



# Pineapple-

## a profitable fruit intercrop for coconut farmers

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### Introduction

Among the plantation crops, coconut is the major crop grown both under plantation and homestead management system. It 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. Coconut is a major plantation crop of coastal India covering an area of 2.18 million ha which is predominantly cultivated in small and marginal holdings. 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 CPCRI 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 pineapple fruit 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. It has been already proved by researchers that growing of pineapple crop in coconut improves the productivity of coconut. But this needs supply of irrigation for the component crops. Coconut is an irrigated crop in many states. This gives ample opportunity to grow pineapple as an intercrop in the coconut gardens. The recyclable biomass from coconut-based cropping system varies from 15-20 t/ha. This can be conveniently utilized as vermicompost which can reduce the requirement of chemical input

to the system. This will pave way for organic farming for improving the health of the soil and for sustained productivity.

## Pineapple

The pineapple (*Ananas comosus* (L.) Merr.) is one of the leading commercial fruit crops of the tropics. Pineapple is also a commercially important fruit crop of India with around 90,000 ha area under this crop, 15.27 lakh tonnes annual production and 15.3 tonnes /ha productivity (Anonymous, 2018). It is one of the choicest fruit all over the world because of its pleasant taste and flavour. Pineapple is a good source of vitamin A and B and fairly rich in vitamin C and minerals like calcium, magnesium, potassium and iron. It is also a source of bromelain, a digestive enzyme. Pineapple is a hardy plant; requires very less water and hence suitable for most parts in coastal and inlands of south India. The major pineapple producing states in India are Assam, West Bengal, Karnataka, Meghalaya, Manipur, Arunachal Pradesh, Kerala and Bihar. Currently, India produces 1.53 million tonnes of pineapple with productivity of 15.3 t/ha. Although coconut area of coastal states has potential scope for cultivating pineapple, 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 pineapples will fetch good profit to the coconut farmers.

## Varieties

Kew, Giant kew, Charlotte Rothschild, Champaka, Mauritius, Red Spanish, Queen, Ripley Queen, Victoria are varieties of pineapple suitable for cultivation.

## Improved package of practices for cultivation of pineapple under coconut

### ► Land preparation

The field should be well-ploughed and made to fine tilth. The ideal time of planting would be April-May or August to October in order to avoid harvests during rainy seasons.

### ► Planting method

The propagation materials used are suckers and slips. Uniform sized slips weighing around 350g are used for planting. Suckers and slips are usually preferred for planting since they flower comparatively earlier than crown. The suckers are



planted in trenches with a spacing of 90x60x30 cm to accommodate 43,500 plants/hectare as a sole or main crop. In Goa, the local variety is planted as intercrop in slopes under partial shade of cashew and other wild trees, accommodating around 20,000 plants / hectare.

### ► Manures and fertilizers

Pineapple is a shallow feeder with high N and K requirement. A dose of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O at 12, 4 and 12g/plant/year respectively is optimum for pineapple cultivation. Application of fertilizer under rain fed conditions should be done when moisture is available i.e. during monsoon season. (Table 1)

### ► Inter cultivation

Earthing up is an essential operation which result in good anchorage. It is more important in ratoon crop. Mulching is essential to conserve soil moisture as well to check weed growth. Spraying Glyphosate @ 4-5 ml/L or Diuron 2 4 ml/ l is recommended to control the weeds. Fruit weight increases with increasing number of suckers per plant, while more number of slips delays fruit maturity. Hence desuckering can be delayed as much as possible, while slips are recommended for removal as soon as they attain the size required for planting.

Table 1. Fertilizer schedule for soil application on pineapple

Month after planting	N g/plant /year	Urea g/plant /year	P <sub>2</sub> O <sub>5</sub> g/plant /year	Rock phosphate	K <sub>2</sub> O	MOP
0	-	-	4	13.5	-	-
2	2	4.4	-	-	-	-
4	2	4.4	-	--	-	-
6	2	4.4	-	-	6	36.0
8	2	4.4	-	-	-	-
10	2	4.4	-	-	-	-
12	2	4.4	-	-	6	36.0
Total	12	26.40	4	13.5	12	72.0

## Flower regulation using growth regulators

Normally, pineapple flowers 10-12 months after planting and fruits are ready for harvest after 5-6 months of flowering. Besides the time of planting, flower induction practices with certain chemicals or growth regulators influence the season of harvest. The planting and flower induction schedule can be planned as follows so as to accomplish staggered harvest and unbroken market availability throughout the season ie from October to May.

