SANDALWOOD GROWERS' INTERVIEWS **SUMMER 2010**

PROFILE Bob and Ros Huxley

"Plantations on the poorer soils is the way to go—it's a simple system."

—Bob Huxley

Property

Farm name: Bob and Ros Huxley

Location: Gabbin, Central (NE) Wheatbelt in WA

Catchment Group: Mt Marshall NRM Committee and Lake McDermott Catchment Group

Rainfall: 310mm

Soil types: 25% light/Wodjil land, 25% medium, 50% salmon gum/gimlet — 'user friendly heavy land'

Farm size: 1,200 hectares

Enterprise mix: 800 hectares wheat, sheep and 240ha agroforestry — 'need to use every square foot of the farm to 100% keep the bank happy'. 90% of the arable land is salmon gum/gimlet — very good productive country for the area.

Species planted: 240 hectares mainly local hosts and Sandalwood on light land (wodjil and deep sands)

Been planting since: 1999

Number planted: About a million mainly host trees, a few oil mallees and brushwood, on his own land and 450,000 planted for other landholders on either a contract or 'barter' system. A lot of hosts more recently have been established by direct seeding.

Overall success/survival rate: Droughts, a grasshopper plague, water resistant areas, bare-rooted stock where initial survival is 70%. 'terrorist rabbits and 28s' can decimate a plantation'. Bob estimates a first year survival rate of about 65%. Some good years are higher and dry years are lower. Infilling is required to keep the host stocking rate around 1,000 or more per hectare.

'So the initial survival rate is about 65% but the success rate is 100% because it is fun putting something back into the country which has given so much to me and my family.' Said Bob.

Approximate % of the arable land planted: 23 %

wheatbelt natural resource management

Australian Sandalwood Network

SUCCESSFUL CONSERVATION WORK

Bob Huxley comes from a family that has been farming at Gabbin in the eastern central wheatbelt since 1922. Bob left the area in 1977 at the age of 27. He studied for his Bachelor of Social Work degree at Curtin University and worked in the field of addictions treatment for ten years.

A bit worn out from trying to 'save the world' he purchased a 41 foot Jarrah plank fishing vessel, studied for his Master Class V skippers ticket and spent the next few years shark fishing and wetlining from Mandurah to the Abrolos.

A bit like Rip Van Winkle 1997 he returned to the farm having and decided that he needed to make the enterprise more environmentally and economically sustainable and started on the road to what is now his main passion — planting WA Sandalwood (Santalum spicatum) on a large scale. Bob likes Sandalwood as it is iconic of the WA wheatbelt, native to the Mount Marshall area and grows well on soils which are not very profitable using traditional farming methods.

Bob enjoys the diversity of farming and likes the mix of cropping, merino sheep and tree cropping. He is proud of his breeding flock of about 800 AMS ewes whose wool averaged under 18.5 microns and returned 680 cents/kg for the top line of wool when sold last year.

However he has noticed a change in the rainfall pattern over his lifetime and

> "NOTHING WILL GROW WITHOUT RAIN. WHEAT IS RELIANT ON RAIN COMING AT A CERTAIN TIME WHEREAS TREE CROPS ARE MUCH MORE FLEXIBLE AND BENEFIT FROM THE RAIN WHENEVER IT FALLS."

believes that future agricultural production systems need to be more flexible and diverse than they are now.

Bob remembers Sandalwood from his childhood 'I remember the kitchen fire being lit in the mornings with Sandalwood twigs and it smelled nice'.

Caption for map

Since 2000 Bob has planted 20 to 40 hectares every year on parts of the farm that were not yielding a return from grain growing. Bob has found that it is just these areas that the Sandalwood particularly likes. 'Sandalwood grows in harsh but very varied conditions' and has focused on the wodjil soils of his farm. Bob's property is small by WA Wheatbelt standards and by 2009 he had planted all soils unproductive for European style agriculture to Sandalwood. Even Bob is reluctant to plant his good wheat land to Sandalwood so he is focusing more and more on helping others.

