



The Australian Sandalwooder

Welcome to the 8th^h issue of the Australian Sandalwooder, a Natural Resources Benefits special edition produced by the Australian Sandalwood Network Inc.

Summer 2009

From the Chair

Bruce Storer, ASN Chairman

Dear Members

What a great year. Congratulations to outgoing Chairman Aaron Edwards and his committee. 2008 seems to me to be the year that things warmed up in the sandalwood industry. We have had the launch of the Industry Development Plan (IDP) that was launched by the Minister for Food and Agriculture, Forestry, Mr Terry Redman. The IDP outlines the state of the industry today and what the industry can become in the future. It also opens doors for us as a grower organisation to develop beneficial partnerships and research opportunities. Discussions with various industry players were fruitful and the ASN executive committee has met since the launch to continue to implement the IDP. We view this document as a road map that can assist us to get to where we want to go. We will need to refer to and update this document regularly if we wish to achieve the outcomes mentioned in it.

Other developments this year that are great news are:

1. Green immature wood realises a commercial value

During our tour of Wescorp on 2nd December (Thank you very much Wescorp) we were shown sandalwood powder/sawdust from young immature trees. Previously this would have been discarded and left in the bush. Wescorp has developed a market for this product and this is great news for us all.

2. Promising outlook for nuts

Research being undertaken indicates that sandalwood nuts contain unique compounds and whilst I do not fully understand these developments, I have been assured that there is a bright future for the sandalwood nut. The executive is working with the Sandalwood Association of Australia, comprising many industry players, to further research in many areas, including harvesting. We will keep you informed as things progress.

We have also established a marketing arrangement for seed supply to Landcare Services, so members please contact Bethan Lloyd if you have seed to sell. Whilst any member is free to sell their seed where and how they like, we urge you to help us help you and go through the ASN.

Hope you all had a great Christmas and New Year.

I believe that during 2009 we need to conduct a serious promotional drive to attract new members and see more sandalwood planted across WA. I think if a farmer has superannuation he should have 10 to 20 Ha of sandalwood. The industry needs more plantations to secure long term market supply.

Regards to all

NEW COMMITTEE FOR 2008-2009

Office bearers

Bob Huxley: Vice Chair Lorna Timbers: Secretary
Les Mactaggart: Treasurer

Committee Members

| | |
|-----------------------|------------------|
| Katherine Jane Taylor | Tony Ednie Brown |
| Monica Durcan | Geoff Woodall |
| Anthony Crum | Bethan Lloyd |
| Aaron Edmonds | Dave Macmillan |

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Mobile: 0427 293 639 or

E-mail: bernard.mclean@landcareservices.com.au



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STRENGTHENING THE DEVELOPING SANDALWOOD INDUSTRY ACROSS REGIONS TO ACHIEVE BIODIVERSITY, PROFITABILITY AND SOCIAL TARGETS

This project titled above was funded by SCRIPT, National Landcare Program and Coordinated by Greening Australia (WA)

All of us who took part in this project during 2005 and 2006 will never forget Tim Emmott a man on a mission who covered the far reaches of the Avon and Blackwood Catchments with amazing speed and enthusiasm to establish sites as part of this project.

All of the sites were established using a modified Chatfield treeplanter. Hosts were established using a combination of direct seeding and seedlings of over 25 species with the bulk being Acacias. Plantation design was generally paired rows at 2-3m spacing with 6-9 m gaps between these, depending on soil type and rainfall. The project sites cover a wide range of soil types and rainfall zones.

Herbicide treatments varied but with most sites a combination of Glyphosate and Simazine was used and Lemat was used to reduce the incidence of red legged earth mite

Site Establishment summaries for all the following sites including species lists are available to ASN members from the Executive Officer.

As the articles that follow show the project has been a huge success with many lessons learnt.

Toodyay 8km east of Toodyay 4ha Brown –Red loam - Bethan Lloyd

From the moment I visited Don Moir's site near Narrogin, I knew it was what I wanted on my property. In spring the site is a blaze of colour and the number and diversity of birds which are attracted to the site is amazing. Apart from the aesthetic and biodiversity aspects the growth of the sandalwood has been phenomenal and now at the end of 2008 sandalwood sown in 2006 is averaging 2m in height. The lower growing shrubs such as *Acacia lasiocarpa* protected the growing sandalwood well and the open canopy of the hosts has encouraged them to grow tall and straight in most cases.

The seed I have on my site was selected for good apical dominance which is certainly the case.

