INTERCROPPING OF MEDICINAL PLANTS IN COCONUT GARDEN

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Intercropping of medicinal plants in coconut garden

Coconut in India is primarily a crop of small farmers and about 98% of the coconut holdings in the country less than 2.0 ha in extent. The income derived from such small holdings is insufficient to sustain even the small families. In addition, coconut as a monocrop does not provide employment throughout the year. Coconut based cropping/farming systems involving cultivation of compatible crops in the interspaces of coconut offer considerable scope for increasing production and productivity per unit area, time and inputs by more efficient utilization of resources like sunlight, soil, water and labour. A spacing of 7.5mx7.5m recommended for the square system does not utilize fully the available resources such as land space, aerial space, water and nutrients. Active root zones of coconut is confined to 25 percent of the available land area and the remaining area could be profitably exploited for raising subsidiary crops. In adult plantation of more than 25 years old, about 45 to 50% of sunlight is wasted without intercepted by coconut. Thus growing compatible crops in coconut garden is recommended for better utilization of natural resources and for higher income.

Intercropping/mixed cropping with medicinal plants

In recent days, due to increased health consciousness of the people in general and harmful effects of the synthetic drugs, there is enhanced demand for the products of medicinal plants. Medicinal plants constitute a large segment of the flora, which provides raw materials for use by the pharmaceutical, cosmetic, fragrance and flavour industries. The increasing demand of medicinal plant based products has created acute shortage of raw materials and thus the major difficulty faced by the industries and entrepreneurs is in obtaining sufficient quantities of raw materials of desired quality for the internal consumption as well as for export. To address this situation, measures are needed to promote the cultivation and domestication of medicinal plants.

The studies conducted at Central Plantation Crops Research Institute, Kasaragod have indicated successful establishment and cultivation of following medicinal plants in adult coconut garden (Table 1):

Important medicinal uses:

East Indian galanagal (Kacholam): It has the properties such as stimulant, diuretic, carminative and flavouring agent. Oil finds use in perfumery and curry flavourings. Rhizomes are rich in oleoresin.

Arrowroot: The starch is valued as a food for infants, invalids and convalescents. Used in preparations of biscuits, cakes and jellies.

Orila: Roots are used in ayurvedic preparations which have thermogenic, constipating, diuretic, cardiotonic, nerve toning, anti-inflammatory properties, pacifies vitiated ‘tridoshas', edema and cardiomyopathy. Plant has detoxifying property.

Moovila: Moovila means three leaves. The small vine got its name from the fact that its each leaf is clearly divided into three, giving the impression that the leaves are a main leaf and two sub-leaves and commonly found in forests of Kerala. Its therapeutic uses revolve around the properties like alternative, anti-helminthic, diuretic, expectorant, nerve, stomachic and tonic. It is used in the treatment for asthma and nervous dysfunction. It is also used in the treatment of insect bites and used against inflammations, vomiting, etc.

Chittadlodakam: The plant is astringent, refrigerant, expectorant and diuretic. The leaves are good for irritable cough and for bleeding in diarrhoea. Flowers are used in ophthalmia. In Ayurveda, the leaves, seeds and fruits are used for treatment of cough, asthma.

Nigirianthus: Roots are useful in rheumatism, lumbar, limping, chest congestion, fever, leucoderma, skin diseases, inflammation, cough, bronchitis, debility, whooping cough etc.

Nagadanthi: Roots, seeds, leaves and seed oil are used to treat jaundice, constipation, piles, anemia, convulsions. The roots are purgative, antihelminthic (expel parasitic worms and helminths) and carminative. Used in abdominal pain, piles, scabies and skin disorders. Root paste is applied to painful swellings and piles. The leaves relieve asthma and seeds are used to cure snakebites.

Thippa li: Roots are used for the treatment of jaundice, constipation, piles, anemia, convulsions. The roots are purgative, anti- helminthic, diuretic, expectorant, nerve, stomachic and tonic. It is used in the treatment for asthma and nervous dysfunction. It is also used in the treatment of insect bites and used against inflammations, vomiting, etc.

Dried spike is less aromatic and more acrid, widely used in Siddha, Ayurveda and Unani particularly for diseases of the respiratory tract and the oil has antibacterial properties. Roots are used for bronchitis, stomachache and diseases of spleen and tumors.
Vetiver: Vetiver oil is extracted from roots of vetiver which is having great demand in perfume industry, essence, soap and food flavour industry. Oil emits a sweet and pleasant odour, used particularly in heavy antial fragrances, in soaps, lotions, deodorants and other cosmetics. Roots are also used in manufacturing ayurvedic medicines and as water purifier.

Aloe: This medicinal herb is used in Ayurveda, Siddha, and Homoeopathy. Many localized companies are preparing its products in buy back system or through any of the ayurvedic medicine manufacturers. Care should be taken to provide recommended organic manure for each crop and for coconut also.

