AQUILARIA UPDATE AUSTRALIA

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WESCORP AGARWOOD

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CA 1 prior to harvest

CA 1 being trimmed

CA I Harvested in October 2013

CA 1 was planted at AABabinda in May 2009. As soon as it was planted, it stopped raining until November the same year. The trees survived on 1 litre of hand watering per week. There was no growth until December. Due to 5 major floods in two years and two cyclones, this plantation is now reserved for experiments and trials.

With a base diameter of 11cm, CA 1 was induced with CAKit on 10th September 2012. We induced right up to the diameter of 5cm. On 28th February we gave CA 1 a boost treatment. It's base diameter was 12.3cm on this day.

Photo on left;
Dr Tony Page and Tim Coakley at CA 1

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CA 1 de-barking

CA 1 cleaned

CA 1 base

CA I Harvested in October 2013 (continued)

On 4th October 2013 CA 1 base diameter was 14.4cm and breast height was 10.1cm. Dr Tony Page assisted in the harvesting of this tree. The wet weight was 20kgs and once the bark was removed it came down to 17kgs. One kg was taken back to Perth for Danny to test. After drying in a shed on pallets, the wood reduced to a dry weight of 8.5kg which is a loss of nearly 50%.

CA 1 resin at 1 metre

For the inducement time period and small size of the tree, we were thrilled with the resin formation.

Flowering of Trees;

It has been a very poor flowering this year so far, but we expect it to improve now that we have had good rains. We expect it to be just 1 month later than last year.

CA 13 Inducement;

CA 13 was planted at AABoulders in March 2010. By October it had grown to recommended size for inducement. Dr Tony Page has captured this trees genetics. At 3 years and 7 months old, on 26th October 2013 it was induced with CAKit. The base diameter is 18.2cm and breast height was 15cm. We put 43 holes and pipes in up to 3.7 metres from the ground and to 8cm in diameter.

Photos of CA 13

This tree will give us a true indication of what we should expect from the plantations in the future.

Reproductive biology and physiological characteristics of *Aquilaria* (agarwood) plantations in north Queensland, Australia

By Arlene Lopez

Wescorp's agarwood plantations in North Queensland are based on wild-collected seed from a range of different provenances. Generally these plantations have demonstrated good productivity with substantial variation among individual trees. This diversity allows Wescorp to select for the most productive individuals as the basis of the next generation of plantings. This new PhD study will include studies to develop a better understanding of this species reproductive biology and physiological process linked with growth performance. This information is very important to support selection of the most productive trees together with their hybridisation to invigorate future plantations.

The study will cover the following areas of interest:

- Identify and describe flowering and fruiting patterns for agarwood in north Queensland.
- Describe the mating system of *Aquilaria* to support efforts at cross breeding among highly productive individuals in the planted estate.
- Determine physiological processes that would contribute to high performance in *Aquilaria* selections.

First International Scientific Symposium on Agarwood at University of Putra Malaysia

Summary by Danny Hettiarachchi

The first international scientific symposium on Agarwood was held at the University Putra Malaysia in September 2013. This was a rare gathering of scientists, planters, businessmen, government officials and more who share the same passion for Agarwood. Among the 105 delegates representing nearly 20 different countries, Wescorp Agarwood was represented by Tim Coakley, Danny Hettiarachchi and Jay Coakley. Danny presented a paper on Analysis of the Agarwood from induced cultivated *Aquilaria crassna* trees, which was co-authored by Tim Coakley of Wescorp and Eddie Vernon of Happy Farmers Lao PDR. This work was based on the analysis on Agarwood harvest in 2012 in Lao PDR using the CA kit method.

This first ever international scientific gathering on Agarwood was materialized and foreseen by Dr. Rozi Muhammad of Department of forestry at UPM. The symposium was also well represented by plantation companies big and small from the Agarwood growing region. A key feature of this symposium was that all the aspects of Agarwood were discussed in an open forum.

Every topic discussed and presented was interesting and useful making it difficult to summarize or select few presenters. Many of the attendees saw this opportunity to finally gather and discuss numerous studies conducted on Agarwood during the past several decades.

Researchers have found many different ways of inducing resin. The CA kit method developed by Prof. Blanchett during his work in Vietnam remains the most widely used method. There is a division among the scientific community on a possible mechanism for resin formation. Mycologists argue the effect is caused only by fungi, while chemists and botanists argue that any suitable stimuli could trigger the tree to form resinous sesquiterpenes.

There was a presentation and a discussion on the current CITES regulation on Agarwood and the negative impacts of that for the legitimate plantation wood. Representative from the CITES has informed the planters that this would be reviewed sooner for the betterment of the industry. Planters around the region seem to have issues with the current regulations and illegal activities.

A **scientific committee** representing scientists from all the different disciplines was formed during the symposium in order to collaborate on Agarwood research in the future. Danny was selected by the organizing committee to be a member of the scientific committee on Agarwood.

The symposium was followed by a very informative and enjoyable field trip. They have developed a novel inoculation method using suspension, which is dripped to the tree every two months. The Agarwood kept on display showed a thicken wall development but resin formation was very light. They have demonstrated the inoculation method on a tree in the garden. They also own a large distillery for Agarwood oil. The wood chips kept for oil distillation were much lighter than expected. However, the distillery is well equipped and gas powered. The condensing system and oil collection is more advanced than the conventional Agarwood distilleries. Next stop was a state managed Agarwood plantation, this is part trial and part investment by the government. They have trialed three species, *Aquilaria malacensis* which is the local species of the region, Thai and Vietnamese *Aquilaria crassna* and another wide spread species *Aquilaria subintegra* . This collection and possible hybrids grown here confused the attendees very much.