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## Studies on practicing organic coconut cultivation under drought conditions as a mitigation strategy

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### Abstract

India ranks third on world coconut production with 16.9 billion nuts from 1.89 m ha and it stands 1<sup>st</sup> in productivity having 7,779 nuts per hectare. The national average productivity of coconut in India is very low (around 40 nuts / palm / year). In order to have a sustainable coconut production against the threatening climate change issues, practicing organic farming is indispensable. The survey based research study was carried out in Tirupur district during 2013. The average water requirement of coconut is 60 lit/day. While on organic cultivation with proper management practices, tree requires 300 lit/10days. It will reduce to even low as if drip irrigation followed in the farm. Generally drip irrigation will save 30-70% of water usage for any crop. Hence practicing organic coconut cultivation is the only way to combat the drought and to achieve sustained production that will improve the socio-economical condition of the farmers.

**Keywords:** Organic coconut cultivation, organic practices, drip irrigation, drought

### Introduction

Historically, in the medieval period the coconut was known as *Nux indica*, the Indian nut, during the same period it was also referred as Nargil tree, “the tree of life”. Western literature mentioned the Malayalam name “Tenga” for the coconut palm which related to Tamil ‘Thennai’ and believed to have been introduced from Sri Lanka. There are two types of varieties of coconuts, i.e. Tall (West Coast Tall, Laccadive Ordinary, East Coast Tall and Andaman Ordinary) and Dwarf (Chowghat Green Dwarf, Chowghat Orange Dwarf, Gangabondam and Gudanjali Dwarf). The economic importance of this tree crop is evident from the fact that it is grown in more than 90 countries across the world in an area of 14.231 million hectares producing about 57.514 billion nuts or 10.52 million tonnes of copra. India ranks third on world coconut map and in recent times became the largest producer of coconut with the production of 16.9 billion nuts from acreage under plantation of about 1.89 million hectares. Even though India is among the largest producer of coconut with a distinction of having the highest productivity of 7779 nuts per hectare as against 3630 nuts per hectare in Indonesia and 3859 nuts per hectare in Philippines, the per capita annual availability of coconut estimated to have been 10 nuts only which is quite low compared to 222 of Philippines, 145 of Sri Lanka and 55 nuts of Indonesia (Source: Coconut Development Board). So, there is a need to develop cultivation practices for a sustained and higher productivity, which should also economically feasible to the farmers. Hence Practicing organic farming becomes indispensable to fight against these challenges and also to combat threatening climate change issues.

### Materials and Methods

This survey based research was carried out in Tirupur district during 2013 with the sample size consisting of 20 organic farmers and 20 inorganic farmers. The primary data were collected from the sample farmers by personal interview method. Based on the physical, cultural and socio-economic environment of farming in the study area, interview schedule was designed, pre-tested and finalized. A reconnaissance survey of the area was undertaken to explore the possibility of conducting the study. Information on family composition, size of the holding, area under various crops, inventory of resources, cropping pattern, extent of farm inputs used, cost and returns of growing coconut and organic coconut, problems faced by coconut growers were obtained. We had chosen twenty farmers each from organic and inorganic coconut growers for the survey in Tirupur region. Conventional/percentage analysis Garrett ranking technique, Regression analysis, Feasibility analysis and SWOT analysis were the tools used for data analysis.

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## Results and Discussion

The major socio-economic features in which this crop is cultivated include predominance of small and marginal holdings, medium to resource poor farm environment and less marketable surplus. The national average productivity of coconut in India is very low (around 40 nuts / palm / year). Declining productivity is attributed to the exhaustion of nutrients from soil due to continuous mining of nutrients by the palm without sufficient nutrients inputs. Hence in order to have a sustainable coconut production, practising organic farming is indispensable. Application of organic manures such as vermicompost, crop biomass, raising and incorporation of green manure legumes in coconut basins, green leaf manures such as neem, pungam, glyricidia, bio-fertilizers, cultural practices like mulching, half moon bunding, catch pit preparation etc., are some of effective low cost organic practices which are effective in utilization of natural resources for enhancing coconut production in a sustainable manner.

