

CULTIVATION OF FODDER CROPS IN COCONUT GARDEN

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The coconut palm (*Cocos nucifera* L.) is commonly referred to as the "Tree of the Heaven" (Kalpa Vriksha), because of its usefulness and versatility. Coconut is predominantly a crop of the small growers in India. It is planted wide apart to accommodate the large canopy of the palm and minimise, if not avoid, overlapping of leaves of adjacent palms. The normal recommended spacing for the ordinary tall variety in India is 7.5 x 7.5 m. Under normal management condition, the roots of an adult, bearing palm growing in a medium textured soil are concentrated within a radius of 2m around the palms.

On surface area basis, the area of active root zone is 12.57 m². Therefore the fraction of land area effectively utilised by the palm is 22.24% only. Thus in a pure stand of coconut at normal planting density and management conditions, about 75% of the total area is not effectively utilised by

coconut palms. Per cent light interception by young palms (8-20 years age) is very high and it declines as age advances. In a coconut plantation aged over 20 years, only 40-45% of light is utilized efficiently and remaining is unutilised.

In order to utilise land, air space and light effectively, growing of inter/mixed crops suitable for a given area plays an important role in improving soil physico-chemical properties in addition to providing additional income and employment.

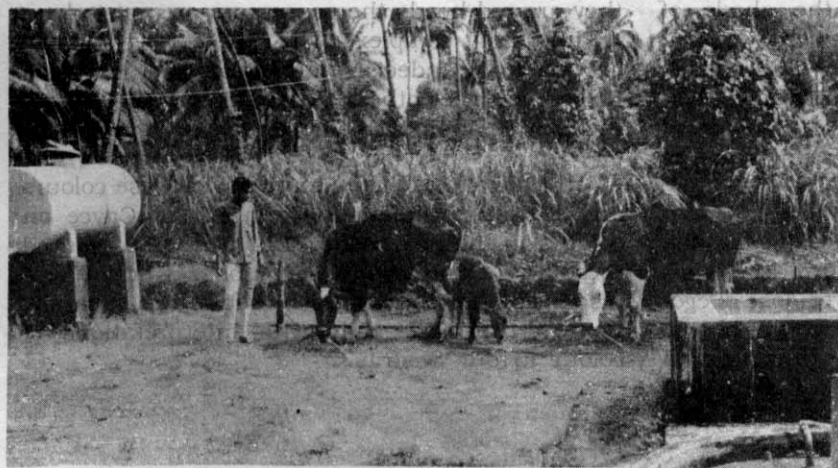
Nearly 40% of the area under coconut in Kerala is under homesteads, where farmers are growing various food, timber, spices and fruit crops in varying numbers but in a haphazard manner. As they are not systematically grown, many a time they compete with each other and yields are not realised to the fullest extent. Area under paddy in Kerala, is drastically coming down year after year. The weakest link of the dairy industry in Kerala is

the non-availability of fodder in summer months.

Many of the traditional farmers are hesitant to go for dairying as the cost of fodder is very high. Kerala is the State where land to man ratio is very narrow (0.19 ha), and hence finding a suitable area for growing fodder crops is impossible. Coconut being the second largest crop in terms of area next only to paddy, the interspace of this crop can be effectively utilised to grow various other crops. If we see the per capita availability of milk, it is very low (100 ml/day) compared to the recommended level of 200-250 ml. Keeping these points in mind, attempts have been made to find out the suitable fodder crops which can be effectively grown in the coconut interspaces at Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala.

The studies revealed that, among the fodder crops tried, Hybrid Napier grass, NB 21 and Guinea grass (*Panicum maximum*) are the most productive, yielding about 50 tonnes of green fodder per ha per year. Guinea grass has the capacity to withstand prolonged cloudy weather conditions prevailing in Malabar region during the rainy season. NB 21 gives good fodder yield under irrigation during summer season. From nutrition point of view, a milking cow needs on an average 30 Kg of green fodder per day in addition to one Kg of concentrate for every 2.5 to 3 litres of milk. So it is found that a farmer having fodder grass grown in one ha coconut garden can maintain 5-6 cows without any problem.

