

# Doubling the farmers income through coconut farming by intercropping of turmeric: a profitable spice crop under coconut garden

P. P. Bhalerao<sup>1\*</sup> and H. P. Maheswarappa<sup>2</sup>

AICRP on Palms, Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, NAU, Navsari, Gujarat, <sup>2</sup>ICAR- Central Plantation Crops Research Institute, Kasaragod, Kerala

Coconut (*Cocos nucifera* L.) is the major plantation crop of coastal India which is often remunerative under crop diversification. Coconut farming provides livelihood security to several millions of people across the world and the capacity of coconut in providing improved nutrition, employment and income generation are well known. The coconut palm exerts a profound influence on the rural economy of the many states where it is grown extensively and provides sustenance to

more than 10 million people in the country. The processing and related activities centered on the crop generate employment opportunities for over three million people in India. Since coconut growers are more exposed to economic risks due to fluctuating market price, biotic-abiotic stresses, only systematic coconut-based cropping and farming system make it an economically viable crop in small holdings.

## Cropping/farming systems

Coconut interspaces provide

ample scope for mixed and intercropping and about 70-75% of the plantation area can be utilized for cropping systems. The pioneering effort of ICAR-CPCRI and All India Crop Research Project has resulted in the development of technologies for coconut based inter/mixed, multi-storied, multi-species cropping systems and these are being widely adopted by the farmers. The high-density multi-species cropping system and coconut-based mixed farming system, involving annuals/



biennials/perennials grown in different tiers by exploiting soil and air space more efficiently and integrating with poultry and animal husbandry, helps to maximize profits and can even buffer the price crash of the main crop. For maximizing economic returns, high value turmeric spice crop has been recommended in the palm-based cropping system. The net return per rupee invested from the cropping/farming system ranges from 1.7 to 2.7 and already proved by researchers that growing of turmeric crop in coconut improve the productivity of coconut. Many sustainable cropping system models incorporating various intercrops have been identified for coconut plantations that can provide more than 75% light intensity. Growing turmeric crops of higher market demand and requiring lesser light is a promising venture which can be effectively adopted in coconut plantations. Growing turmeric in the interspaces of coconut improved availability of soil moisture in coconut rhizosphere due to frequent irrigation which also resulted in reduced button shedding and increased fruit setting in such palms. Intercropping also encourages crop diversity, by providing habitat for a variety of insects and soil organisms that would not be present in a single-crop environment. This gives ample opportunity to grow turmeric as an intercrop in the coconut gardens. The recyclable biomass from coconut-based cropping system varies from 15-20 t/ha., which can be conveniently converted into vermicompost and can be recycled in the system, which will pave way for organic nutrition for

improving the health of the soil and for sustained productivity.

## Turmeric

Turmeric (*Curcuma longa L.*) commonly known as Haldi is an annual herbaceous plant and belongs to Zingiberaceae family. India is a leading producer and exporter of turmeric in the world. It is cultivated throughout India covering an area of 2.08 lakh hectares with an annual production of 1029 million tonnes and productivity of 5.1 metric tonnes per hectare. In India, Andhra Pradesh, Maharashtra, Orissa, Tamil Nadu, Karnataka, Gujarat and Kerala are the important states which cultivate turmeric. Although coconut area of coastal states has potential scope for cultivating turmeric, it has not been done commercially but for few farms. Utilization of available inter space in coconut which is otherwise fallow by cultivating improved varieties of turmeric will fetch good profit to the coconut farmers.

## Varieties

A number of cultivars are available in the country and are known mostly by the name of locality where they are cultivated. Some popular cultivars suitable for cultivation are : Suvarna, Suguna, CO-1, BSR-1, Sugandham, Roma, Suroma, Rajendra Sonia, Krishna, IISR Prabha, IISR Prathibha, Salem, Kesar, GNT-1, GNT-2 etc.

## Improved package of practices for cultivation of turmeric under coconut garden

### ► 1. Land preparation and planting

The land is prepared with the receipt of early monsoon showers, wherein soil is brought to a fine tilth by giving about one deep ploughing. The ideal time of planting would be the month of May or upto last week of June. Immediately with the receipt of pre-monsoon showers, beds of 1.0 m width, 15 cm height and of convenient length are prepared with spacing of 50 cm between beds. Planting is also done by forming ridges and furrows.

### ► 2. Seed material

Whole or split mother and finger rhizomes are used for planting and well developed healthy and





disease free rhizomes are to be selected. The planting should be done on the beds with a spacing of 30 cm x 15 cm. The optimum spacing in furrows and ridges is 45-60 cm between the rows and 25 cm between the plants. A seed rate of 800-1000 kg of rhizomes is required for planting one hectare of turmeric under coconut garden.