Initially there was some erosion in some of the scalping channels during the first summer due to the orientation of the rows, which buried a few of the germinating seedlings initially but they grew through and this stopped after plants established. I noticed that *Allocasuarina* species seem to dominate in the bottom half of the plantation, they are a lighter seed and with movement they settled to the top of the hopper and thus came out in greater density towards the end, these have been cut out and replaced with more *Acacia* species. *Acacia saligna*, even though I have the Wheatbelt form tends to overshadow the growing sandalwood. During summer I cut this as supplement for the sheep, allowing the sandalwood to grow through the plants.

Weed control has been an initial problem due to the fertile soils and good rain fall of 450 mls per annum. The space between the twin rows has been left due to inaccessibility. However now the plants are shading the area so it is not a problem. I think you can go too far with weed control, as someone pointed out recently sandalwood has been shown to fix on to some weed species so you shouldn't get rid of them all.

I am strongly aware of fire issues and have a 5m fire break right around my plantation and with good control of wild oats within the gaps

Future management activities will include to flattening out the spoil heaps created by the scalping, otherwise harvesting seed in couple of years is going to be difficult. I also hope to harvest seeds from many of the hosts starting this summer.

This year I harvested seed for the first time from previous plantings I have done. From now on I expect to be self sufficient in host and sandalwood seed.

My observations are when I compare the biodiverse sites with monocultures is that Biodiverse plantings act together as a plant community does in nature, this makes the planting more robust and resilient to the effects of climate change, and pests and diseases. In some areas the hosts are too thick but there seems to be a natural thinning process occurring as the plantation matures.

Kerry Malone - West Beverley

Our site was the first of about eight sites to be established in 2005 and although we received some rain to wet the soil in preparation for planting there was no rain after planting for approximately six weeks which I believe reduced the germination success significantly. Because of the lack of rain the schedule for planting other sites in 2005 was postponed until after good rain was received.

When the very poor germination rate was detected in August 2005 a check of the process used to prepare the seed was undertaken and found to be less than that normally performed for successful nursery planting.

The Eastern side of the plantation is adjacent to Kokendin Road which has a large rabbit population living in the road verge and although we implemented rabbit control measures on our property the migration of rabbits from the road verge caused significant damage to any germinating seedlings within 50 metres of the road. This rabbit damage consisted of severing the seedling at ground level with little or no recovery of the host plant.

The same day we established the plantation we also planted approximately 0.2ha of hand planted host seedlings with two pre-germinated sandalwood nuts pressed into the soil adjacent to each host.

There was a 95% success rate with the sandalwood germination but after the first year there has been very little growth of the sandalwood as the host has remained about the same size as when it was first planted.

During August 2006 we hand planted 5000 host seedlings along the existing rip lines after conducting rabbit control on our property however there was minimal rain after planting which reduced the survival rate to about 50%.

Hand planting of pre-germinated sandalwood nuts during 2006 on the more successful south west corner of the plantation produced a very successful 95% germination on mostly Acacia hosts.

No planting was undertaken during 2007 only rabbit control every 4-5 weeks and monitoring of the previous seasons sandalwood plantings.

During April 2008 we planted pre-germinated sandalwood nuts on most of the remaining hosts with a germination of about 85% and are now hoping we have no more problems while these get established and grow large to survive the rabbit attacks.

Looking back I think the main factor which governs the success rate is the rainfall immediately after seeding the hosts and throughout the first year and if this happens to result in a poor host establishment I would now recommend to start from scratch the next year using a weed control spray over the entire site and replant using the direct seeding process.

The process of hand planting seedlings in the large gaps between the surviving host plants was very time consuming and not all that successful.

The selection of host seed variety is very important as we have a large area where only Sheoak have survived and I believe weed control after 4-5 years would be best by control grazing by sheep however some of the host plants are toxic to sheep which limits the weed control and fire management process.

If I were to establish a plantation in the future I would definitely use the direct seeding method with very careful selection of the varieties within the seed mix and I would probably use a much heavier seeding rate than the 4.8kg for the 7.5 ha we used to allow for some germination failure and to produce a very dense host crop.

STRENGTHENING THE DEVELOPING SANDALWOOD INDUSTRY ACROSS REGIONS TO ACHIEVE BIODIVERSITY, PROFITABILITY AND SOCIAL TARGETS

Jim Ruggles West of Beverley

After a few hiccups, the site is now well established with an abundance of healthy host species and 1-3 year old sandalwood trees at approximately 400 stems per Ha. The host plants range from low growing forms to tall scrubs/trees 2-3 metres in height. The sandalwood trees range from just emerged seedlings (2008 infill) to 1.5 to 2 metre small trees (2006 planting). The site is very densely vegetated with host and sandalwood growing inter-twined and in close proximity to an array of host plants. Inter-row spaces are grass covered and are sprayed bi-annually before seed set to maximise the accumulation of biomass inter-row. This biomass keeps the ground cooler, reduces evaporation and slows run-off maximising moisture retention. The site by any standard is quite remarkable and the sandalwood growth is outstanding. It could be suggested that the number and variability of host species has contributed to the spectacular sandalwood growth. This variability may also reduce the disease risk associated with monoculture host plantings. The multi-species planting appears to have attracted more birds and native animals without any noticeable damage to the plantation. While sandalwood seed production is a goal, the production of host seed is an additional bonus, which will initially produce more income and fill a need for this valuable seed. At this point it is appropriate to list the positives and negative of the trial site.

