



# Coconut + Cocoa intercropping

## for doubling farmer's income

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Coconut is one of the traditional plantation crops of coastal Andhra Pradesh. The coast line of Andhra Pradesh is located on the south east coast of Indian peninsula with 974 km coastal corridor spread along 9 districts viz., Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore. This coast line is having humid tropical climate with 800 to 1200 mm annual rainfall, minimum temperature ranging from 15-20<sup>0</sup>C, maximum temperature ranging from 30 to 35<sup>0</sup>C and 60 to 75% relative humidity. This climate is suitable for plantation crops like coconut, oil palm and cocoa with assured irrigation facilities. Within the state some area of coconut is under rain fed particularly north coastal 3 districts. East and West Godavari are the two major districts covering almost 60% of coconut area of the state. As Coconut is "Kalpavriksha" due to its multipurpose uses, farmers cultivate coconut as traditional crop. At present copra, tender nut and fiber are the main source of income to coconut farmers in Andhra Pradesh. Due to low productivity, price fluctuations, aged plantations, lack of harvesting machinery and lack of awareness about post harvest value added products technology has caused unstable income per unit area for coconut farmers. The net income per unit area in coconut plantation need to be increased. This can be achieved by increasing land use efficiency with inter cropping. Among the different crops, cocoa is one of the best suited inter crop for coconut to exploit natural resources like sun light, land and water.



- Climatic requirement of cocoa (inter crop) and coconut (base crop) is almost similar.
- There is no competition for solar radiation as cocoa is a shade loving crop that can be grown in 40-80 % shade.
- There is no competition for water and nutrients as these two crops are having different type of root systems spread in varying depths of soil.
- Cocoa is a perennial crop
- Pest and disease problems in both the crops won't affect each other.
- Field operations like pruning and harvesting dose not interfere with each other.

## Advantages of cocoa as an inter crop in coconut

- Cocoa adds lot of leaf biomass to soil which improves soil organic matter.
- Leaf litter acts as mulch for soil moisture conservation and also for weed control.
- Good yield potential.
- Long term storability of cocoa beans.
- Assured marketing facilities.
- Export potential of cocoa beans.
- Create round the year employment, particularly for women.
- Highly remunerative crop.
- Feasibility for processing and value addition in small scale.
- Popularly Kerala Agricultural University cocoa varieties (Seed pods from clonal gardens) are being raised by Andhra Pradesh farmers. Seedlings were raised by mondazole pvt. Ltd. Formerly cadbury's India Ltd and supply to farmers on subsidy basis.

### Success story of farmers from East and West Godavari Districts

#### **Kanamathareddi Venkata Sunitha,**

Village: Vijayarai, Mandal: Pedavegi, District: West Godavari.

Kanamathareddi Venkata Sunitha having 35 year old coconut orchard in which she planted cocoa in the year 2008. Cocoa was planted at 2.5x2.7m spacing. She used panchagavya as an organic source in manurial management. Yielding of cocoa plantation started from the fourth year onwards. During fourth year she got one quintal yield and during fifth year she got two quintal yield. For the last two years she is getting eight quintal per ha. She is getting net income of Rs. 55000/@ha. from coconut and Rs.87500/@ha. from cocoa. Overall from coconut+cocoa intercropping she is getting Rs.1,42,500/@ha.. She is giving employment for women labour for 200 man days in a year. Because of cocoa plantation, the weed problem in her garden was completely solved and she is getting satisfactory income from cocoa inter crop.





### Nagabirava Dasarada Ramayya

Village: Vijayarai, Mandal: Pedavegi, District: West Godavari.