For planting grasses, slips are used as planting materials. First, trenches are dug to a depth of 30 cm with an intrarow spacing of 50 cm. In the trench, cowdung and entire dose



Mixed Farming

of P_2O_5 & K_2O (80 Kg each) should be placed and covered with soil. Later root slips should be planted within a row, at a spacing of 30 cm. After planting, earthing up should be done. Care should be taken to see that the basin of coconut palm with 2 m radius is kept free and clean. During summer months it is necessary to irrigate the crop once in a week with sprinkler/perfo irrigation system for efficient utilization of water. The crop will be ready for first cutting 75 days after planting. Cutting should be done by leaving 10-15 cm height from the bottom. After first cutting, 20 Kg Nitrogen in the form of urea should be applied as top dressing.

Subsequent cuttings can be taken up at an interval of 40-45 days. It is desirable to take up replanting after 3-4 years. In a year, six cuttings can be taken up, yielding on an average 150-160 Kg green grass per day. By maintaining 5-6 cows, 80-100 Kg cowdung can be obtained per day, of which, 25 Kg can be used for 3 m^3 biogas plant and remaining cowdung can be recycled back into coconut and fodder crops. Slurry coming out of biogas plant can be used as manure, as it contains better N P K than the cowdung.

To meet the protein requirement of the cattle, it is also suggested to grow fodder legumes like Lucerne, Stylosanthes, Desmodium and Cowpea along with the fodder grass. While feeding, fodder grass:legume should be in the ratio of 3:1. In many cases it is worthwhile to keep a hand operated grass cutting machine so as to avoid wastage of rejected stem etc., especially in case of NB 21, where grass can be chopped into smaller pieces and made as good hay for feeding cattle. *

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GREAT GERMANS

Alexander von Humboldt

(Born in Berlin on 14 Sept. 1769; died there on 6 May 1859)

After studying natural sciences and mining, Alexander von Humboldt started together with the French botanist A. Bonpland on an expedition to Venezuela, Cuba, Columbia, Ecuador, Peru, Mexico and the United States of America. Living in Paris after his return, he wrote between 1805 and 1834 his "Voyages aux regions equinoxiales du nouveau continent" in 36 volumes, thus establishing the subject of Plant-geography and a new approach to geographical research.



Jakob Fugger

(Founder of a Swabian trading lineage at the town of Augsburg; died 1469)

Since 1367 the amous lineage of this well-known and established trading family in the South German region of Swabia is known to have settled in Augsburg. Jakob Fugger was the ancestor of the line of the Fuggers and founder of the "Fuggersche Handelshaus" (The Fugger Trading House). His sons Ulrich 1441-1510), Georg (1453-1506) and Jakob II (1459-1525), "The Rich", established themselves as world traders and amassed extraordinary wealth, and social status. Already in 1505 Jakob II participated in the trade with the Indian region, and over the centuries the Fuggers became one of the leading trading and banking houses of Europe, till today.

Elisabeth, the Holy

(Born 1207 at Fort Saros Patak in Hungary; died 17. November 1231 in Marburg)

Elisabeth was daughter of Andreas II of Hungary and his wife Gertrud of Andechs-Merania and married, quite young, in 1221 the Count Ludwig IV of Thuringia. After the death of her husband as a crusader, she devoted her life entirely to the tending of the sick in a hospital founded by her in the town of Marburg on river Lahn, where she died. She was canonized four years after her death in 1235.



Johannes Gutenberg

(Born ca. 1397 in the city of Mainz; died 3 Febr. 1486 at Mainz)



After being born in Mainz, he is known to have lived in Strassbourg for some time. Since 1436 he was concerned with the problem of how to print, i.e., fasten the method of copying and distributing literary matter. And that is how he invented the first 'printing press'. Famous is the 42-line "Gutenberg Bibel" which is preserved in 47 copies. Later he developed types also for printing of astronomical charts and calendars and other religious and literary matters.