56500 | 2.4 |
| **4.** | 190 | 44000 | 133000 | 112000 | 3.0 | 170 | 37800 | 102000 | 64200 | 2.7 |
| **5.** | 188 | 45000 | 131600 | 86600 | 2.9 | 167 | 40000 | 100200 | 60200 | 2.5 |
| **6.** | 190 | 47000 | 133000 | 86000 | 2.8 | 162 | 39700 | 97200 | 57500 | 2.4 |
| **7.** | 193 | 46000 | 135100 | 89100 | 2.9 | 167 | 38200 | 100200 | 62000 | 2.6 |
| **8.** | 190 | 48000 | 133000 | 85000 | 2.8 | 170 | 39400 | 102000 | 62600 | 2.6 |
| **9.** | 191 | 47800 | 133700 | 85900 | 2.8 | 169 | 39400 | 101400 | 62000 | 2.6 |
| **10.** | 190 | 44000 | 133000 | 89000 | 3.0 | 172 | 38300 | 103200 | 64900 | 2.7 |
| **Max.** | 195 | 48000 | 136500 | 112000 | 3.2 | 172 | 40000 | 103200 | 64900 | 2.7 |
| **Mini.** | 188 | 42000 | 131600 | 85000 | 2.8 | 150 | 37800 | 90000 | 50000 | 2.3 |
| **Aver.** | **191.3** | **45480** | **133910** | **92480** | **3.0** | **165** | **39030** | **98700** | **59670** | **2.5** |

**Table.4** Constraints faced by cashew growers in the study area Constraints Score Rank

| S.No. | Particulars | Score |
|---|---|---|
| **1.** | High cost of labour | I |
| **2.** | Personal obligation with traders | II |
| **3.** | Financial weakness | III |
| **4.** | Lack of technical knowledge | IV |
| **5.** | 5 Lack of storage facilities | V |
| **6.** | Low productivity | VI |
| **7.** | Non availability of quality seed | VII |
| **8.** | Inadequate market information | VIII |

**Fig.2** Yield and Benefit Cost Ratio for Treated and Control of Cashew




The indigenous technical knowledge acquired by the farmers need to be tested and refined with the modern techniques of crop cultivation. Integrated Crop Management cultivation was found to be economical with a B:C ratio of 3.0.

Efforts should be made in the selection and production of improved released verities, identification of appropriate quantity and time of irrigation, training on application of organic input should be provided. From the study it was revealed that price of dried nuts with minimal processing fetches more price than raw nuts. Therefore, the farmers need to be encouraged to take up processing by themselves by giving them subsidy and/or loan for establishing the small scale processing units. Government should help the farmers to establish.

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