Positives

- Multi-species hosts may produce faster sandalwood growth.
- Multi-species hosts may provide less risk of disease.
- Multi-species hosts do provide more biodiversity.
- Multi-species hosts do provide habitat for native birds and animals.
- Multi-species hosts do provide a range of valuable seed resources.
- Multi-species hosts do improve the appearance of plantations.
- Multi-species hosts may provide a more sustainable plantation system.

NEGATIVES:

- Establishment may be problematic on certain soil types.
- Weather conditions may cause wide variations in results.
- Supply of suitable seed resources is an issue.
- Planting toxic native hosts does create problems with neighbours.
- Well-established firebreaks are a must.
- High quality boundary fences are a prerequisite.
- Sandalwood seed will be a bit more difficult to harvest.
- Heavier machinery may be required to harvest sandalwood trees.

In conclusion it appears that multi-species hosts are a better sandalwood host system than mono-species systems for a variety of valid reasons. Though a little more difficult to establish the effort can produce a more diverse income stream as well as a more diverse ecosystem. If the goal is building a sustainable sandalwood industry whilst improving biodiversity then multi-species sandalwood host plantations may assist in achieving the stated goal.

Jim's plantation below

Members will recall that we visited Jim's site at the field day last year on 7th April



STRENGTHENING THE DEVELOPING SANDALWOOD INDUSTRY ACROSS REGIONS TO ACHIEVE BIODIVERSITY, PROFITABILITY AND SOCIAL TARGETS

Katherine Jane and Merv Taylor South of York 8ha site

Site was established in winter 2005 but we did not notice very much germination of the hosts until the spring of 2006. The *Acacia saligna* had taken off. Well so much so that early the following year we were forced to heavily prune back the *Saligna* so that the young sandalwood could get some light.

April of 2007 we continued to plant sandalwood nuts. These nuts we planted about 6m apart. At last, we could see the efforts of the direct seeding had worked. Spring of 2007 showed good germination of sandalwood seed and the host trees were prolific. Some of the Sheoaks which had at last decided to grow were badly grazed by the locusts earlier in the year. However by spring they had pretty much recovered and the seedlings of *Saligna* were back to their pre-pruned size, if a little lopsided. Host and sandalwood growth was quite poor in the first two rows close to the highway due to the existing shelter belt growth or simply poorer soil. The plantation closer to the river is doing best.

Spring of 2008 we have a dense display of a large variety of hosts. It seems that the direct seeding worked VERY WELL, if a year or two late. The hosts have come up in close clusters in very straight lines, then gaps of not much at all. There are sandalwood trees producing nuts and sandalwood seedlings which have only just germinated. As we didn't plant seeds this year, we can only assume that they are nuts planted in the previous years. The original *Acacia saligna* seedlings are suffering and some have died, however, their sandalwood trees have found other hosts and are doing very well.

There is now an abundance of other hosts and a lot of *Acacia acuminata* which were completely absent for the first year or so. In 2009 we will fill in the gaps of both hosts and sandalwood that are apparent. We have done nothing in the way of weed control except for slashing the wide paths between each double row. Weeds continue to proliferate and may have caused the slow germination of seeds. We do not know. The plantation is doing very well but it is difficult to know how many sandalwood seeds are still in the ground and may germinate next year. We have identified trees which we believe to be three years old, from the original "Same Day Trial". Two year old trees from our first nut plantings and then some which have come up this year from the 2007 plantings or simply germinated last year but did not grow very well.

The ratio of sandalwood to host is not as great as we would like it and there are still a few gaps of hosts, mostly in the area which was originally waterlogged and in the top two rows. We still have a bit of work to do, but take great pleasure and pride in the plantation as it is.

From our observations the area has provided habitat for a variety of wildlife and acts as an extension to the riparian corridor along the Avon River. There has been no more waterlogging at the site and aesthetically it is a wonderful asset to our property.