Table 2: Flower regulation for staggered harvests

Month of Planting (1 year)	Month of application of growth regulators in the 2 year	Months taken for flower induction	Harvesting month
April	March -April	1-2	October-November
May	April-May	1-2	November - December
August	July-August	1-2	February-March
September	August-September	1-2	March -April
October	September-October	1-2	April- May
November	October-November	1-2	May-June

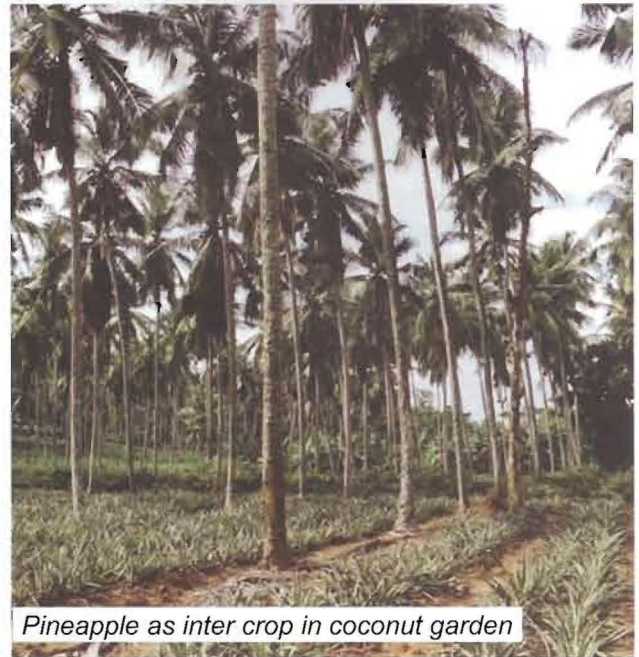
Although, growth regulators or chemicals can induce flowering at any stage of the plant growth, forcing the plants to produce flowers at an early stage reduces fruit size. Therefore, when plants of optimum size (35- 40 fully grown and active leaves) are induced to flower, better fruit size is obtained without any adverse effects on the ratoon crop.

## Harvesting and yield

Pineapple plants flower 10-12 months after planting and fruits become ready 15-18 months after planting.

Table 3: Yield potential of pineapple varieties evaluated

Variety/Yield	Main crop (t/ha)	Ratoon crop (t/ha)
Giant Kew	90-100	60-65
Queen	75-80	50-60
Local	50-60	40-45



Pineapple as inter crop in coconut garden

## Estimated income from pineapple intercrop

The estimated income from main crop of 'Giant Kew' variety grown in one ha. coconut plantation would be around Rs. 3 to 4 lakhs from 49.27 tonnes (Rs. 8/- per kg average wholesale price for pineapple during 2016; NHB). In first and second ratoon crops, income would be Rs. 2-3 lakhs and Rs. 1 lakhs/- from 36.84 and 16.88 tonnes /ha yield, respectively. This is an additional income besides regular income from coconut. The additional side suckers and slips produced also fetch margin to the farmers. The cost of suckers varies from Rs 2 to Rs 4 per sucker. Pineapple biomass like leaves and crowns can be utilized for composting and recycling nutrients thus reducing fertilizer costs. Pineapple biomass can be a better and easier material to extract bioethanol than from other sources like algae and fish biomass (Abu Osman et al, 2012).

**References** ● 1. Abu Osman, N, A., F. Ibrahim, W.A.B. Wan Abas, H.S. Abd Rahman, H.N. Ting. 2008. Bio-ethanol production from agricultural waste biomass as a renewable bio-energy resource in biomaterials. *Biomed 2008, Proceedings 21*, pp. 300–305. ● 2. Annual report, 2017. ICAR- Central Plantation Crops Research Institute, Kasargod, Kerala ● 3. National Horticulture Board. 2018. *Indian Horticulture database*. ([www.nhb.gov.in](http://www.nhb.gov.in)) ● 4. S. Priya Devi, M. Thangam, M. S. Ladaniya, N. P. Singh (2013): Pineapple-a profitable fruit for Goa. *Technical Bulletin No. 35*, ICAR (RC), Goa. ● 5. [www.agritech.tnau.ac.in/expert\\_system/coconut/coconut/coconut\\_main\\_field.html](http://www.agritech.tnau.ac.in/expert_system/coconut/coconut/coconut_main_field.html). ■