

Development of Aquilaria plantations and eaglewood production in southern China

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There are about 100,000 ha *Aquilaria* plantations in southern China. Dominant Species used for plantations is *Aquilaria sinensis* (Lour.) Spreng. Objective product of the plantations is eaglewood for medicine, perfume and eaglewood oil.

During seedling raising, it is very important to prevent root nematode invading. Two years old container-seedlings at the height about 1 m are suitable for plantation establishment. Early fertilizations are very useful for fast growth of young trees. when average DBH of trees is about 10-15 cm at the age of 5-10 years, it is possible for promoting eaglewood production.



seeds



nursery



Seedlings for planting



7 years old plantation

There is no eaglewood production without a treatments to the trees until natural injuring caused by insects, diseases or wind damage. Experiments were done to select efficient treatments to promote eaglewood production. Inoculation of fungi, dripping of chemicals and plant growth regulators to stem are helpful for eaglewood production. Cutting roots, section cutting on stem and drilling holes on stem are useful traditional methods for eaglewood production.



control



Root cutting



Drilling holes on stem



Section cutting on stem

Table 1: Agarwood oil production after traditional treatment

Treatment	Agarwood oil (%)		
	2 months	6 months	10 months
control	3.35±0.17 c	3.14±0.22 c	3.25±0.42 c
section cutting	5.7±0.17 bc	6.01±0.36 bc	6.38±0.77 ab
drilling hole	6.21±0.19 a	6.56±0.19 a	6.95±0.57 a
root cutting	6±0.24 ab	6.35±0.48ab	6.70±0.48 a

When trees were hurt or injured, stem-bark respiration was increased, then starch in stem wood was decreased, and finally formed volatile oil accumulated around injured sections. Agarwood formation was an inductive stimulus, resulting in defense response, and produce secondary metabolism during the dynamic process. Artificial wound, use of plant growth regulators and fungi inoculation were effective methods for promoting agarwood formation. The stem defense response and respiration had the certain index to predict agarwood formation.

Table 2: Agarwood oil production after fungus treatment

Fungus	DBH(cm)	agarwood oil (%)
CK	9.43±0.17 a	5
Lasiodiplodia theobromae	9.25±0.43 a	13.16
Epicoccum sorghi	9.34±0.15 a	9.04
Penicillium meleagrinum	9.33±0.33 a	11.38
Nectria sp	9.63±0.42 a	9.62
Phaeoacremonium rubrigenum	9.52±0.42 a	9.65
Trichoderma atroviride	9.33±0.18 a	12.21
Trichoderma koningiopsis	9.97±0.36 a	11.04
Penicillium italicum	9.62±0.65 a	11.7
Fusarium solani	9.93±0.68 a	14.03
Botryosphaeria rhodina	9.25±0.40 a	12.88

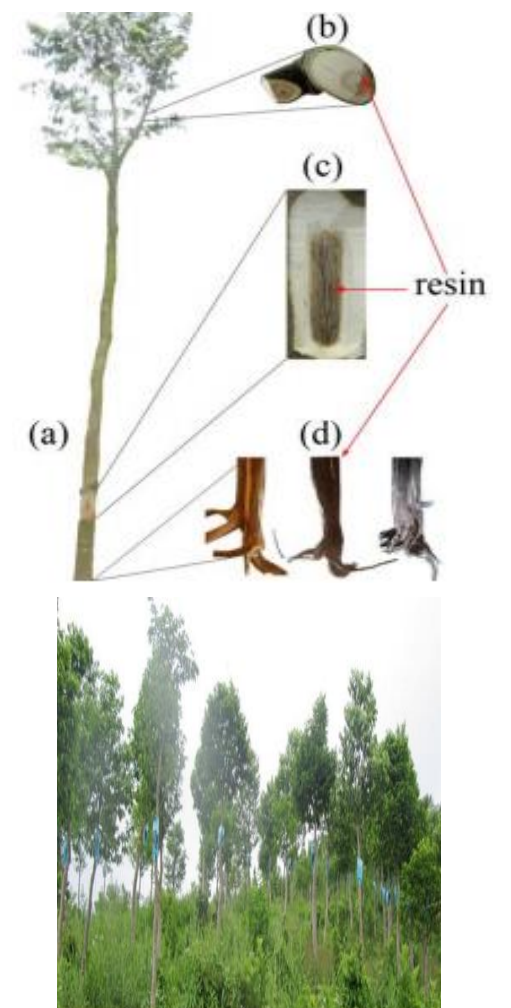


Table 3: Agarwood oil production after plant regulator treatment

Treatment	agarwood oil (%)		
	2 months	6 months	10 months
control	3.35±0.17 c	3.14±0.22 c	3.25±0.42 c
ME	8.48±1.02 a	8.79±1.04 a	9.12±1.16 a
6A	7.2±0.18 b	7.55±0.22 b	7.91±0.37 b
6E	6.57±0.31 b	6.92±0.35 b	7.29±0.5 b
MA	6.87±0.28 b	7.22±0.23 b	7.58±0.38 b



Application system

More Study is needed to find high efficient methods to produce agarwood with more than 20% old contents. It will helpful for protection of natural *Aquilaria* resource in Southeast Asia and China.