STRENGTHENING THE DEVELOPING SANDALWOOD INDUSTRY ACROSS REGIONS TO ACHIEVE BIODIVERSITY, PROFITABILITY AND SOCIAL TARGETS



Mid slope landscape setting of 4ha Bio diverse plantation at Bethan's East of Toodyay



Wide spacing of rows at Katherine Janes' 8ha plantation near York



Kerry Malone's plantation at West Beverley

SANDALWOODERS IN ACTION

PAUL AND GERALD SACHSE, BENCUBBIN



Paul and Gerald standing next to a remnant Sandalwood tree on Gerald's property

Paul and Gerald are both farming on the wodjil soils around Bencubbin . Natural vegetation cover is mainly (*Allocasuarina campestris*) and *Acacia resinimarginea*) .

Both Gerald and Paul 's sandalwood plantations have been established in the last couple of years amongst a surge of interest in their area in growing Sandalwood which historically was very important in this area .

They have used a mixture of locally native host s and species well adapted to their area including the fine leaved variant of *Acacia acuminata* and have used a combination of direct sowing and planted seedlings in paired rows. Their farms have large areas of Wodjil Soils which are very light and in general are low productivity soils when used to grow traditional crops such as wheat. In dry years as we have recently had, production, is further reduced . The nature of these soils make it essential to maintain soil cover on them at all times to prevent wind erosion so in these circumstances Sandalwood is a very good option . On a recent site visit bare areas such tracks and fire breaks were showing considerable build up of sands against existing vegetation .

Paul and Gerald have left weeds such as Mulla Mulla in situ between the rows of Sandalwood in order to give this protection to the soil. Once the sandalwood is established soils will be protected .

Gerald and Paul have both been applicants in past and present incentive scheme projects run by the Avon Catchment Council to integrate tree crops into farming operations to address issues such as salinity , water quality , wind erosion , water logging and improve bio diversity . Apart from Sandalwood they have integrated other tree crop species such as Brushwood where site conditions favour their establishment .



Typical wodjil country around Bencubbin area . Soils easily blown if they are not covered by perennial vegetation. Large tamma sheoaks native to the area are on the left .

From the Executive Officer

It has been a busy year with many challenges and lots to learn . Hope you enjoy this 8th edition of the Sandalwooder which is the first I have put together. The emphasis in this edition is the Natural Resource Benefits of Growing Sandalwood. Thanks to all those who sent in their articles for this edition

Major steps for last year were the launch of the Industry Development Plan (IDP) in September . The challenge will be now to implement the plan and the vision of 50,000ha of sandalwood (*S. spicatum*) planted by 2020.

In 2008 we reviewed our membership fees to reflect costs . The fees are I believe still good value with grower memberships from \$110 which gives free entry to field days .Associate membership is \$60 which gives reduced fees to field days . All members receive the benefits of newsletters, access to purchase good quality seed for plantation establishment and access to the peer mentoring programme . We hope to offer further benefits in the future. As a member you have a voice in the industry which will become more important as time goes by .

At present we are down on membership , I suspect this is because many people joined late last year and don't realise they are not members .The membership period runs as the financial year. Please check with the EO to check your membership status. Unfortunately we will not be able to send out newsletters to non members in future.The formation of the SAA is a very positive development for the sandalwood industry .It is made up of industry representatives including those representing Indian Sandalwood. ASN is one of those members. Collectively we should be able to implement the IDP and progress some research that has been prioritised by the group.

I have recently spent a few days travelling around the North and East of the Wheatbelt looking at potential sites for sandalwood plantations . The landholders concerned are applicants for The Avon Catchment's Council incentive scheme . Unfortunately not all applicants will be lucky as the scheme is over subscribed but there are some great sites. I look forward to assisting those applicants in establishing their plantations.

For 2009 we have a new chair and committee. A big thankyou to them for volunteering their time. Hope to catch up with you in 2009

INDUSTRY DEVELOPMENT PLAN FOR SANTALUM SPICATUM

PLANTATIONS IN WESTERN AUSTRALIA

STRATEGIES AND KEY ACTIONS TO GUIDE THE

DEVELOPMENT OF THE SANDALWOOD INDUSTRY IN SOUTHERN WESTERN AUSTRALIA OVER THE PERIOD 2008-2020

Over the last ten years the establishment of tree farms of native WA sandalwood, *Santalum spicatum* in the agricultural zone of southern Western Australia has accelerated. The objective of this development plan is to identify the strategies and recommend key actions required to ensure the growth of a sustainable and profitable industry based on this native species. The plan also takes account of an emerging industry in the tropical north of the State, based on plantations of Indian sandalwood, *Santalum album*.