Financial returns in general for the eastern Wheatbelt are tight ('Each year Ros and I have to make $35,000 to pay the bank interest before we make any money') and Bob feels that there are vast areas that would be more environmentally and financially viable if planted to Sandalwood. Bob's vision for the region is to have enough Sandalwood planted to provide sufficient resources for a local value adding industry in the future. This will mean local jobs as well as income for the farmers. 'If 10 to 20% of the wheatbelt were planted to woody perennials — the environment will benefit but also there will be plenty of resources for new local industries'.

'The most endangered species in the wheatbelt are the people', Bob said, 'about 15 years ago there were about 12,000 registered wheat farmers, now there are less than 5,000 on the books at CBH. There is nowhere for people to fit, not enough population to keep the communities and the culture going.' Bob has great faith in the Sandalwood industry — that it will grow and develop and provide a much needed boost for rural communities.

BOB'S JOURNEY

At first, with absolutely no experience in tree planting, Bob hand planted 500 gimlets in a degraded area around his house — and lost all but one tree. Determined not to fail he replanted and started talking with others. He learned from the best in the field at the time, making his own observations and adjusting what he learned from other areas to suit his local conditions. It was discussions with advocates of planting native species with commercial potential that inspired Bob to plant his first Sandalwood plantation.

What he did	What he learned
1999 — Bob planted about 500 single hosts (jams) and Sandalwoods that were growing together in one pot.	With this method the host and Sandalwood are too close when they mature and the brittle Sandalwood root can become damaged at the time of planting. It is also a very expensive and time consuming way to establish a plantation as individual pots were large and heavy.
Bob heard that Sandalwood was hard to establish on red dirt so he put in irrigation.	Irrigation is an unnecessary expense. Choosing the site well and timing the planting have had the best results.
2000 — Bob planted the 10ha plantation on Gimlet country by his house. He protected each seedling with an onion bag and put in 18,000 bamboo stakes making 6,000 tree guards. It was a bad year for grasshoppers. They did not eat the Sandalwood seedlings but ate almost all of the hosts so Bob had to replant the hosts in the entire area.	• Tree guards expensive and time consuming; and • a biodiverse system reduces the risk of insect attack and diseases.
2001 — Bob planted a plantation with using all one host species — the tough Acacia acuminata. Even so over 90% of these were eaten — he vowed never again to plant a monoculture. This is when Bob started working on the 'biodiverse host' approach.	Bob now firmly believes in planting a mix of host species — if one species fails or is targeted by pests, there will be plenty others to carry the plantation through. biodiverse species are also used to try and mimic a more natural system and provide habitat for native fauna.
In the early days of the emerging Sandalwood industry when Bob first learned about Sandalwood he was told that the seeds had to go through an Emu in order to germinate. Bob did not quite relish the idea of chasing emus around his property so tried to devise other methods. Initially Bob cracked the seeds individually on a short length of railway line using a small bootmakers hammer. On advice from one of his contacts Bob soaked the seeds in a weak bleach solution for six hours to protect the seed from any fungal growths and to kill any pathogens. Once the seed was removed from the bleach solution he would line them up in the sun and sit down and crack them with the hammer. After a while Bob could hear a clicking noise that sounded like rice bubbles popping.	Sandalwood seeds do germinate better if they are slightly cracked prior to planting. This allows the moisture to enter the hard outer shell and swell the inner kernel.
In 2000 Bob germinated 6,000 Sandalwood seeds on his back veranda using humidicribs, heat blankets and, giberalic acid (hormone/dormancy breaker). He waited for the brittle radicals to emerge 1.5cm to 6cm and then carefully transported the germinated Sandalwood seeds to the paddock and planted them beside the host. This was painstaking work. Bob also had the added problem of not being able to get into his house. Once the seeds had been sown, Bob planted the hosts for his ten hectare plantation, using endemic native biodiverse species. He also trialled bare-rooted Acacia acuminata amongst the other hosts.	It is not necessary to pre-germinate the seed. The brittle radicals are easily damaged.

