

AbhinayaS Agro Tech

AGAR WOOD

THE FUTURE MONEY SPINNING TREE

REGISTERED OFFICE:

AbhinayaS Agro Tech,
Nagaland

BRANCH OFFICE:

Abhinaya Traders,
Tamilnadu.



AGAR WOOD

ABHINAYAS AGRO TECH

- Plantation & Inoculation of Agarwood Trees for higher yield of resin formation

1. INTRODUCTION TO OUD/AGARWOOD:

Agarwood, aloeswood, eaglewood or gharuwood is a fragrant dark resinous wood used in incense, perfume, and small carvings. It is formed in the heartwood of aquilaria trees when they become infected with a type of mold (Phialophora parasitica). Prior to infection, the heartwood is odourless, relatively light and pale coloured; however, as the infection progresses, the tree produces a dark aromatic resin, called aloes or agar as well as gaharu, jinko, oud, or oudh aguru in response to the attack, which results in a very dense, dark, resin-embedded heartwood.

Naturally, the agarwood trees are injured by an insect named "Zeuzera Conferta" or Borer Insect. After this injury the heartwood becomes infected with the mold **Phialophora parasitica** and the wood forms a dark resin which gives exotic scent when burnt slowly as incense. The whole trunk and the branches of the tree also gives an Oil popularly known as Dahn Al Oud in the Middle East. There are different grades of the oil depending on the geographical location of the tree, method of distillation and time of extraction.

AGAR WOOD

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- AGAR WOOD (THE FUTURE MONEY SPINNING TREE)

The aromatic qualities of agarwood are influenced by the species, geographic location, its branch, trunk and root origin, length of time since infection, and methods of harvesting and processing.

Agarwood is mainly sold in two varieties in the market presently, i.e. **Agarwood Chips** and **Agarwood Oil or Dahn al Oud**. But each of these categories have several sub categories depending upon the quality of the material. It has high demand in the Middle East & most of the European Countries with increasing demand in North & South American Countries.

The First-grade agarwood is one of the most expensive natural raw materials in the world, with prices for superior pure material as high as US\$100,000/kg.