The plan sets out the following strategies, each with supporting recommended key actions:

- Secure the position of Australian sandalwood (*S. spicatum*) in the market place.
- Develop and maintain a strong research program to underpin industry development.
- Improve the mechanisms for industry cooperation.
- Expand the *S. spicatum* tree farm estate.
- Promote high standards for grower performance and product quality.
- Seek State Government support during the critical period to 2020 when the tree farm resource will be phased in .

The IDP can be downloaded from the FPC or ASN website at the link below or for a hard copy contact the Executive Officer of the ASN on 9574 5882

http://www.fpc.wa.gov.au/content/plantations/industry_plans/plans.asp

Useful website

Need tools to manage your plantation

www.forestrytools.com.au

Press Release Minister launches plan to revitalise WA sandalwood industry

A significant export earner for Western Australia in the nineteenth century is set to reemerge with the launch of a plan to develop WA's sandalwood tree farming industry.

Launching the Industry Development Plan today, Forestry Minister Terry Redman described it as a blueprint to enable product from planted tree farms of WA sandalwood to gain a foothold in already established markets.

"The international demand for sandalwood oil and wood has been strong for centuries. Renowned worldwide for its pleasant fragrance, oil from various sandalwood species is well known for its importance to many Asian cultures," Mr Redman said.

"Although native stands of WA sandalwood continue to supply some of the market, it will not be possible for those stocks to meet increasing demand from the burgeoning populations of countries like China and India.

"With approximately 13,500 hectares under cultivation on tree farms in the Wheatbelt, WA sandalwood (*Santalum spicatum*) has developed into a growing tree farm industry through the efforts of the Forest Products Commission, individual farmers and private companies like Rewards Group.

"When integrated into the farming landscape, sandalwood tree farms help address environmental challenges in the Wheatbelt, assist farmers to diversify their income, create new jobs and help rural communities to achieve greater economic resilience."

Mr Redman said it was likely the fledgling industry would experience challenges brought on by the gap between growing demand and available supply from natural stands and the time lag before products from tree farms would flow through to markets.

"However, growth in existing tree farms has been positive and the industry continues to build a bank of knowledge about sandalwood oil production, all of which should all go well for the future," Mr Redman said.

INDUSTRY DEVELOPMENT PLAN FOR SANTALUM SPICATUM PLANTATIONS IN WESTERN AUSTRALIA

STRATEGIES AND KEY ACTIONS TO GUIDE THE
DEVELOPMENT OF THE SANDALWOOD INDUSTRY IN SOUTHERN WESTERN AUSTRALIA OVER THE PERIOD 2008-2020



Bruce Storer (Chairman of the Australian Sandalwood Network), Hon Terry Redman MLA (Minister for Agriculture and Food; Forestry) and Dr Paul Biggs (General Manager of the Forest Products Commission) at the launch of the Industry Development Plan held at Wescorp on 2nd December 2008.

Attendees at the launch were welcomed to country by a group of aboriginal dancers led by Dr Richard Whalley

After the launch and the speeches we were given a tour of the Wescorp and New Mountain facility. It was fascinating to see the diverse range of products being made from all parts of the sandalwood tree.

Avon Catchment Council (ACC)

'Integrating Trees into Sustainable Agriculture 2008/09

by Monica Durcan '

The Avon Catchment Council (ACC) has secured funding from the Australian Government and the State of Western Australia for projects that aim to achieve an environment in the Avon River Basin that is healthier, better protected, well managed, resilient and provides essential ecosystem services in a changing climate. The *'Integrating Trees into Sustainable Agriculture 2008/09'* Project is being delivered by the Delivery Organisations AVONGRO and the Forest Products Commission (FPC) through a variety of smaller contracts.

AVONGRO has taken responsibility for Brushwood, Sandalwood hosts and Oil Mallees and has sub contracted the Sandalwood component of the project to the ASN. The tasks will be undertaken by the Executive officer. The Project will run from the end of October 2008 till the end of June 2009. The focus of this Project is on protecting the Avon's soil assets at risk from wind and/or water erosion, salinity and/or water logging.

This is a new ACC Project that aims to expand grower understanding and increase the quality adoption of sustainable farming practices through increased establishment of trees on agricultural land through integration into wheat and sheep farming systems. The Project will utilise local farmer group networks to plan, demonstrate and implement measures to manage the integration of three key species suited to the Avon River Basin.

Several proven methods of extension will be utilised in this Project to ensure successful information exchange and ultimately the adoption of tree crops in Avon farming systems.

Expected Project Outcomes of this Project:

- Improved soil management practices adopted by landholders as a result of raised awareness of benefits of tree crops in agricultural land.
- Increased amount of soil management due to establishment of tree crops on agricultural land.
- Successful adoption of tree crops in farming systems as a result of technical support and information provided to landholders.