	• Bob realised that the soaking of the seed followed by the warming in the sun was actually gently cracking the seed for him. Bob now does the soaking and sunshine routine two or three times and gets about 70% germination rate or better. • It is currently standard practice to plant the hosts first and direct seed the soaked and sun-cracked seed the following autumn.
One thing that Bob has learned since branching into Sandalwood was that in drier years it is difficult to establish hosts on the red land (gimlet soil). A standard procedure of Bob's is to conduct extensive infilling of mainly host and some Sandalwood on the red dirt.	Any future plantation establishment on red land will be preceded by ripping and running out a solid dose of gypsum along the rip line followed by the crushing of the soil peds. Bob has found that establishing Sandalwood on red land is far more difficult than on the lighter wodjil soils. However the red soil is considered preferable to wheat farmers.
2003/04 Apart from the previously used biodiverse seedlings and bare-rooted stock, Bob tried direct seeding of host species and Sandalwood seeds at the same time. The technique of direct seeding the host tree seed has been developed and demonstrated as very successful by Prof. Geoff Woodall.	Bob found it important to use a higher density of host seed to compensate for any inhibiting effects of planting the Sandalwood seed at the same time. This was a ground-breaking move in a region that receives and average of 310mm of rainfall per year. Industry observers were sceptical. This plantation was planted with dual rows 2.5m apart. The dual rows were spaced at 8 to 12m apart. The Sandalwood seeds were planted 3 to 5m apart. This plot is now looking extremely healthy and producing an annual crop of Sandalwood nuts.
	In 2004 Bob started pruning the Sandalwood trees from his earliest plantation. Pruning is done to encourage long straight stems, good seed production and enabling ease of seed collection. Bob also believes that sheep can be useful in pruning Sandalwood trees and hosts as long as the trees are over 2 metres tall and the sheep are not left in the plantation too long. Another benefit of allowing sheep entry to the plantation s to keep the weeds and grasses down, thereby lessening the fire risk.

In 2010 Bob is planting up to 25 local native species in every plantation he establishes 'Trying to replicate nature a bit'. For a 100 acre block Bob will use about 1/3 to ½ a kilogram of seed of a biodiverse mix plus some bare rooted seedlings. 'if you can get a grant then that's great but this way gets the job done without too much financial stress.' The hedgerow of hosts provides a smorgasbord of nutrition sources , early vigour, protection from pests. An important side benefit is that the young sandalwoods grow straight up with a single main trunk as they reach for the sun above the hedgerow. Bob believes that at least 5 hosts per Sandalwood in the eastern Wheatbelt will better support the Sandalwood as they mature.

Bob has since established about 300 hectares on his own farm. (The price he got when selling a small farm near Koorda returned an extra $100,000 due to the young 60 ha Sandalwood plantation he had established on that block.) and about 200 hectares on 10 to 20 other farms but Bob is the first to admit that 'things do not always work out perfectly'.

The direct seeding techniques that Bob had adapted from what he has learnt from professionals like Dr Geoff Woodall and Greening Australia has significantly reduced the establishment costs of Sandalwood plantations. 'it is something anyone can do even in tough times'. Bob supplements the direct seeding with bare rooted seedlings that he has been sourcing from Bridgetown for ten years. Bob gets between 10,000 and 50,000 bare rooted seedlings (broadleaf and fine leaf jam plus other species) each year that cost 10 cents each plus shipping and handling. Bob estimates that takes $500 per hectare to establish a direct seeded biodiverse Sandalwood plantation — 'that takes into account the seed and machinery costs, pest control, simazine if needed and a bit of fencing with second hand posts and five line station ringlock to keep the sheep out for a few years.

