HIMHALDI

A cultivar of *Curcuma aromatica*

IHBT

BIORESOURCE DEVELOPMENT UNIT

(Under the aegis of National Bioresource Development Board, DBT, New Delhi)

INSTITUTE OF HIMALAYAN BIORESOURCE TECHNOLOGY (CSIR)

PALAMPUR (HIMACHAL PRADESH)

An ISO 9001-2000 Lab.

The cultivar ***HIMHALDI*** of *Curcuma aromatica* is developed by Institute of Himalayan Bioresource Technology (CSIR) under the aegis of the National Bioresource Development Board, New Delhi. In India, this plant is distributed in the Himalaya at 1000-2500 m altitudes. *C. aromatica* locally known as *Ban Haldi* is found as a wild species throughout India, though cultivated in West Bengal and south India.

C. aromatica is some times used as substitute of turmeric but not as a condiment. Considering the demand potential and regenerative capacity in nature, cultivation of *HIMHALDI* as a characterized variety of *Curcuma aromatica* is a significant advancement at the country level, since it is the first cultivar.

Botanical name: *Curcuma aromatica* Salisb. (Family Zingiberaceae).

Common names: Jangali Haldi (Hindi), Aranyaharidra and Vanarishta (Sanskrit), and Wild turmeric.

Botanical description: Leaves 38-60 by 10-20 cm, oblong-elliptic or oblong-lanceolate, caudate-acuminate, green often variegated above, pubescent beneath, base deltoid; petioles as long as or longer than the blade. Flowering stem appearing with or before the leafing stem, as thick as the forefinger, sheathed. Flowers fragrant, shorter than the bracts, in spikes 15-30 cm long; flowering bracts 3.8-5.0 cm long, corolla-tube 2.5 cm long, the upper half funnel-shaped; lobes pale rose-coloured. Lip yellow. Rootstock large, of palmately branched, sessile annulate biennial rhizome. The rhizome is light yellow (internally orange red) in colour and possesses a camphoraceous odour.

Flowering and fruiting: May-June.

Flowering in *HIMHALDI*

Uses: *Curcuma aromatica* has vast ethnobotanical value, already known in India as tonic, carminative, antidote to snake bite, astringent and used for bruises, corns and sprains. Paste of rhizome with milk is used for blood dysentery and stomachache. Juice of *C. aromatica* is given for curing indigestion, rheumatism and dysentery. Plant parts are also used for healing wounds and fractured bones. It is also used to remove stillborn baby from womb. Khasi and Garo tribes of Meghalaya make a paste of its rhizome and take it with water to kill intestinal worms.

C. aromatica possesses wide range of activities like antifungal, antimicrobial, mosquito repellent, anti-inflammatory. The oil exhibits inhibitory effect on sarcoma 100 in mice and is used for treating cervix cancer at early stage.

Climate: *HIMHALDI* is suitable for cultivation in mid-hills under sub-humid and sub-temperate climatic conditions. It can be grown in locations situated around and above 1300 m altitude. The location may be sunny or partially under shade.

Soil: *HIMHALDI* prefers clayey loam soils rich in organic matter (humus) content with adequate moisture. The pH of the soil may be slightly acidic to neutral (6-7).

CULTURAL PRACTICES

Field preparation: The soil of the field should be well pulverized before planting. A basal dose of 15 t of well rotten farmyard manure (FYM) should be thoroughly mixed in the soil at the time of field preparation.

Planting: Crop of *HIMHALDI* can be raised by planting rhizomes. The proper time for planting *HIMHALDI* is December and January. Rhizomes of 5 cm x 3 cm dimension with 2-3 eyes (vegetative buds) are suitable for planting. Larger rhizomes should be cut to ideal size before planting. About 12 q rhizomes are required for planting 1 ha area.

Plant spacing: The planting should be done in lines to facilitate inter-cultural operations. The spacing should be 50 cm between two rows and 50 cm between plants.

Manuring: The crop requires about 22.5 t/ha of organic manure for optimum growth. In the year of planting, as 15 t/ha of FYM has been given as basal dose, remaining 7.5 t/ha of FYM should be placed about 12-15 cm deep along the rows when the plants have sprouted during May-June. In the second year, the full dose of FYM (22.5 t/ha) should be placed at 12-15 cm soil-depth at 15 cm distance along the rows at about 10 days after crop sprouting. The manure should be carefully mixed in the soil with care to prevent any damage to rhizomes.

Water management: Under recommended agro-climatic conditions, the crop does not require irrigation. However, in case of the field where soil is not moist at the time of planting, light watering of the field soon after planting is recommended. In locations receiving high rainfall, care should be taken to ensure sub-surface drainage, as the crop does not endure waterlogging.

Rhizomes of *HIMHALDI*

Inter-cultures: About 45 days after sprouting, a shallow hand hoeing should be done to remove the weeds from the crop field. If the weed infestation is recurrent, another weeding may be done at about 20-25 days after the first weeding, depending upon the level of weed infestation.

Harvesting: The crop should be harvested only after 2 years of growth in the field. Under mid-hill

conditions, the crop plants normally become dormant during November-December. The crop is harvested during dormancy period in winter. When the foliage (leaves and stalks) turns yellow, the crop is ready for harvest. At this stage, the dried foliage should be cut at ground level and rhizome should be allowed to remain under the soil for 20-25 days to attain full ripening. Finally, the digging of the rhizomes should be done manually.

Yield: Average yield of fresh rhizomes of *HIMHALDI* is 60 t/ha at 2 years after planting. After harvesting, the rhizomes should be stored in cool and dark place until processing.

Oil production: First order rhizomes of *HIMHALDI* contain 2.4 % essential oil on dry weight basis, while second order rhizomes contain 1.2 % oil. About 200 kg of hydro-distilled oil (on dry weight basis) can be produced from 1 ha of the crop. The oil extracted from its rhizome is a blue-black dark liquid with camphorous, woody, amber, and spicy characteristic odour. The oil is in demand by the pharmaceutical and allied industries. In *HIMHALDI*, camphor is the major compound followed by 1,8 cineole and isobornyl alcohol.

Intercrop of *HIMHALDI*

Shade requirement: *HIMHALDI* can also be grown under partial natural shade. Thus, it can be integrated with agro-forestry / social forestry.

Economics: Total cost of cultivation on 1 ha area for two years varies from Rs. 55,000 to 60,000. Approximate net income from 1 ha crop of *HIMHALDI* is Rs. 80,000 in 2 years.

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