Australian Sandalwood Network Field Days for 2009

The ASN will be holding three Field Day Events in 2009

The first will be held in the North Eastern Wheatbelt on **Saturday 14th March 2009 in Koorda at the Recreation centre from 9:30am**. Speakers will be Dr Geoff Woodall who will speak on the latest thinking on plantation establishment and layout and the on farm benefits of sandalwood plantations. In preparation for the new season Anne Cochrane from Dept of Environment and Conservation and John Brand from FPC will talk on their relative expertise in Hosts species and Sandalwood. Have your questions ready. There will be a visit to plantation sites in the area if you wish to attend. Due to sponsorship from the ACC for this event will be free to all members. The charge for non members will be \$30. Lunch and Morning tea will be provided. The field day will be part of a Farm Forestry Road show event happening in the NE wheatbelt. For more info or to book contact the Executive officer on 9574 5882

Notifications will be sent out shortly to all ASN members and posted in local press releases, as well as on the ASN website (www.sandalwood.org.au).

The Avon Catchment Council (ACC) through its Project Integrating Trees into Sustainable Agriculture will assist in the delivery of this field day in the NE Wheatbelt

Other field days will be held in the Northern Agricultural Catchment (NACC) and the South West Catchment (SWCC) regions. Exact locations and dates for these are yet to be arranged.

Assistance from NACC, SWCC and FPC in bringing field days to you is acknowledged and greatly appreciated by the Australian Sandalwood Network Inc.

Major sponsors are The Avon Catchment Council and Lotterywest.



Field day fees for 2009

All Grower Members receive FREE entry to field days in 2009!

Associate members \$35

Non-members \$50

Want to become a member : Contact the Executive Officer on 9574 5882 or by email at exec@sandalwood.org.au or download a form from our website at www.sandalwood.org.au

Grower memberships from \$110 - \$220

Sandalwood Association of Australia

Inventory of the Australian Sandalwood Network

Sandalwood Association of Australia meeting was held at Wescorp on 27th November . Representatives from Rewards ITC, Wescorp, and FPC were in attendance . Liz Barbour from FPC informed us of two research proposals which she has submitted to RIRDC for consideration for funding. She is seeking funding from the industry for these projects .

Seed harvesting logistics for Native sandalwood (*Santalum spicatum*)

1. Investigate how present plantation systems can be converted to mechanized seed harvesting systems to reduce costs .
2. Review transport distances and processing facilities required to maintain profitability of the seed crop.
3. Investigate the social implications of a developing Native sandalwood nut industry in the wheatbelt of Western Australia through the development of an industry network.

Certification and identification of products from the West Australian Sandalwood (*Santalum spicatum*) for human consumption. Sandalwood nut commercialization has stalled due to two aspects:

1. A Patent, US 2004/0115331 A1 Ximenic acid compositions, methods for their production and use thereof, was lodged that has defined possible restrictions on the development and use of Sandalwood nut products. There is a need to understand the legal and chemistry implications of this patent.
2. The West Australian Sandalwood nut requires certification for human consumption, both as a food product and oils for cosmetic use.

Other business

3 Members were elected on a research sub committee Some members were to consider standards for products from plantation industry . The was also a reports on the inventory and markets. For further info on the SAA Contact Exec Officer of the ASN

Thanks to our members for sending in their inventories .The following is an estimate shire by shire of ha of *S spicatum* currently in the ground by ASN members . I am sure there are more plantations not recorded as not all members have returned their inventories and of course all growers are not in the ASN. . It's not too late to send in your inventory now This list does not include MIS plantations

| | | |
|------------------------|--|--------|
| Dalwallinu | | 1.5 |
| Tammin | | 3 |
| Gnowangerup | | 200 |
| Mt Marshall | | 423 |
| Wongan Ballidu | | 8 |
| Toodyay | | 15.5 |
| Westonia | | 52 |
| Chittering | | 27 |
| West Arthur | | 176 |
| Brookton Beverley | | 182 |
| Esperance | | 10 |
| York | | 21.5 |
| Irwin | | 8 |
| Greenough ,Northampton | | 57 |
| Quaraiding | | 60 |
| Pingelly | | 23 |
| Vic plains | | 203 |
| Kelleberin | | 18 |
| Northam | | 38 |
| Dowerin | | 9 |
| Marg river | | 0.5 |
| Kendenup | | 2.5 |
| Badgingarra | | 20 |
| Koorda | | 36 |
| Chapman Valley | | 0.5 |
| Merredin | | 13 |
| Kattaning | | 2.5 |
| Cuballing | | 4 |
| Serpentine | | 9 |
| Kulin | | 1 |
| Donny Brook | | 6 |
| Trayning | | 19 |
| | | 1649.5 |

Average density of sandalwood is 150 stems per ha but density varies depending on area

Seed Matters

To ensure good germination of Sandalwood

- **Purchase good quality seed**
- **Sow nuts into warm and preferably moist soil (break of season)**
- **Use a spade, pottiputki or machine (egad)**
- **Use cracked nuts**
- **Sow at a depth appropriate for the soil type**
- **Balance host root availability and soil moisture**



This year you can contribute to the ASN by selling and buying your seed in the following way .

