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Scope of Patchouli cultivation in Tripura

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Patchouli is an aromatic herbaceous perennial plant, belongs to family Labiatae, yielding patchouli oil. Our country is importing annually patchouli oil worth rupees 60 lakhs to meet the internal demand. Indonesia is the largest producer of this oil in the world, accounting for 90 per cent of the world production. Its commercial cultivation is restricted to some pockets of Kerela and Tamil Nadu. Recently, Directorate of Horticultural, Tripura has taken up initiative to popularize the cultivation of this plant. There is a common interest among the farmers to take up the cultivation of patchouli, and moreover, it is performing very well under Tripura conditions. Hence, there is a urgent need to create awareness among the farmers about its cultivation.

Patchouli oil is used as a 'base' material in perfumery industry as it has strong fixative properties. It is also used as a flavour ingredient in many food products. It also possesses many medicinal properties.

There are three main species in this genus. *Pogestemon cablin* (Benth) Syn. *P. patchouli* has more commercial value since the oil content of the leaves is high compared to the other species, It varies from 2-6 per cent, but in the other species *viz.*, *P.heyneanus* and *P. hortensis*, it varies from 0.05 to 2 per cent only.

P. patchouli **plant in the field**

P. patchouli grows to a height of about 1 m and never flowers in Indonesia. It has hairless stem and twigs are quadrangular and have opposite leaves. The leaves are of a pale green colour, heart-shaped, slightly lobed and with downy hairs (more abundant of the lower surface than on the upper) and obtuse loves and apex. The leaves have glands which secrete the real oil.

Climate and soil : It thrives best in hot and humid conditions, therefore, can be grown in coastal areas of South India besides hill stations upto an elevation of 1500 m.

Patchouli might grow on a variety of soils, but virgin forest soils are the best. A deep loamy soil, rich in humus and nutrients, with good drainage but high water holding capacity without impervious layer in the topsoil is the most desirable soil type for optimum oil production.

Land preparation : The field must be thoroughly prepared to remove all obstacles, and this work must be done before the beginning of the rainy season. In the hill stations of South India, due to the sloppy terrain nature of the land, complete cleaning of the land is not recommended because it will encourage soil erosion, Therefore, slash weeding and spot cleaning are done where planting has to be exactly done.

Propagation : The real patchouli plant (*Pogestemon cablin* Benth) never flowers and therefore it has to be propagated vegetatively *i.e.* by cuttings, normally 15-20 cm long. Un-rooted cuttings can also be planted straightaway in which case, 2 to 3 cuttings have to be planted per hill during rainy season. They will required initial artificial shading for establishment.

Cuttings from the middle part of a stem give better sprouting than from either end of the stem. Experiments conducted in Tamil Nadu showed that herbaceous cuttings of 20-25 cm length prepared from healthy top shoots with 4 to 5 pairs of leaves are the best material for propagation. August is the best month for preparation of such cuttings to have better rooting and survival in the field. Cuttings root better in sand medium.

The rooted cuttings about here weeks old many either be planted directly in the field or further raised in plastic bags and transplanted into the field later on. It will be sufficient to plant one cutting per hill.

Planting distance: The ideal planting distance is dependent on soil and climatic conditions. In Tripura, planting is done in rows at 30x60 to 90 cm. In Tamil Nadu, a closer spacing of 30x30 cm is found to be ideal. On low

land and damp clay soil, patchouli should b planted on ridges at 50x100 cm but on hilly land contour planning at 50x100 cm is advisable.

Intercropping: As patchouli requires hot and humid climate, it can be also grown as intercrop in plantation crop like rubber, coconut and coffee.

When intercropped in rubber or other plantation crops, it should be noted that oil content in leaves grown in shade tends to become less than in leaves grown in sites exposed to the sun. Experiments conducted at Horticultural Research Station, Tamil Nadu, also made clear that oil content gets reduced with shade.

Patchouli should normally be renewed after two to three years because of strong signification and too low leaf production.

Manuring: No systematic manure is generally applied, but it is evident that considerable increase in yield can be obtained with the aid of fertilizers in combination with suitable methods of cultivation, Experiments conducted in Tamil Nadu show that a fertilizer dose of N 60, P_2O_5 30 and K_2O 30 kg/ha to be optimum for getting higher herbage and oil yield. Foliar applications of urea solutions also promote growth and leaf production, besides increasing the oil content of the leaves.

Harvesting: All parts of the plant, *i.e.*, roots, stem, braches, stalks and leaves contain essential oil, but the oil content of the leaves is by far the highest. The oil is also contained mostly in the top three leaves (Youngest), therefore, it is recommended that the leaves be harvested when the plant has five pairs of leaves, and only the leaves are distilled as the low oil content in the stem and stalks renders them unsuitable for distillation. Therefore, only the tops of the plants should be cut, using scissors or sharp knives. If the entire plant is cut, re-growth would take too long and the interval between the harvests would also be prolonged. The length of the cut tops varies from 25-45 cm, depending on the height of the bush. Stalks of 25 cm long and 1/3 cm thick with all leaves attached, are considered good distillation material.

The subsequent harvests occur at three to five month intervals; the leaves may be harvested for two to three years and there after the plant must be replanted. To permit harvesting cycles throughout the year, the planting should be done in several stages. For this purpose rooted cuttings raised in plastic bags are suitable planting material, as planting can be spread over a long period.

After harvesting, the leaves and stalks are usually dried in the sun. The leaves are spread in thin layers on concrete floors or bamboo racks. Proper drying is of great importance for the quality of both leaves and oil. During drying the leaves are regularly turned over by hand or by means of a stick to promote even and thorough drying and prevent fermentation, Depending on sunshine and the relative humidity of the air, drying of patchouli leaves requires about three days. Therefore, during the drying process it s most important to avoid fermentation, which readily takes place if the leaves are not properly spread and turned over frequently.

Distillation: Processed leaves alone should be used for distillation. It is advisable to interchange high and low steam pressure, thus giving full range to the forces and hydro-diffusion, which are important in the distillation of dried plant material. Oil recovery generally ranges from 3 to 3.5 per cent. The major constituent of oil is *patchouli* which varies from 30 to 40 per cent in patchouli oils.

Plant protection : Patchouli is often attacked by *Pachyzancla stultalis*, a leaf-roller and leaf-eating grasshoppers and leaf-eating crickets (Gryllidae) also have been noticed, the latter especially with young plants. In general, these pests can be easily controlled by spraying with 0.5 per cent dieldrin 50 per cent WP.

A more serious problem is nematodes, especially *Heterodera* sp, *Meloidogyne* sp., *Helicotylenchus* sp., *Tylenchorhynchus* sp., *Tylenchus* sp. The leaves turn yellow and the plant starts wilting; young plants may be killed by the attack.

Control measures for nematode consists of following proper crop rotation especially with a non host green manure crop like *Mucana puricata*, growing along with banana, grapes and other crops which normally receive nematicide application. Application of aldicarb 0.5 kg a.i and carbofuran at 0.5 kg a.i/ha are relatively best to reduce the population of root knot nematode to half. Application neem cake (1.0 t/ha) also is effective in controlling the population of nematode.

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