

Package of Practice

Agar Cultivation



ADVANCING
NORTH EAST

An Initiative of North Eastern Council (NEC)

Implemented by North Eastern Development Finance Corporation Limited (NEDFi)

AGAR

SCOPE OF THE CROP: Agar wood has high demand throughout the world as a raw material for incense, perfume and medicinal purposes with Middle East and East Asia as the two main regions of consumption. Global agar wood prices can be ranging from US\$ 20-6000 per kilogram for the wood chips depending on its quality or US\$ 10,000 per kilogram for the wood itself. In addition, the value of agar wood essential oil is also as high as US\$ 30,000 per kilogram. Since nowadays healthy *Aquilaria* trees does not form agar wood, the scarcity of naturally occurring agar wood has prompted the development of artificial agar wood-inducing methods for mankind. To protect the endangered *Aquilaria* species, mass plantation of *Aquilaria* trees has become a sustainable way to obtain highly valuable agar wood.

VARIETIES OF THE CROP: Most of the species of *Aquilaria* when effected naturally or artificially turns into Agar wood. There are 21 species of *Aquilaria* described so far. In north-eastern India, two species of *Aquilaria* has been identified i.e Jati Sanchi and Bhola Sanchi. Jati Sanchi is preferred for commercial cultivation.

BACKGROUND OF THE CROP:

- **SCIENTIFIC NAME:** *Aquilaria agallocha*
- **FAMILY:** Thymelaeaceae
- **ORIGIN:** South East Asia
- **BOTANICAL DESCRIPTION:** It is a forest tree reaching a height of 40 m and 80 cm wide. Agar wood is a dark resinous fragrant wood for which it is used in perfumes, small carvings and incenses.
- **AGAR WOOD OIL:** Agar wood undergoes a series of steam distillation and produces different grades of oil of varying strengths costing according to the grade. Undiluted oil is safe to use on the skin, used as anti-cancer therapy and generates positive energy.

USES AND HEALTH BENEFITS:

- Agar wood is one of the most expensive non-timber wood products of the world.

- The bark of the plant is used as raw material for preparing a writing paper called 'Sanchi pat' for writing religious scripts.
- It has multidimensional uses in perfumes, cosmetics and medicinal sector.
- The trees from which Agar wood oil is obtained are cultivated and the resin is created by artificial infection and essential oil is extracted by water distillation.
- Ayurvedic and Chinese medicine have used agar wood as natural sedative, aphrodisiac, digestive aid and pain reliever.
- Agar wood is rich in anti-oxidants and anti-inflammatory agents.
- Agar wood oil reduces joint pain, treat acne, skin irritations, fights breast cancer, treats rheumatism and other body pain.
- When used in aromatherapy, agar wood oil helps to treat anxiety, stress, depression and other nervous disorders.

CHALLENGES:

- Agar wood initiate leafing during pre-monsoon period (March-April) and continued up to a warm monsoon period throughout the favourable season (July-August).
- Availability of seasonal water has a strong impact on fruiting.
- Agar wood generally grows well in hilly areas greater than 750 m above sea level.
- Agar wood plantation should be adapted in slopy land to prevent water stagnation.

CULTIVATION AND MANAGEMENT:

- **SOIL:** Agar wood grows in yellow, red podzolic, clay sandy soil. These trees should grow in soil having solum thickness more than 50 cm.
- **CLIMATE:** Agar wood generally grows in hilly areas greater than 750 m above sea level. The temperature ranges from 20-30 degree C at an average.

- **PROPAGATION:** The process of propagation takes place at the stage of seed maturation. Propagation could be done immediately after bursting as the seeds have short viability.
- **PLANTING:** Plantation can be done in sloppy land to reduce mortality. The seedlings are transplanted in the ground after attaining height of 60-90 cm.
- **MANURING:** Coco-peat is added to the soil to loosen the soil. Cow dung acts as an organic fertilizer and 20 grams of Furadon is added to resist the insects.
- **HARVESTING AND YIELD:** Harvesting of trees to produce oil is not recommended before 10 years. At the time of harvesting, the root portion will be dug out and the resin can be segregated from the Aquilaria tree.

The average yield from single tree is 4 kg approximately. After 10 years of planting, each tree yields approximately 30-40 kg of agar wood.

- **PESTS:** Agar wood plants suffer from leaf pests attack known as Heortia vitessoides Moore



AGARWOOD RESIN AND AGARWOOD PLANT

FARM ECONOMICS OF AGAR CULTIVATION IN ONE ACRE OF LAND AREA	
CAPITAL INVESTMENT	
PARAMETERS	APPROX AMOUNT IN Rs
INITIAL EXPENSES	
LAND HOLDING	OWN LAND

LAND DIGGING	20,000
FENCING	10,000
COST OF POWER TILLER	160,000
SOIL LEVELLING AND TILLERING INCLUDING DIESEL COST	15,000
STOREHOUSE CONSTRUCTION COST 100 SQ FT @ 200/-PER SQ FT	20,000
TOTAL	225,000
IRRIGATION AND IMPLEMENTS	
TUBEWELL/ SUBMERSIBLE PUMP COST	10,000
PUMP AND ELECTRICAL INSTALLATION	20,000
AGRICULTURAL EQUIPMENTS	4,000
DRYING PLATFORM (OIL EXTRACTION)- MAY INSTALL AT THE 10TH YEAR AND NOT SHOWING HERE	
TOTAL	34,000
TOTAL CAPITAL INVESTMENT	259,000
RECURRING COST	
ESSENTIAL CREDENTIALS	
COST OF LABOUR (1. LAND PREPARATION COST-12 MANDAYS@ 350/-PER MANDAYS, 2. PLANTING-12 MANDAYS @350/-PER MANDAYS, 3.FENCING-12 MANDAYS @ 350/-PER MANDAYS, 4. HARVESTING AFTER 10 YEAR-12MANDAYS @ 350/-PER MANDAYS PER HARVESTING, 5. OIL EXTRACTION-12 MANDAYS @ 350/-PER MAN DAYS (36 MANDAYS IN 1ST YR)	12,600
FERTILISER AND OTHER AGRO CHEMICALS LUMPSUM	15000
TOTAL	27,600
PLANTING AND MULCHING MATERIAL	
AGAR WOOD PLANTING MATERIAL (500 SEEDS / ACRE) (1,000 Rs PER KG OF SEEDS)	500,000
MULCHING (USING BLACK POLYTHENE MULCH)	20,000
MISCELLANEOUS	10,000
TOTAL	530,000
TOTAL RECURRING COST	557,600
GRAND TOTAL (CAPITAL COST + RECURRING COST)	816,600
INCOME STATEMENT	
PARAMETERS	APPROX AMOUNT IN Rs
TOTAL AGAR WOOD PRODUCTION-10000 KG OF CHIPS PER ACRE ; SELLING PRICE:25000 Rs /KG	25,000,000

Model Project Profile

TOTAL INCOME	25,000,000
PROFIT AND LOSS STATEMENT	
PARAMETERS	APPROX AMOUNT IN Rs
CAPITAL INVESTMENT	259,000
RECURRING COST	557,600
TOTAL INVESTMENT UPTO 10 YEAR	816,600
TOTAL INCOME	25,000,000
TOTAL PROFIT AFTER 10 YEAR	24,442,400