Nagabirava Dasarada Ramayya is having 37 year old coconut orchard. He planted cocoa as an inter crop in the year 2004 and now the cocoa is 13 years old. He is doing pruning twice in a year during June-July (first pruning) and October (second pruning). Fertilizers are applied in four splits in a year with 500:500:500 g of Urea, SSP and MOP along with 1kg vermicompost per plant per year. He is getting 110 nuts from coconut and nine quintal cocoa beans @ha. per year. He is getting net income of Rs.53000@ha. from coconut and Rs.1,17,500/@ha. from cocoa. Overall from coconut+cocoa intercropping he is getting Rs.1,70,500/- ha-1. He has adopted low cost vermicomposting in the inter rows of cocoa plants. He was having regular zinc deficiency problem in cocoa orchard, for which two micronutrient foliar sprays in a year and soil application of zinc @50g per plant per year are being followed. For the last five years hairy caterpillar and mealy bug were the main pests observed in his field, for which one protected spray with chloripyriphos prior to flowering and second spray with acephate after peak flowering and fruit setting stage was done. Last year he observed a new pest viz cocoa pod borer, where the pest bore a single hole near the fruit stalk portion and enter into the fruit. Because of this insect incidence cocoa beans became very hard and there was no mucilage for fermenting the beans.



### Jasthi Rajan Babu

Village: Jaganadhapuram, Mandal: Pedavegi, District: West Godavari, Andhra Pradesh.

Jasthi Rajan Babu is having 31 year old age coconut garden. He planted cocoa as inter crop in his coconut garden in the year 1991. Coconut was planted at 8mx8m spacing with the plant population of 156 palms per ha. Now cocoa is 26 years old. He is getting 90-100 nuts per palm from coconut on an average. He is getting Rs. 55,000 @ha. net income from coconut. In cocoa he is getting nine quintal @ha. average yield with net profit of Rs. 1, 20, 000/@ha. Coconut + cocoa gives overall net income of Rs. 1, 75, 000/- @ha. The fertilizers were applied to cocoa and coconut in two split doses in the months of July- August and November-December. Pruning was done mainly after main harvest particularly after two rains in the months of June-July. Irrigation was given through micro irrigation. Plant protection measures were not undertaken in his field but during the last four years, because of sucking pest problems, he started 3-4 sprays of insecticides per year.



## Raju

Village: Velagadurru, Mandal: Undrajavaram, District: West Godavari

Raju is having 42 year old coconut plantation from which he is getting 55,000 nuts from 600 palms with a net income of Rs. 42,000 from a hectare. He planted cocoa in the year 1986 in his 10 year old coconut plantation and now the cocoa plantation is 32 years old. He is getting 15 quintal cocoa bean @ha. with a net income of Rs. 2,20,000@ha. Overall from coconut + cocoa intercropping he is getting net income of Rs. 2,62,000@ha. He is using bio-fertilizes along with organic manures. He removes off season flowering to get high quality and good yield in the main season during February to April.



## Remalla Madhusudana Rao

Village: Veeravaram, Mandal: Kadiyam, District: East Godavari

Remalla Madhusudana Rao is growing coconut for the last 38 year. He planted cocoa in 1995 in his 15 year old coconut plantation. He planted 200 cocoa seedlings per acre. He was doing pruning once in a year during June-July. Fertilizers were applied in two splits in a year with 250:250:250 g of Urea, SSP and MOP along with 10kg FYM per plant per year. He is getting yield of 120 nuts from coconut and 15 quintal @ha. cocoa beans per year. He is getting net income of Rs.34000/@ha. from coconut and Rs.2,25,000/@ha. from cocoa and overall from coconut + cocoa intercropping he is getting Rs. 2,59,000/@ha. per annum. He has adopted composting of cocoa biomass every year in the inter rows.

### Farmer's problems at field level

- Natural calamities like cyclones during flowering and fruit setting stage affect yield of cocoa.
- Shortage of women labour for cocoa harvesting.
- Regular and severe incidence of black hairy caterpillar and mealy bugs.
- Damage of ripen pods by rodents, squirrels and monkeys
- Problems at field level with diseases like black pod rot and cherelle wilt.

### Retirement



Shri. G Balakrishna Kurup retired from the services of Coconut Development Board on 31<sup>st</sup> October 2017 on superannuation. He joined the Board in April 1982



Shri. K S Ajithkumar retired from the services of Coconut Development Board on 31<sup>st</sup> October 2017 on superannuation. He has rendered more than 23 years of service in the Board.