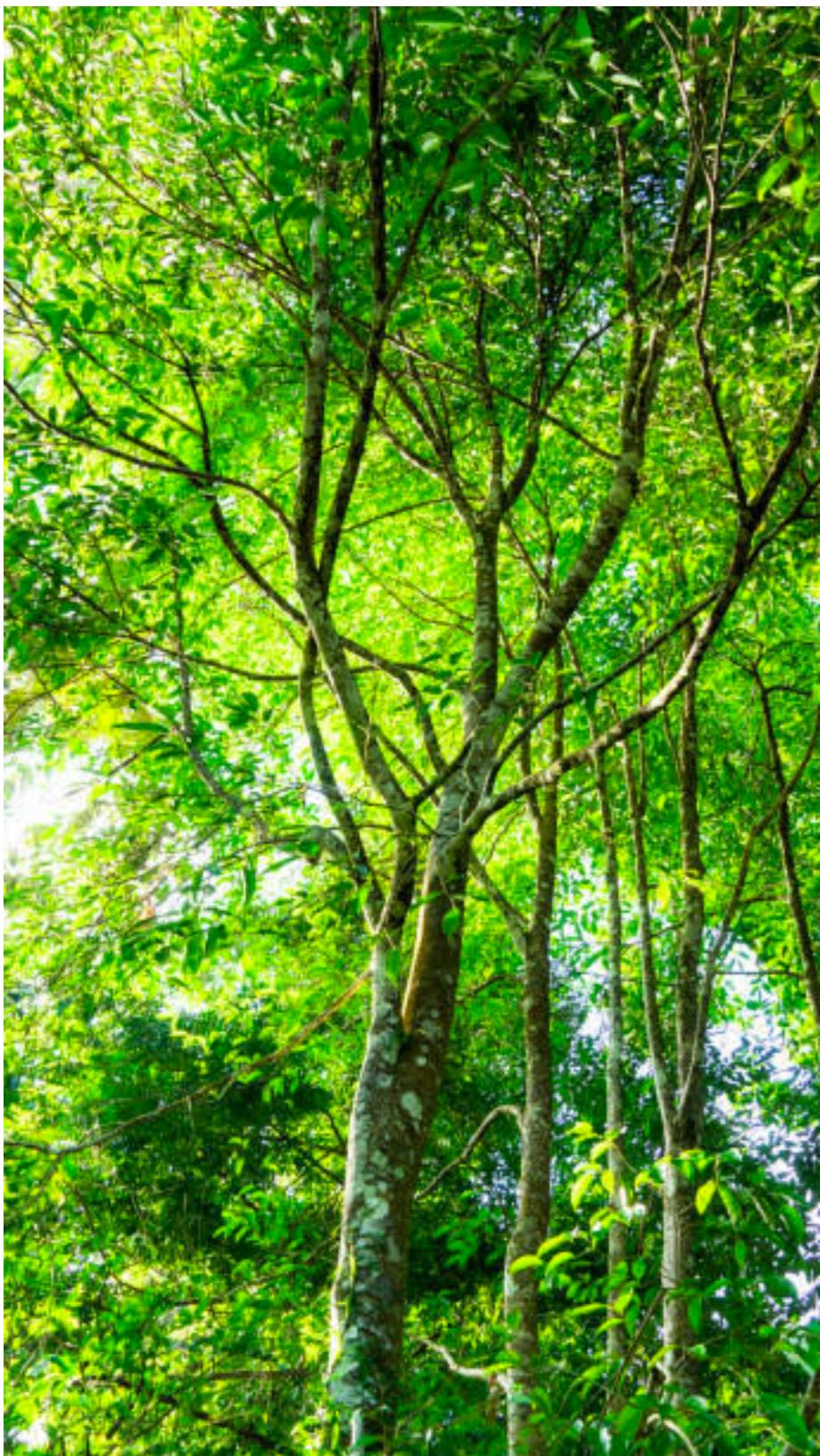
In the perfume state, the scent is mainly distinguished by a combination of "oriental-woody" and "very soft fruity-floral" notes. The incense smoke is also characterized by a "sweet- balsamic" note and "shades of vanilla and musk" and amber.

2. CHALLENGES IN AGAR WOOD PLANTATION

Though agarwood trees grow in abundance in India, Bhutan, Sri Lanka, Bangladesh, Thailand, Tibet, Myanmar, Malaysia, Indonesia, Cambodia, Philippines & Papua New Guinea, the natural Agarwood Resin is still extremely rare. The reason behind this is the complex method of resin formation in the trees. The climate conditions in some areas create favourable conditions for the Borer Insects to injure the trees where the fungal infection has to take place.

Whereas there are more than million trees in such & other areas where no natural formation of resin takes place resulting in barren and useless trees. As per research only 5-10% of the agarwood trees naturally form the resin wood while the rest of the trees remain useless thus eventually had to be cut down by the agar growers.





3. BREAKTHROUGH IN ARTIFICIAL INOCULATION OF AGARWOOD:

In the year 2021, our company, i.e., 'AbhinayaS Agro Tech' along with a company at Assam succeeded in developing the first ever herbal inoculant which is made purely from natural ingredients without any use of chemicals or synthetic materials. This inoculant recorded a 100% success rate in successful formation of resin in the trees which gives pure black agarwood resin with natural fragrance. The trees also increase the chance of formation of natural resin-wood in addition to the inoculated wood. Moreover, it does not harm the trees or the environment in any way.

Due to the result of this inoculant, our company received state recognition from the Government of Assam in 2019 and 2020.

Our company is the only entity which commits Buy Back Guarantee to its clients.

This is a major issue faced by a lot of Agarwood Growers. Many individuals and Organisations tried to develop different techniques to artificially grow resin inside the trees.