For all those who have sandalwood seed for sale.

Please contact Landcare Services .

Contact bernard.mclean@landcareservices.com.au .

Address is 19 McDonald Crescent, Bassendean 6054, which is the delivery address.

Office Hours are 8:00am - 5:00pm Monday to Friday.
Phone number is 9270 0999 or mobile 0427 293 639.

Bernard has said he is interested in smaller amounts so don't think you have to have tonnes for him to be interested .

Please make sure that all those selling seed have the correct licenses etc.

All those who want to buy seed for the 2009 season

Contact Bob Huxley his email is bob_huxley@bigpond.com Phone 9684 8008 Mobile 0419 961 254 .

Cost will be \$50 per kg of cleaned seed and Bob will donate \$2 per kilo to the ASN.

Buyers will have to pay for postage and packing and Bob is able to offer cracking and fungal treatment if you take delivery of seed near to the planting time . He will charge \$5 per kilo for this service .

Members will get preference we expect non-members to be supplied subject to demand and availability.

MANY THANKS TO Bob for providing this service

Acacia species information

For growers seeking further information on various Acacia species ,such as distribution ,soil type, landscape position, images etc . Have a look at

WWW. worldwide wattle .com

Benefits of growing Sandalwood

Natural Resource Benefits of incorporating Sandalwood into your farming system

Sandalwood is a West Australian native plant with strong cultural and historical links to early pioneers and aboriginal people. It is a sustainable crop unequalled in Western Australia with the potential to improve economic and natural resources outcomes across regional Western Australia. The aim is to get 10% of tree cover on farming properties, this is very achievable by including the fencing of remnants, planting of riparian areas and shelter belts as well as including planting for commercial, aesthetic and farm production goals.

Sandalwood is a low input crop, well adapted to poor soils and low rainfall, requiring no irrigation or fertiliser and little in the way of herbicide and pesticide use.

Sandalwood functions through being a hemi parasite on nitrogen fixing hosts mainly Acacia species as fertilisers or irrigation are not required they are not available to leach through the soil to pollute waterways thus reducing algal blooms and weed growth. Perennial vegetation such as Sandalwood which fixes nitrogen enables and increases the recycling of nutrients between the plants and the soil which build up humus, earthworms and micro organisms thus maintaining the ecosystem services and fertility of the soil.

Sandalwood grows on a range of vegetation associations across the Wheatbelt. The need for these species helps in their direct conservation as they are linked to a commercial outcome. The extra benefit of good prices from the wood and from seed after 5 years give an extra incentive to growers to provide income in the future for retirement etc.. Profits from Sandalwood plantations also enable the further planting of plantations and direct funding of other conservation projects on farming properties.

Sandalwood and its hosts are all deep rooted perennial species which act as pumps keeping ground water levels low and reducing salinity and waterlogging in susceptible areas.

Sandalwood is a native plant which will never become a weed in any circumstance. However care should be taken when choosing hosts. Some species such as Acacia saligna and some eastern state Wattles have the potential to become weeds. If you choose hosts native to your area you will not create a weed problem and the hosts will be pre adapted to conditions at your site.

Sandalwood Plantations are often bio diverse containing a range of plant species chosen to match local conditions of soil type and rainfall. Sandalwood plantations create habitat for a wide range of fauna and can be used as linkages to connect other areas of remnant vegetation. Sandalwood plantations protect, conserve and increase the functionality of existing remnants when used as buffer plantings. Some of the host species such as Acacia saligna support large populations of small beneficial insects such as spiders which in turn provide food and shelter for small birds. Many of these small birds also control flies responsible for fly strike. Small insectivorous birds are in decline in the Wheatbelt due to lack of understorey plants.

Other plant species such as Hakeas and Grevilleas often used in sandalwood plantations provide food for honeyeaters and other nectarivores, while the seed of some species are a food source for endangered species such as the Carnaby's cockatoo. Populations of Bats and spiders are important in reducing numbers of flies and mosquitoes. Other species such as Magpies feed on cutworms and other soil pests.

