



Fodder as Intercrop in Coconut Garden under Mixed Farming System

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Coconut is a major plantation crop of coastal India covering an area of 1.97 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/farming system makes it an economically viable crop in small holdings. Mixed farming is a profitable enterprise in such coconut plantations. Inclusion of cattle in coconut based cropping system is a practical option for enhancing the income of coconut farmers. The live stock component in the unit serves as a complimentary entity to the system. It provides adequate supply of organic matter to the system and nutritional security to the farm family. Maintenance of animals in sustainable way requires including fodder grass production in the system. Green fodder is an important source of

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Trenches made at 60 cm for planting fodder slips

nutrition and roughage for dairy animals. The cost of fodder production can be reduced by substituting the nitrogen requirement through recycling of the organic wastes produced in the mixed farms.

Fodder grass in coconut plantations

India has one fourth of the world livestock population and the current fodder resources can meet only less than 50% of the requirement of livestock. Lack of cultivable land is one of the major constraints for increasing the area under fodder crops. Hybrid Bajra Napier can be profitably grown in the interspaces of coconut garden with 75% light intensity through nutrient recycling. It can be introduced as an intercrop in juvenile (0 to 3 years old) and old (more than 20 years) coconut plantations. Hybrid Bajra Napier (*Pennisetum glaucum* x *P. purpureum*) has wider acceptability among the farmers since it can be grown throughout the year under irrigated condition. The yield potential of green fodder is 150 to 200 t/ha with a crude protein of 9-12%. The improved varieties are CO 3, CO 4, CO 5, PBN 233, APBN 1.

Planting

Rooted slips from the vegetative tillers can be used as planting material. The soil in the interspaces of coconut should be made to a fine tilth. For this the land needs to be ploughed well to a depth of 45cm and leveled. Fodder grass intercropping can be done in 150 cents (60% area) of one hectare coconut plantation. Planting can be done immediately after the receipt of monsoon showers (May to June or September to October). It is better to avoid the planting during the dry periods of the year (February to April).

Grass slips are to be planted at a spacing of 60 cm

in the trenches made at a distance of 2m from the basin of the palms. The trenches are to be made at 60cm apart and applied with basal dose of farm yard manure (25 t/ha) and inorganic fertilizers (90:30:24 kg NPK per ha of coconut plantation).

After cultivation practices

Fodder grass requires a moist ecosystem for proper establishment. For this, sprinkler irrigation facility can be provided in the system. At

least two irrigations can be given within seven to ten days after planting for easy establishment of the crop. It requires subsequent irrigation depending upon rainfall and soil type. Irrigation with cowshed washing (once in 3 to 4 days interval) is a better option for robust growth and effective recycling of nutrients. The cowshed wash water can be collected in tanks (2.4 m x 2.4m) and utilized for irrigating the fodder grass for better water use efficiency. The newly emerging shoots from the slips needs to be protected from weeds for the first two months.

Harvesting and manuring

The first cut is usually done at 75 days after planting and subsequent cuttings are taken at 45 to 60 days interval. The harvesting interval is more during the winter season (December to February). Cutting is done at 15 to 20 cm from the ground level. After every harvest the fodder grass is supplied with nitrogenous fertilizers. For organic fodder production nutrients can be supplied through cowdung slurry (250 ml/clump) and vermicompost (125g/clump) in two equal splits i.e; immediately after harvest and 15 days later. Application of *Azospirillum* (3.5 kg/ha/yr) along with the organics during June and September enhances the nutrient use efficiency. The farm wastes produced in the unit (approx. 14t/ha) can be effectively recycled to vermicompost using earthworms (*Eudrillus* sp) with around 60% recovery. This process helps in the recycling of the wastes in the system to organic nutrients.

Economics of cultivation

About six to seven harvests can be made in a year. Studies conducted at ICAR-Central Plantation Crops Research Institute, Regional Station, Kayamkulam reveals that this system of cultivation recorded a sustainable production of 126 t/ha/year of fodder grass in every year for a period of three years.

New Executive Councillors for Indian Society for Plantation Crops, ICAR-CPCRI

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Replanting of fodder grass is recommended once in every three years. Considering the cost of fresh fodder as Rs.3/kg, a net return of Rs.2.5 lakh (cost benefit ratio of 1: 2.5) can be generated from the fodder as intercrop. With the available fodder, 10 to 12 milch cows can be introduced in to one hectare of coconut based farming system. This can generate a net income of Rs.4.5 lakhs per year (cost benefit ratio of 1: 1.7) to the farmer, apart from 10% average yield



General view of the experimental field

enhancement resulting in additional income from coconut. For small and marginal farmers inclusion of one or two milch cows into the system ensures nutritional security to the farm family. It also provides adequate organic matter for effective and sustainable nutrient recycling in the system.

Conclusion

Hybrid Bajra Napier can be grown as intercrop in coconut garden (60% area) with integrated nutrient management including basal dose of farm yard manure (25t/ha) and 90:30:24NPK through chemical fertilizers (urea, rock phosphate and Muriate of potash). Subsequent top dressing can be done after every harvest at 45 days interval (6 times a year) through the recycling of organic inputs such as cow dung slurry (3750 L ha⁻¹), vermicompost (2000 kg ha⁻¹) along with Azospirillum (3.5 kg ha⁻¹) in two equal splits (immediately after harvest and 15 days later). This system of cultivation saves the usage of 50% inorganic fertilizers during the first year of planting and 100% in the succeeding years. The system can support 10 to 12 milch cows per hectare and generate a net return of Rs.4.5 lakh per year apart from additional benefit to coconut cultivation. ■