Following techniques were used for artificial resin formation and the resultant yield showed the following issues:

1. Bamboo Stick Injury: A Bamboo stick is inserted inside the tree trunk due to which a black resin type material form. But this technique has zero fragrance and the colour fades within a few days.
2. Iron Nail Injury: Iron nails are inserted in the tree trunk resulting in dark red resin formation. Lack of fragrance and colour.
3. 'Gaph' or Trunk Injury by Knife/cutter: same as above.
4. Chemical Inoculation: A chemical medicine is introduced in the tree trunk resulting in blackish resin formation, but the resultant agarwood gives a foul odour/smell and results in irritation of eyes due to the chemical used. The oil extracted also lacks the proper fragrance and may cause skin disease.

While all these techniques succeeded in forming a darkish resin inside the trees but the growers and traders could not sell their product in the National & International Market. The reason behind this is that, the consumers of agarwood over the world buy the products on the basis of the scent of the resin wood and the "Laal Guri" quality of the wood. ("Laal Guri" is the inner portion of an agarwood chip which doesn't contain any white wood or other dirt and develops a black outgrowth which gives out the scent of the wood.)

The above methods proved to be unsuccessful in giving the wood its natural scent and the wood's resin is light above the whitewood, which burns into ash too quickly. Moreover, the use of chemicals or Bamboo stick results in lack of scent and irritation of eyes. Thus, agarwood from such methods failed to grab the market disappointing the farmers/growers.



4. APPROACH & TECHNOLOGY:

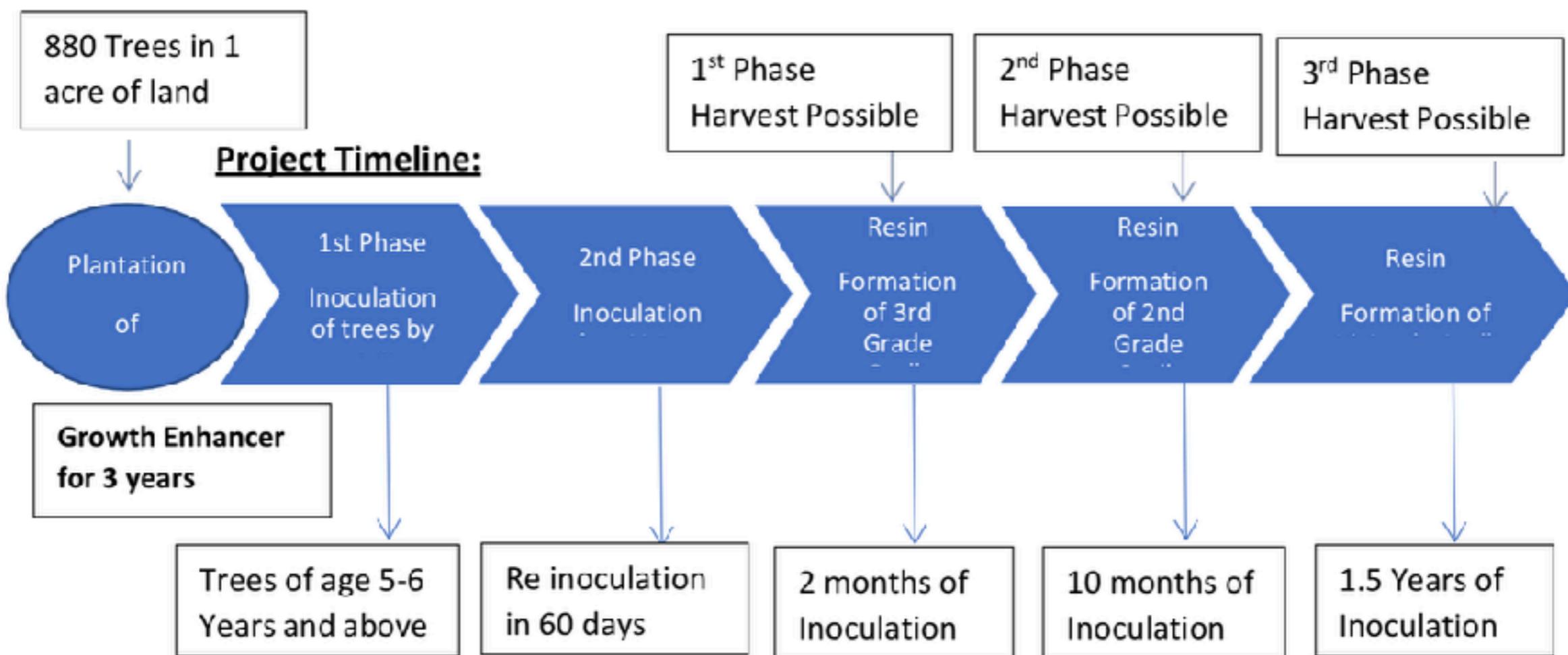
The Experts at **AbhinayaS Agro Tech** have developed 3 types of techniques for artificial inoculation of Agarwood. These techniques have been recognised and proven to be the best inoculation techniques till date and has a 100% success rate. The techniques are:

