

Plumbago (Chitrak)

THE LEOPARD AMONG MEDICINAL PLANTS



Plumbago auriculata (Blue Chitrak)



Plumbago zeylanica (White Chitrak)



Plumbago indica (Red Chitrak)



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INTRODUCTION

Plumbago (Family: Plumbaginaceae), known in trade as Chitrak or Chitramool, is an important medicinal plant in the Indian Systems of Medicine. In an ancient ayurvedic literature, it is mentioned that similar to the leopard which has powers to chase down and destroy its prey, Plumbago is a highly potent plant that tears off unwanted growth. Plumbago is also revered by Acharya Charaka for its ability to improve appetite and digestion, cure abdominal pain and piles, and pacify thridosha (vata, pitta and kapha). Several tribal communities and traditional healers have been using this plant to ease pains, sores, influenzas, and manage several diseases of skin, nervous systems, digestive systems and urogenital systems. Pharmacological research showed that Plumbago intrinsically possesses a vast array of secondary metabolites. Among them, the most important chemical constituent is Plumbagin, which is chiefly present in its roots and bestows the plant with incredible curative qualities.

In India, Plumbago is distributed in central India to Uttar Pradesh, Assam, Bihar, Rajasthan, West Bengal, Maharashtra to different south Indian states. Plumbago enjoys regional names like Cheeth in Hindi, Chitramoola in Kannada, Koduveli in Malayalam, Chittira or Koduveli in Tamil, and Chitramoolamu in Telugu.

In India, three species of Plumbago, namely, *Plumbago zeylanica* or Shwetha Chitrak (White Chitrak), *Plumbago indica* or Lal Chitrak (Red Chitrak), and *Plumbago auriculata* or Nila Chitrak (Blue Chitrak) are widely used due to their high therapeutic properties. Among these three species, *Plumbago zeylanica* or Shwetha Chitrak is mostly cultivated and used in north India. On the other hand, in south India cultivation of *Plumbago indica* or Lal Chitrak, the indigenous species is preferred, as it produces comparatively large size roots here.

It is estimated that about 1,0000 tons of dry roots of Plumbago is required annually for catering the needs of Indian Ayurvedic drug industries. However, due to short supply, this demand for Plumbago roots is not being met. Therefore, it is necessary to take measures to promote Plumbago cultivation and create awareness among people, particularly the farmers, about cultivation practices and economics of Plumbago. In this brochure, scientifically validated agro-techniques and economics of cultivation of Plumbago plants are provided.



AGRO-TECHNIQUES

Chitrak grows in a variety of soils, ranging from red laterite soil, with very little topsoil, to deep black soil. However, well drained deep sandy loam to clayey loam soil with high organic content are ideal for cultivating Chitrak. Chitrak needs full sun to partial shade with intermediate to warm temperatures.

PROPAGATION METHODS

Seeds or stem cuttings are the common planting materials for Chitrak. From the ripened fruits, seeds can be collected during January- February. Use of fresh seeds is ideal for seedlings production. Percentage of germination can decline drastically to about 40% after three months storage under ambient conditions.

Germination of fresh seeds is almost 100%, if both ends of the seeds are nibbled carefully without damaging the embryo, before sowing. Chitrak seeds can be sown in germination trays filled with finely textured and well drained germination media (equal amounts of sand, soil, and FYM).

Seeds can also be sown in nursery beds prepared using equal quantities of soil, sand, and farmyard manure. Cover the seeds lightly with the growth medium. Do not allow the seedling trays or nursery beds to dry out. The seeds take about 3–4 weeks to germinate. Allow the seedlings to grow about 10 to 15 cm in length. Pluck these seedlings from seedling tray or nursery beds and transplant them in polybags filled with equal amounts of sand, soil, and FYM. Manage seedlings in poly bags for a couple of weeks to obtain well grown seedlings for transplanting in the field.

Propagules of Chitrak can also be obtained through vegetative propagation. Stem cuttings of 10–15 cm length, having at least three nodes, can be obtained from mother plants in March–April to raise the stock. The stem cuttings of Chitrak should be obtained from base till the third node at the apex of the mother plant. From one mother plant about four stem cuttings can be obtained. If mist chamber facility is available, plant propagation can be done throughout the year. The collected stem cuttings should be treated with 500 ppm NAA, that is, Naphthalene acetic acid, to promote quick rooting. Prepare the raised nursery beds of size 10 m x 1 m under partial shade. The height of the beds should be 15 cm. Plant the hormone treated stem cuttings at a spacing of 5 cm x 15 cm, in such a way that out of three nodes, one node must be buried in the soil, as the roots would sprout from this node. Keep the nursery beds moist by irrigated regularly. The cuttings start producing root within one month of planting. These rooted cuttings should be managed in the nursery beds for another 30 to 40 days before transplanting them in main field.

About 80,000 seedlings or rooted stem cuttings are required for planting in one hectare. For field planting, the field preparation should be done during May–June by ploughing and levelling to obtain a uniform fine tilth. FYM (farmyard manure) at the rate of 10 tonnes/hectare may be applied 30 days before planting at the time of ploughing and land preparation. Since Chitrak is very sensitive to waterlogging, good drainage need to be ensured.



PLANTING AND MANAGEMENT IN THE FIELD

Nursery grown plants or rooted cutting shall be planted at a spacing of 50 cm x 25 cm in the field at the onset of monsoon. Weeding should be done one month, three months and five months after planting. The crops should be irrigated four to five times in a month, in November, January, March, April, and May. Fruits ripen during January- February. They can be collected for raising new seedlings.

HARVESTING

Plants can be harvested 12 months after planting. The field should be irrigated and deep ploughed with mould board plough to expose the roots, which should be collected immediately. While uprooting the plant by hand or cleaning the collected roots, oil should be applied to hands or hand gloves should be worn, as the contact to milky exudate of this plant can cause contact dermatitis. The collected roots must be washed in clean water, air dried, and cut into 5–7.5 cm pieces. In case the users of Chitrak need dried roots, the roots must be dried to 10%–13% moisture content and then packed in airtight polybags for storage and transportation.



ECONOMICS OF CULTIVATION



Cultivation of Chitrak is profitable to farmers. Fresh weight root yield of Chitrak is around 6,000 to 8,000 kg per hectare. Total cost of cultivation and management, harvesting and post-harvest processing of Chitrak is around Rs. 2,00,000/- per hectare. With the expected sale price of Rs. 90 per kg of fresh roots of Chitrak, the gross income from one hectare land will be around Rs. 5,40,000/- to 7,20,000/-. Thus, within around 18 months, by cultivating Chitrak, a net income of Rs. 3,40,000/- to 5,20,000/- per ha can be obtained.

NMPB-RCFC (SOUTHERN REGION)

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