Interspaces of coconut being left fallow

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GARDEN LAND MANAGEMENT

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THE garden land of the humid tropics responds to intensive management. It comprises the deep sands of the coastal tract, fairly level deep red loam, the medium deep to shallow laterite soil of the slopes and shallow lateritic gravelly soil with rocky patches of the hill tops. The diverse physico-chemical properties of these soils necessitate adoption of location-specific agro-techniques to achieve the high production potential.

Existing Condition

A wide variety of perennial and annual crops is found growing haphazardly, resulting in the low gross as well as individual crop production. Compatibility of the crops for their canopy development and rooting pattern is not taken note of. Light is a major factor, limiting gowth and yield. Continued cropping for decades with little effort to improve or maintain the soil productivity has resulted in the low nutrient status of the soil and the keen competition for nutrients among the crops. The high intensity rainfall during the monsoons leaches and further depletes the soil of nutrients. Because of the slopy terrain, the richer surface soil gets eroded during heavy rains, and the common practice of planting catch crops on ridges and furrows along the slopes facilitates this.

Of the mean annual rainfall of 3,000 to 4,000 mm, nearly 80 per cent is received during June to September. In many places, a dry spell of five to six months is experienced. Consequently, growth and production of the perennial crops receive serious setback, especially in the light-textured soils.

To add to these, a large number of gardens and homesteads are small in size giving limited return. This results in partial to total neglect of the garden land.

Management of Soil

In the littoral sands, the main objective is to improve the productivity by enhancing the nutrient and water-holding capacity. Addition of slow decomposing organic matter is beneficial. Where dry husk of coconut is available and is cheap, this can be buried deep. Two alternating layers of coconut husk (300 nos.) and red earth (0.3 m^3) buried in the planting pits result in the fast and vigorous growth of the newly planted coconut seedlings. The beneficial effects of husk burial last for 8 to 10 years. Raising cover cum green manure crops like *Calapogonium, Pueraria,* etc., is also advantageous. Basal application of cattle manure with P and K ensures good establishment and growth of these cover crops in the first year itself. In subsequent years, it regenerates.

Terracing or contour bunding are essential on the slopes. These are expensive and add to the initial investment. Alternatively, platforms of 2–5 m^2 can be prepared along the contour and coconut, pepper, ashewnut, etc., planted on these. In a phased programme, these platforms can be connected and formed into terraces. Cover cum green manure crops may also be raised in the interspaces to check the flow velocity of run-off and soil erosion. As water is scarce and watering a difficult task on the slopes, to conserve moisture to the extent possible, large-sized planting pits of 1.5 m^3 may be dug and filled with coconut husk and top soil to the final planting depth of 60 cm.

In June, July and August, the flow of a large volume of water has to be carefully regulated to prevent the loss of the fertile top soil. A network of open drains has to be dug in heavier soils, avoiding steep falls and turbulent flow by allowing perennial grass to establish in the beds and sides of these waterways. Putting up strong bunds at suitable vertical intervals is necessary even in mild slopes and lighter soils. In plantations where intercropping

is not practised the weeds and grasses that come up with the rains may not be disturbed till the end of August or early September as these provide protective cover to the bare soil and check the velocity of surface flow.

Summer irrigation considerably enhances production. The water sources for lift irrigation are filter points, open or bore wells and streams that dry up in late summer. Surface conveyance of water is wasteful due to the terrain and the porosity of the soil. To obtain uniform distribution of water over the entire field, either sprinklers or perfosprays have to be installed. Where basin irrigation is envisaged a rubber hose can be utilized for distribution. Although such an irrigation system involves high initial investment, it is remunerative and is paid back in 3–4 years through increased production of the principal crops. In addition, this facilitates growing inter-crops and mixed crops round the year.

In light-textured soils like coastal sandy, loamy sand and sandy loam, even highly saline water/sea water can be used for summer irrigation without any harmful effect either on the soil or on crops like coconut. However, in the laterite and loamy soils, saline water should be used only with caution.

The desirable space for proper growth and productivity required by the principal crops, namely, coconut, arecanut, pepper and cashew are 50, 7.3, 9.0 and 50 m^2, respectively. The unproductive and uneconomic trees have to be culled to bring down the population to the desirable level. The crowns of trees like jack, mango, etc., which abound in the homestead gardens may be pruned and their canopy reduced to allow sufficient sunlight to fall on the principal crops. While new plantings are taken up the recommended inter- and intra-row spacings may be adhered to. This will also enable better utilization of the interspaces. To enable all the roots produced to be functional, planting has to be done at the recommended depth of 60 cm for coconut and 90 cm for arecanut.

A crop combination of coconut and turmeric

Care during the early years of plantation crops is also very important. Adverse effect on the normal physiological functioning and growth caused by deficiency or damage in the early stages cannot be fully corrected later. Hence even during the pre-bearing period, these crops have to be properly managed so that they grow fast and come to bearing early. Plant protection measures are equally important. Better utilization of applied nutrients can be obtained through split application of the annual dose and placement of fertilizers. One-third the annual dose of fertilizers to the principal crops may be applied in April-May after the receipt of summer showers. The fertilizers are spread over the entire area round the base of the palm within a radius of 2 m in the case of coconut and cashew and 1 m in the case of arecanut and pepper, and forked in. In August or early September, basins are dug round the palms about 25 to 30 cm deep and 1.8 m radius for coconut, and 1 m for arecanut and the balance two-third the annual dose of fertilizers spread over the entire basin. Green leaves or compost may also be applied in the basins at 30 to 50 kg per palm. In places where green leaf or compost is expensive and not readily available the cleanings from the crowns of the palms and other organic wastes collected on the farm may be put in the basin and covered along with the fertilizers. Under-splits will be advantageous.

Management of Manpower

Since the garden land holdings are too small to support a family, the first concern is means of livelihood. However, the productive utilization of self-labour on idle days and leisure hours on one's own farm have to be planned and executed. The returns from the principal crops may be forthcoming, only after 5 to 6 years, but proper utilization of the available space by growing annuals like dry paddy, tapioca, sweet potato, yam, vegetables and banana shall supplement the family's dietary needs.

Utilising the interspaces—tapioca being grown as an intercrop