► **3. Manuring and fertilizer application**

Farm Yard Manure (FYM) or compost @ 20-25 t/ha is applied by broadcasting and ploughed at the time of preparation of land or as basal dressing by spreading over the beds or in to the pits at the time of planting. Fertilizers @ 60 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 60kg K<sub>2</sub>O per hectare are to be applied in split doses i. e. 60 kg P and K may be applied at the time of planting (basal) and 30 kg of N is apply at 30 DAS and remaining half dose of N may be applied at 60 DAS. The other organic manures like Neem cake or castor cake may also be applied @ 200

kg/ha at the time of planting. In such case, the dosage of FYM can be reduced. Integrated application of coir compost (@ 2.5 t/ha) combined with FYM, biofertilizer (Azospirillum) and half recommended dose of NPK is also recommended.

► **4. Mulching**

The crop is to be mulched immediately after germination with green leaves or sunhemp green manure or paddy straw @ 12-15 t/ha.

► **5. Weeding and irrigation**

Weeding has to be done thrice at 60, 90 and 120 days after planting depending upon weed intensity. In the case of irrigated crop, depending upon the weather and soil conditions, about 15 to 23 irrigations are to be given in clayey soils and 8-13 irrigations in black soil.

► **6. Harvesting and Yield**

Depending upon the variety, the crop becomes ready for harvest in 7-9 months after

**Coconut garden offers tremendous scope for intercropping with turmeric, the shade loving crop, which possesses sustained demand. Agro climatic condition congenial for coconut-turmeric cultivation is vastly available in South.**

planting during January-March. Early variety mature in 7-8 months, medium varieties in 8-9 months and late varieties after 9 months. Yellowing and drying of leaves are the signs of crop maturity. The land is ploughed and the rhizomes are collected by hand picking or the clumps are carefully lifted with a spade. The harvested rhizomes are cleared of mud and other extraneous matter adhering to them. The yield of turmeric depend on soil type, management practices etc. but the average yield of turmeric under coconut garden is about

10-12 t/ha in Gujarat coastal region.

### 7. Estimated income from turmeric as an intercrop in coconut

At AICRP on Palms centre, Navsari, turmeric was grown as intercrop in coconut garden. The expected yield of turmeric under coconut garden is about 10-12 t/ha, and as per the present price @ Rs. 15-20 per kg for turmeric, the minimum average additional gross income per hectare of turmeric is Rs. 1,50,000/- per year which is an additional income besides regular income from coconut. If the rhizomes and fingers (seed material) are processed to powder form and can be sold in market @ Rs. 150-200 per kg. The main crop i.e. coconut gives an gross income of Rs. 1,43,500 (@ 82 nuts per palm per year and @ Rs. 10 at the present price of coconut). In addition, turmeric adds valuable biomass like leaves which can be utilized

Economics of coconut- turmeric cropping system (Rs./ha)	
Cost of production	114000 [78000(Coconut)+66000(Turmeric)]
Gross income	218500 [143500(Coconut)+150000(Turmeric)]
Net income	149000 [65500 (Coconut) +84000 (Turmeric)]

for composting and recycling in the system thus reducing fertilizer costs.

Thus, coconut garden offers tremendous scope for intercropping with turmeric, the shade loving crop, which possesses sustained demand. Agro climatic condition congenial for coconut-turmeric cultivation is vastly available in South as well as few pockets of Saurashtra region of Gujarat state.

1\* Corresponding author - (pankaj5bhalerao@rediffmail.com) ■

## Coconut Based Technologies for Commercialization

The CSIR-CFTRI, Mysore has developed the following coconut based technologies in collaboration with Coconut Development Board, Kochi which are available for transfer to the entrepreneurs/stakeholders are as follows:-

S.No	Name of Technology
1	Coconut Beverage from tender coconut
2	Tender coconut water concentrate with sugar
3	Value added products from Coconut - Instant Adjunct Mix, Instant Filling Mix, Coconut Rice Mix, Coconut Bites
4	Production of Blends of Coconut oil with other edible oils
5	Desiccated coconut
6	Spray dried coconut milk powder
7	Production of Coconut Spread based on Mature coconut water concentrate and coconut dietary fibre
8	Virgin coconut oil
9	Neera bottling
10	Improved process for preservation of Neera (Pet bottles)
11	Neera concentrate
12	For basket of two (Improved process for preservation of Neera (Pet bottles) + Neera concentrate)

For availing the benefits of these technologies, interested entrepreneurs/ stakeholders can participate in the interface/technology transfer meets to be conducted at CFTRI, Mysore. Interested parties may register their names with CDB at the earliest.

Address:- Coconut Development Board, Government of India, Ministry of Agriculture & Farmers Welfare, P.B. No.1021, Kera Bhavan, SRV Road (Near SRV High School), Kochi – 682 011, Ernakulam District, Kerala State, India. Phone:0484-2376265//2377266/2377267/2376553, Website: www.coconutboard.gov.in, Email : cdbtech@gmail.com,

Contact Person: - Shri. Sreekumar Poduval, Deputy Director Technology Development & Entrepreneurship, CDB Institute of Technology (CIT), Technology Development Centre and Quality Testing Laboratory, Vazhakulam, Aluva, Kochi, Kerala, (0484 2679680, citaluva@gmail.com)