Under organic farming, physical, chemical and biological properties of soil are improved by various practices like application of organic manures, mulching etc., Application of organic manures improves soil bulk density, soil organic matter content, water holding capacity and soil micro & macro fauna population. Cultural practices like mulching and intercropping, yields and saves more per unit drop of water. The average water requirement of coconut is 60lit/day. While on organic cultivation with proper mulching practices, tree requires 300lit/10days. So, the monthly requirement in conventional farming is 1800lit/month but, organic practices require only 900lit/month. Adopting drip irrigation and

pitcher pot irrigation method especially for dry areas are more advisable.

Mulching is the main practice that has to be done as first step in conversion of organic farming. It increases the water holding capacity of the soil & multiplication of microorganisms, improves soil structure, texture and biodiversity. It provides favourable conditions for earthworms and prevents its movement to others farms.

Vermicompost consists of all the 16 nutrients which are required by plants. The business motive persons take this as an advantage and earn more money by production of vermicompost. This adds an additional cost of production to farmers who purchases from the market. A farmer who is practicing organic production can adopt *insitu* vermiculture in their farm which much lowers the cost of production. *Insitu* vermiculture means, culturing earthworms in the field itself, by releasing earthworms @ 100gm/coconut tree (4 lac /acre). The released earthworms later multiplies and gives vermicompost of 6 tons/acre. Mulching is to be done to prevent the movement of earthworms to other farms which are having high moisture content. This mulching subsequently improves the soil properties and increases soil micro and macro fauna multiplication. A fertile farm should have 4lac earthworms/acre.

Profitable intercrops for coconut are nutmeg, cocoa and banana. Although nutmeg stands first as profitable crop, the cocoa is the best suited intercrop for coconut farm which needs less care (excludes young stage) and increases organic humus content as it has highly leaves withering nature. It also increases 25% of coconut nut yield.

**Table 1:** Feasibility analysis of organic coconut cultivation (percentage analysis)

| S. No | Particulars               | Production cost per acre |       |           |       |
|-------|---------------------------|--------------------------|-------|-----------|-------|
|       |                           | Organic                  | %     | Inorganic | %     |
| 1.    | Manures                   | 0                        | 0     | 6,000     | 15.13 |
| 2.    | Irrigation management     | 5,000                    | 22.08 | 15,000    | 37.83 |
| 3.    | Intercultural operations  | 14,000                   | 61.81 | 12,500    | 31.53 |
| 4.    | Plant protection measures | 500                      | 2.21  | 3,000     | 7.57  |
| 5.    | Harvesting                | 3,150                    | 13.91 | 3,150     | 7.94  |
| Total |                           | 22,650                   | 100   | 39,650    | 100   |

**Table 2:** Feasibility and economics analysis of organic coconut cultivation

| S. No | Particulars              | Organic | Inorganic |
|-------|--------------------------|---------|-----------|
| 1.    | No. of trees             | 70      | 70        |
| 2.    | No. of nuts per tree     | 180     | 150       |
| 3.    | No. of nuts/acre         | 12,600  | 10,500    |
| 4.    | Price of nut             | 7       | 7         |
| 5.    | Weight of Copra/100 nuts | 18 kg   | 15 kg     |
| 6.    | Weight of copra/acre     | 2,268   | 1,575     |
| 7.    | Price of copra           | 43      | 43        |
| 8.    | Income/acre (Rs.)        | 97,524  | 67,725    |

## Conclusion

From the light of above facts, it can be concluded that, if 3<sup>rd</sup> world war would arose, it will be mainly for water scarcity. To fight against forthcoming drought, organic agriculture will be the alternative solution and hence the organic coconut production is sustainable over a longer period of time with increased production, quality that is feasible and adoptable by the farmers for releasing more profit by social economic means.

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