1. DTII (Direct Trunk Injection of Inoculum)
2. TII C(Trunk Injection of Inoculum through Cannula) &
3. PIBR (Pasting of Inoculum through Bark Removal)

5. PROJECT SUMMARY

The objective of this project is to artificially inoculate Agarwood trees with natural & herbal inoculum/medicines to develop best quality Agarwood/Oudh without affecting or harming the natural system of growth and the environment. The project is intended to produce

1. Quality Oudh through scientific process which have high demand in the Middle east and the European countries.
2. Generation of high and attractive income for the agar growers in India who were disappointed with the previous yield otherwise.
3. Highest Return on Investment for traders and growers with minimum amount of investment



Note: Refer to the price chart given below for prices of all the grades of inoculated agarwood.

Our methodologies follow the same routine like the natural formation of Agarwood. In all the three methods the primary step is to injure the tree trunk artificially to facilitate the fungus infection.

In **DTII**, the injury is done through drill machines with proper precision by our inoculation experts. The drill holes need to be in proper place and with proper measurements. After this process, the inoculum is injected in the tree trunk through the drill holes. This process is repeated in another 60 days and left for a few months. This method is one of the most commonly used methods by our clients and partners because of it requires low investment and results are amazingly good.

In **TIIC** method, after the drill injury, the inoculum is injected through a cannula for a longer period of time. This process requires more amount of inoculum but the quantity of Oud obtained is quite high. Therefore, this is the most popular method of artificial inoculation.

In **PIBR** method, drill holes are not required, rather, the tree is injured through deep cuts in the tree trunk, a little deeper than the bark of the tree and the inoculum is pasted in the injured areas.

The resin formation can be seen within 2 months or less. The more time the inoculum is kept in the tree, the more valuable quality of Oud is obtained.





6. PROCESSING OF HARVESTED AGARWOOD

After tree felling, the leaves and branches are removed and the trunk is cut into 2-3 feet logs. The logs are cut into small blocks of wood very carefully without harming the resinous portion of the wood. Then, the resinous & non resinous wood is separated with the help of indigenous manual hand tools known as "Batail" or "Botali" of different types and sizes. The resinous wood is further polished and graded as per market standards.

The Oil is extracted through Hydro distillation or steam distillation of the infected resinous wood residues and the wood dust that remains while polishing the wood. This is a meticulous process and needs 24*7 monitoring for the extraction of the best Agar Oil also known as "Dahn Al Oud"

7. BY PRODUCTS OF AGARWOOD:

Besides chips and oil, the residue dust after distillation and even the leaves are sold in different sectors of the market in the world. The **residue dust** is largely used in incense industry whereas the leaves are commonly distilled to extract agar leaf oil used for therapeutic purposes and cosmetics.

The agar leaves are also consumed in the form of **beverage similar to tea** and also combined with tea since it has immense medicinal benefits still unknown to many people in the world.

The outer non resinous part of the tree which is white in colour is also distilled in large scale to obtain a particular Oil known as "**Boya**" which has high demand in the European markets especially the **cosmetic industry**. Thus, not a single part of the agarwood tree goes in waste.





