



COCONUT BASED CROPPING SYSTEM MODEL FOR GOA STATE WITH PINEAPPLE AND PASSION FRUIT AS INTERCROPS

Technology developed by : Dr. V Arunachalam, Principal Scientist (Horticulture)
Dr. Paramesha, V., Scientist (Agronomy)

PROBLEM AND RESEARCH GAP

The erect morphological character of coconut palm necessitates its planting in wider spaces and not all the soil and solar radiation are utilized by the coconut palms due to the rooting pattern. For more income generation and better utilization of resources, multispecies cropping of variety of crop is beneficial in initial and after 25 years of coconut plantation hence, in coconut plantations, intercropping is practiced for efficient utilization of resources and enhancing income generation and employment. Coconut based cropping system with fruit crops perform well without harming coconut production. A suitable intercrop combination catering to local food and market needs and suiting agro-climatic and edaphic situation is important. Hence research is needed to identify proper cropping system model for coconut farmers of Goa state.

PARTICULARS AND SALIENT FINDINGS

The study was conducted at ICAR-CCARI, Goa with laterite soil. The main crop was coconut (cultivar: Benaulim Tall) 28 years old planted at 7.5m × 7.5m spacing getting 175palms per hectare. The intercrops were planted in July 2015 with six different models and a monocropping as control as below

- T1: Coconut was intercropped with papaya and drumstick combination. Two rows of papaya (at 4m spacing) with four plants each was spaced with four drumstick plants at 2m spacing between the plants.
- T2: Coconut was intercropped with heliconia having 16 heliconia matt at 2×1m spacing.
- T3: Coconut was intercropped with four lemon plants at 3m spacing having six banana plants in between at 3.5×3m spacing.
- T4: Coconut was intercropped with pineapple and passion fruit combination, where two rows of pineapple (14×3 plants each at 0.5 m x 0.5 m spacing) were spaced with two passion fruit plants at the corners with 6.5m spacing.
- T5: Coconut was intercropped with four soursop plants at 3m spacing.
- T6: Coconut was intercropped with 25 crossandra plants at 1m spacing.
- T7: Coconut monocrop.
- An additional average coconut equivalent yield of 8605 nuts per ha per year is obtained after intercropping coconut with pineapple and passion fruit. Intercropping with pineapple and passion fruit in coconut plantation gave coconut equivalent yield of 19587 nuts per hectare of over monocropping of coconut with 10982 nuts per hectare.



IMPACT

The yield of coconut and intercrop was recorded each time after harvest for five years from 2016-2021. The coconut equivalent yield was calculated for each treatment from the revenue generated for the intercrop (yield × rate of the intercrop) for each year divided by the rate of the coconut. The total gross return was calculated (revenue generated from monocrop and intercrop). Net return is calculated from total gross return subtracted by the total cost involved in cultivation and maintenance of the crop based on the current market rates for manure, fertilizers, irrigation and other intercultural operations. The highest net return was recorded by the coconut + pineapple + passion fruit model (1,30,270/-) with a B:C ratio of 1.99. The net return for coconut monocrop was only Rs 60,220/- per ha with B:C ratio of 1.21. The cropping system model was evaluated for nutrient use efficiency and environmental impact analysis including global warming potential. The model was demonstrated in five locations at different locations of Goa state at farmer's fields owned by individuals and self help groups.

ACKNOWLEDGEMENT

- ICAR -AICRP (Palms) Goa center, Old Goa, Goa

REFERENCES

- Kumar, P, Arunachalam, V., Paramesha, V. and S. R. Maneesha. 2021. Diversified multitier cropping systems. Indian Farming 71(11): 32-36
- Arunachalam, V. and Salgaonkar, D.C. (2022) Evaluation of coconut-based cropping models in Goa. Poster (S3-PP2) presented at the National Symposium on Self reliant coastal agriculture 11-13 May 2022 ICAR Central Coastal Agricultural Research Institute, Ela Old Goa - 403402 Goa India. In: Kumar, P., Arunachalam, V., Das, B., Gokuldas, P.P., Rajkumar, S., Mayekar, T.S., Uthappa, A.R. (2022) Souvenir and abstracts of National Symposium on Self Reliant Coastal Agriculture 11-13 May 2022 ISBN 978-81-956638-3-5 page 115.