One thing that Bob has learned since branching into Sandalwood is that in drier years it can be difficult but doable if the planting on light land coincides with a rainfall event. i.e. watch for approaching 'fronts' and be ready to plant when a rain event comes in June or July!

Sprays:

- Simazine — 2 to 2.5litre/ha (but always ask the farmer what they use).

Critical success factors:

- Right site selection.
- Right soil type.
- Follow up rains at the right time is critical. Subsurface moisture is important as the surface can dry out quickly.
- Don't put the plantation in too late.
- Weed and vermin control essential.
- Protect young seedlings from wind/ sand blasting.

"THE ABILITY TO ACCESS KNOWLEDGE IS VERY IMPORTANT— WITH THE FLEXIBILITY TO ADAPT THAT KNOWLEDGE TO YOUR OWN SITUATION."

- Plant properly — use due diligence. Plant into moist soil and at the right depth. 2 to 3.5 centimetres for the host seed.
- Use fresh seed (hosts and Sandalwood).

"TREES CAN UTILISE RAINFALL AT ANY TIME OF YEAR."

BOB'S TIPS

- Check out and select the site, look for the right soil type in the right place.
- Talk to people such as the ASN peer mentors, local NRM people, people who have established plantations in your area. Be open to the good energy and fun in being part of this new industry. Most people love to talk about their trees. Listen to them.
- Get help = try to access a grant for seedlings and seed. 'I am grateful for the seedlings, seed, fencing materials and information and encouragement I have received from agencies such as the National Landcare program, Avon Catchment Council, AVONGRO, Wheatbelt NRM, the ASN, local NRM people, DEC, FPC, the Mount Marshall Shire. Too many people to mention them all. There is a big network of people, environmental workers, academics and researchers, CSIRO, nursery operators, who generously enjoy helping us cockies and landholders get a few trees growing back on our land.'
- Any plantation needs to work in with the farmers' production system.
- Benefit from the 'Edge Tree Effect' — try for a double row 2.5m apart with 8–12 m spacings between the double rows.
- In drier areas leave more space between the paired rows to harvest water.
- Remember to leave enough access to harvest the annual seed crop.
- Put into a paddock that has just been cropped as stubble gives protection for the young and germinating seedlings.
- Don't cultivate sandy soils prior to planting.
- Put in along a contour if possible.
- Put in a good mix of host species, even if putting in seedlings you can still put in some seed.
- Aim for 1,000 stems per hectare of hosts.
- Pest control is a must.
- **'Don't forget to let yourself enjoy the fun of establishing your plantation and building a sustainable industry for your farm and the wheatbelt. When wheat prices are down and chemical, fertiliser and fuel prices are up and it has forgotten how to rain — take a walk in your plantation with the dog, or your wife, if the dog wont come. The trees will cheer you up and put things in perspective.'**

- Use Peer Mentoring schemes — take advantage of all the experience that is around. Try to avoid reinventing the wheel. It is important to put your own identity on your planting but do your homework and listen to a variety of people.
- Use the resources and opportunities of the Australian Sandalwood Network, attend field days and support the network.

Bob is currently harvesting 1 to 1.5 tonnes per year of nuts which mainly go into other revegetation projects. He still harvests by hand with some local help but is looking at modifying an old air seeder or something similar to make a big vacuum cleaner to suck up the seeds. 'there are lots of people working on mechanical harvesting systems but I believe that it is important to keep as much of the mulch on the ground under the trees as possible'.