Estimated Budget of the Project:

Following is an estimated budget for 1 acre land

i.e., 880 Agarwood Trees. Cost of 850 Saplings

@ Rs. 35 per sapling (Transporting cost extra) = $Rs. 35 \times 880 = Rs. 30,800/-$ -planting of Saplings

- $Rs. 20 \times 880 = Rs. 17600/-$

Total = $Rs. 30800 + Rs. 17600 = Rs. 48400/-$ per acre

Growth Enhancer = Rs. 50000/- for 3 years (including labour charges)

Net Plantation Expense = Rs. 48400 + Rs. 50000 = Rs. 98400/- (for 5 years).

8. INOCULATION:

DTII (Injection) : A tree with 1-2 feet girth requires 2 litres of Inoculum for 880 trees (@Rs. 2000/- per litre)

2 litres x Rs. 2000 x 880 trees = Rs. 35,20,000/-

Labour charge for 880 trees: = Rs. 3,00,000/-

Labour Charge for harvesting & processing = Rs. 70,00,000/-

Plantation Expense - Rs. 98400/-

Therefore, an Overall estimated **Rs. 1,09,18,400 /-** approximately would be required for the overall project of 880 trees in case of DTII (Injection) technique.

Net Return on Investment = $Rs. 7,04,00,000 - Rs. 1,09,18,000/- = Rs. 5,94,82,000 /-$
(Rupees Five Crores Ninety Four Lakhs Eighty Two Thousand Only)



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9. RETURN ON INVESTMENT (ROI) ON DTII :

Yield of Resinous Oud = 1.5 - 3 Kgs per tree, i.e. 2 kgs x 880 trees = 1760 Kgs

24 months harvest = Rs. 40000 per kg x 1760 kg = Rs. 70400000/- (Selling Price)

Note: This amount is only a rough estimation. The original amount can vary as per the tree size and age which can only be estimated through a proper customised Quotation.

TIIC (Cannula) 1 Feet girth

A tree with 1 feet girth requires 3 litres of Inoculum

continuing for 45 days for 880 trees(@Rs. 2000/- per litre)

3 litres x Rs. 2000 x 880 trees = Rs. 52,80,000/- Labour charge for 880 trees: = Rs. 5,00,000/- Labour Charge for harvesting & processing = Rs. 1,50,00,000/- (1 Cr approx.)

Plantation Expense - Rs. 98400/-

Therefore, an Overall estimated **Rs. 2,08,78,400/-** approximately would be required for the overall project of 880 trees in case of DTII (Injection) technique.



10 RETURN ON INVESTMENT (ROI) ON TIIC

Yield of Resinous Oud = 3 - 12 Kgs per tree, i.e. 4 kgs x 880 trees = 3520 Kgs

36 months harvest = Rs. 80000 per kg x 3520 kg = Rs. 28,16,00,000/-
(Selling Price) Net Return on Investment = Rs. 28,16,00,000 - Rs. 2,08,78,400/- = **Rs. 26,07,21,600/-**

NOTE: THE BUDGET GIVEN ABOVE FOR THE OVERALL PROJECT IS ONLY AN ESTIMATION BASED ON THE CURRENT RATES. THE ACTUAL FIGURES/AMOUNTS COULD VARY TO AN EXTENT DUE TO VARIOUS FACTORS (RUPEES TWENTY SIX CRORES SEVEN LAKHS TWENTY ONE THOUSAND SIX HUNDRED ONLY)

As Per the market standards, the prices of Inoculated Agarwood vary depending on the duration of inoculation period.

- The 1st Phase harvest sells at Rs. 20,000 - 30,000 per kilogram
- The 2nd Phase harvest sells at Rs. 40,000 - 60,000 per kilogram
- The 3rd Phase harvest sells at Rs. 60,000 - Rs. 90,000 per kilogram



Buy Back Guarantee:

AbhinayaS Agro Tech is the only company in the world that gives a BUY BACK GUARANTEE of inoculated oud to its clients. This is a commitment from the company to its clients who partner with the company for inoculation, that they can sell their products after maturity of the inoculated trees and the Company commits to buy the same from them according to the market rates.

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