Sandalwood plantations can be used as windbreaks and shelter belts to provide a reduction in wind speeds across the farming property. The slowing of hot drying winds in summer and cold winds in winter have obvious benefits for livestock such as protection of lambing ewes and general improvements in the well being of all animals shown as increased weight gain. The aim is to have a series of open paddocks on the most productive land surrounded by dense forest. *pto*

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Plantations of native species such as Sandalwood can prevent soil erosion by wind on exposed sites which have lighter soils and can be planned to improve water infiltration and reduce the effects of water erosion.

Many landholders pay the same local government rates for areas of remnant vegetation as they do for traditional cropping areas. Often although these areas may provide shelter and reduce rising ground water levels, farmers often receive no direct income from these areas. Sandalwood can be incorporated into existing remnants to provide an income stream while retaining the on farm benefits.

To maintain and improve the NRM benefits of sandalwood plantations and the creditability of this fledgling industry no remnant vegetation should be cleared to accommodate sandalwood plantations. Establishment should be on cleared land. Where Sandalwood is incorporated into existing remnant vegetation areas, this needs to be documented if trees will need to be harvested in the future.

In areas where small mammals such as woylies exist the sandalwood seed provides a valuable food source to help their survival. The woylies in turn help the distribution and regeneration of sandalwood by their caching activities.

For further information on this beneficial relationship see\ *Tandem conservation of the Woylie and Santalum spicatum* by Lorna Timbers in the 7th edition of *The Sandalwooder* and a paper by Murphy, Alkalis and Hardy entitled *Seed Caching by Woylies (Bettongia penicillata can increase sandalwood (Santalum spicatum) regeneration in WA.*

Bio diverse planting of hosts and sandalwood act together as a plant community does in nature; this makes the planting more robust and resilient to the effects of climate change, and pests and diseases.



**Willy wagtail nesting in host
Acacia meisneri**



**Matt Edmonds measuring the growth of
Sandalwood in corridor plantings at Bolgart**

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Case Study

Matt Edmonds North of Bolgart

Matt farms in the Solomon Yelgun Catchment North of Bolgart. The property is within the Drummond Recovery Catchment. The focus of the recovery catchment is to improve land management practises to ensure that Drummond Reserve is protected from rising ground water and salinity. As part of the project on Matts property recharge areas are identified and revegetated and remnants and wetlands have been connected by corridors of vegetation. Over 13 years Matt has been active in instigating projects on his property to improve on farm outcomes, address land degradation issues such as waterlogging and salinity and reduce erosion risk on lighter soils. He has also used some of the less profitable areas under traditional cropping to try some different ideas and diversify into trees which will give a return and improve the long term sustainability of his property. An added bonus is of course is the improvement in aesthetic values.

Although nowadays Matt's focus is on Sandalwood he has several demonstration sites on his property of interest. As you enter his property, you are greeted by a long avenue of Eucalyptus species and areas of remnant wandoo which have been fenced, underplanted and allowed to regenerate with understorey species. As you pass over a drainage line a waterlogged area is planted with a trial of *Melaleuca acuminata* (Search project) which are used for tea tree oil.

Other projects include an *Acacia Saligna* provenance trial through the Florasearch project, a Eucalyptus species and Management demonstration which used a selection of Eucalyptus species, and a low rain fall demonstration site which looks at the growth of differing provenance selections of *Eucalyptus camaldulensis*, a *camaldulensis* x *rudis* and *occidentalis*.

Fenced corridors containing *Acacia* species connect remnants and wetlands and run around the perimeters of the cropping areas. These corridors have been progressively sown with sandalwood seed. From higher ground on the property a green framework is apparent which combined with no till farming methods is protecting cropping areas from wind erosion.

Matt has noticed considerable improvement in previously waterlogged areas and does not experience any blowing soils during dry periods. Matt has also experimented with drains to reduce saline area on his property but is not enthusiastic about the benefits compared to the costs.

A 7.5 ha site biodiverse site established in 2005 as part of the SCRIPT, National Landcare Program and Greening Australia project, coordinated by Tim Emmott and assisted by Bob Huston from DEC who funded the cost of seed, seedlings and fencing used for this site within the Drummond recovery catchment.

The site was established in an area of sandy loam soil which was often waterlogged until later in the season making the area difficult to crop. The plantation was established using 20 different species half of which were *Acacia*'s with single rows spaced at 4m using direct seeding at 700gms/ha and 600 seedlings/ha.

Overall Matt is pleased with this site. As of spring 2008 some of the sandalwood are couple of metres high. The planting has used the excess water on the site and besides keeping salt from coming to the surface the plantation has provided understorey species to help protect and buffer adjacent isolated remnant wandoo. The introduction of tree crops has enhanced the property visually and with careful and strategic planning has reduced some of the land degradation issues with positive benefits for the cropping side of the farm.