For growing medicinal plants, land should be ploughed during summer months. Before planting, apply available organic manure like farm yard manure, vermicompost, compost or composted crop pith etc. and planting can be taken up during June-July months by adopting recommended packages. Earthing up should be carried out 30 days after planting by removing weeds, which will also enhance root growth and essential constituents content. Depending upon the economic parts used and duration, crops can be harvested and marketed. In vetiver, roots should be harvested, when they are somewhat thicker, which will yield better quality oil. Thippali starts flowering 3 months after planting and fruit will be ready for harvest 2 months later and it needs to be replanted once in 3 years. In aloe, the leaves are plucked and marketed or processed for juice making. Depending upon the market value of different medicinal plants, the net income varies from Rs. 30,000/- to Rs. 1,50,000/- per ha of coconut garden. Medicinal plants like vetiver, nagadanti, nligirianthus provided higher benefit cost ratio (4:1 to 5:1).

Table 1: Details of package of practices for medicinal plants

<table>
<thead>
<tr>
<th>Medicinal plant</th>
<th>Planting material</th>
<th>Duration</th>
<th>Spacing</th>
<th>Economic part</th>
<th>Organic manure</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Indian galangal - (Kacholam) (Kaempferia galanga L.)</td>
<td>Rhizome</td>
<td>8 months</td>
<td>20x15 cm flat bed</td>
<td>Rhizome</td>
<td>Vermicompost: 10 kg ha (At the time of planting)</td>
</tr>
<tr>
<td>Arrowroot - (Maranta arundinacea L.)</td>
<td>Rhizome</td>
<td>10-11 months</td>
<td>30x30 cm flat bed</td>
<td>Rhizome</td>
<td>Vermicompost: 15 kg ha (At the time of planting)</td>
</tr>
<tr>
<td>Ohta - (Dexmodium gangricum DC)</td>
<td>Seed</td>
<td>8 months</td>
<td>30x30 cm flat bed</td>
<td>Roots</td>
<td>Vermicompost: 10 kg ha (At the time of sowing)</td>
</tr>
<tr>
<td>Monika - (Pseudarthria viucola L.)</td>
<td>Seed</td>
<td>8 months</td>
<td>30x30 cm flat bed</td>
<td>Roots</td>
<td>Vermicompost: 10 kg ha (At the time of sowing)</td>
</tr>
<tr>
<td>Chitalakudakam - (Dalatria beddomei C.B.Clarke)</td>
<td>Cutting</td>
<td>1½ to 2 years</td>
<td>60x60 cm flat bed or ridge and furrow</td>
<td>Whole plant</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
<tr>
<td>Nigrastrum (Korinumkuri) - (Nigrastrum ciliatum (Nees) Brumsk.)</td>
<td>Cutting</td>
<td>1½ to 2 years</td>
<td>60x60 cm flat bed or ridge and furrow</td>
<td>Whole plant</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
<tr>
<td>Nagadanti - (Balphopium montanum) (Wild ) (Muk . Arg.)</td>
<td>Cutting</td>
<td>1½ to 2 years</td>
<td>60x60 cm flat bed or ridge and furrow</td>
<td>Roots</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
<tr>
<td>Indian long pepper (Trppelin) - (Piper longum L.)</td>
<td>Rooted cuttings</td>
<td>18 months</td>
<td>60x60 cm flat bed or ridge and furrow</td>
<td>Dried spikes, Roots</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
<tr>
<td>Khus grass (Vetiver) - (Vetiveria zizanioides LUNN. NASH)</td>
<td>Rooted slips</td>
<td></td>
<td>60x60 cm flat bed or ridge and furrow</td>
<td>Roots</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
<tr>
<td>Aloe (Aloe vera or barbadosse L. Bum.f.)</td>
<td>Suckers</td>
<td></td>
<td></td>
<td>Leaf</td>
<td>Vermicompost: 15 kg ha (two splits)</td>
</tr>
</tbody>
</table>

At CPCRI the above crops were grown in coconut garden only with organic manures and details of packages of practices adopted with their economic part used are given in Table 1.

Growing any of the medicinal plants in coconut garden depends upon the marketing aspects of the economic produce and local demand for the crop. For growing any of the medicinal plants, care should be taken to ensure market for the produce through buy back system or through any of the ayurvedic medicines manufacturers. Care should be taken to provide recommended organic manure for each crop and for coconut also. For growing medicinal plants, land should be ploughed during summer months. Before planting, apply available organic manure like farm yard manure, vermicompost, compost or composted crop pith etc. and planting can be taken up during June-July months by adopting recommended packages. Earthing up should be carried out 30 days after planting by removing weeds, which will also enhance root growth and essential constituents content. Depending upon the economic parts used and duration, crops can be harvested and marketed. In vetiver, roots should be harvested, when they are somewhat thicker, which will yield better quality oil. Thippali starts flowering 3 months after planting and fruit will be ready for harvest 2 months later and it needs to be replanted once in 3 years. In aloe, the leaves are plucked and processed for juice making. Depending upon the market value of different medicinal plants, the net income varies from Rs. 30,000/- to Rs. 1,50,000/- per ha of coconut garden. Medicinal plants like vetiver, nagadanti, nligirianthus provided higher benefit cost ratio (4:1 to 5:1).

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