

Sustaining soil health in coconut gardens through grass –legume fodder combinations

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At present, Kerala has 13.42 lakh head of cattle (livestock census 2019) and Kerala produces only 60% of the roughages required for cattle in Kerala. The daily requirement of green fodder for the cattle is 8-10kg per 100kg weight (Rajesh Singh, 2019). Because of very limited land holdings, there is scarcity of fodder and subsequently the productivity of livestock will be limited. It is therefore necessary to make best utilization of available land for the maximum production of fodder crops. Intercropping fodder grass in coconut based mixed farming systems is an inevitable component to sustain livelihood and ensuring the feed availability to the cattle in an economically viable manner. Soil fertility is equally important as that of sustaining the farm productivity.

Continuous cultivation of fodder grass resulted in the depletion of soil nutrients such as potassium, which is the critical nutrient for coconut production. Both fodder grass and coconut are monocotyledonous crops. The fibrous root system of these crops explore nutrients from surface layers. This results in the competition for the exploration of nutrients from the soil from the limited soil volume. In such a situation, short duration crops will gain advantage over the perennial crops such as coconut. Though the fodder crops are planted outside the 2m radius of coconut basin, many times root spread of the fodder grass within the coconut basins occurs frequently. Here comes the importance of the inclusion of leguminous fodder crops such as cowpea and stylosanthes hamata as intercropped along with the grass fodder crops in coconut gardens. The border rows of leguminous fodder hinder the proliferation of the grass fodder roots in the basin and also supply nutrients through the residue addition.

Investigations conducted at ICAR-Central Plantation Crops Research Institute, Regional Station Kayamkulam during 2013-2016 have shown that fodder cowpea and



stylosanthes in the border rows of hybrid bajra napier grass in coconut garden of an average age of 25 years could enhance the soil fertility status. The depletion of available potassium in the soil can be reduced to a certain extent if the leguminous fodder crops are intermixed in the grass fodder plots. This in turn will decrease the competition for these available nutrients in the coconut gardens. Leguminous fodder crops have the potential to fix atmospheric nitrogen in its root nodules and thereby can enrich the soil fertility. The organic carbon content in the soil was found to be enhanced in the combination as compared to the sole crop of hybrid bajra napier grass. After three year study the organic carbon content was 0.642% from an average of 0.56%.

Varieties

Hybrid Bajra Napier Var. Suguna, fodder cowpea Var. EC4216, and stylosanthes hamata were found to be suitable to grow as intercrop in the border rows of hybrid bajra napier grass fodder legume combination for enhancing the soil health and crop productivity.



Planting

Hybrid Bajra Napier grass var. Suguna was planted at a spacing of 60cm X 60cm. In the border rows, stylosanthes hamata or cowpea can be planted.

Manuring and fertilizer application

In the case of Hybrid Bajra Napier grass, the recommended dose of fertiliser was 200:50:50 kg ha⁻¹ NPK (KAU, 2016). Entire P and K were applied as basal. Nitrogen @ 200kg/ha was given in three split doses. Field should be provided with adequate drainage especially during the rainy season. Depending on the rainfall and weather conditions irrigations can be given to avoid moisture stress. In the case of cowpea, the NPK as basal dose was applied @ 40:30:30kg NPK per ha. Stylosanthes hamata was given NPK@ 20:80:30kg/ha.

Harvest

The first harvest of fodder grass can be done 60days after the planting of slips. The harvest of fodder cowpea and stylosanthes can be taken at 30 to 45 days interval. The yield from the hybrid Bajra Napier grass

was 132t/ha/year. Intercropping cowpea with hybrid bajra napier grass recorded yield 5.96t/ha whereas stylosanthes hamata recorded the yield of 15.75t/ha. The leguminous fodder will supply proteins and improve the nutritional quality of feed for better animal productivity.

The combination of hybrid Bajra napier grass with leguminous fodder crops such as stylosanthes hamata and cowpea in coconut based mixed farming system is advantageous in terms of maintaining the soil fertility, organic matter status, content of potassium, calcium and magnesium. Due to the management of soil fertility, and favourable microclimate overall improvement in the yield of coconut was also observed. Adequate care should be taken to provide the recommended dose of nutrients to coconut as well as inter crops. Always it is advisable to adopt a crop combination of legumes and grass fodders in coconut garden so as to enrich the cattle feed and enhance the soil health and system sustainability.

Retirement



Smt. Lakshmi Devi M. P. Administrative Officer, retired from the services of Coconut Development Board on 31st December 2022 after completing 34 years of service.



Shri George Peter, Senior Field Officer, retired from the services of Coconut Development Board on 31st March 2023 after completing 33 years of service.