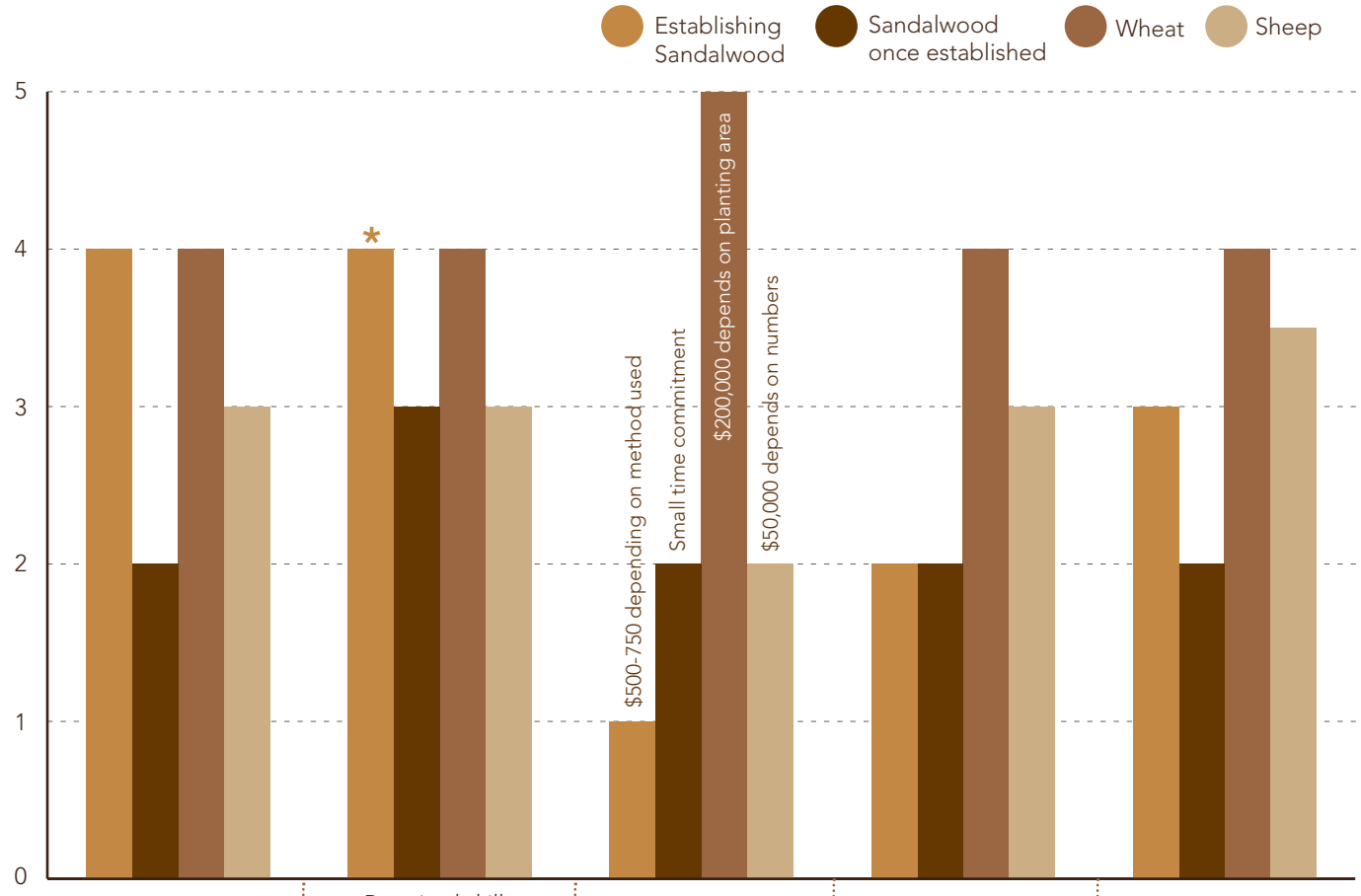
Perceived barriers to broader adoption:

- having to stop sheep from getting on the site for a few years
- perceived need to fence plantations
- weed control — however the Chatfield planter has a scalper that does a good job and keeps the furrow weed free for a couple of years.

Sandalwood (incense, temple carvings and other artifacts) has been part of spiritual pursuits for thousands of years and Bob feels they have a spiritual link, even exuding their own spirituality. For many years Bob preferred to get a contractor in to seed and harvest his wheat crop so he could concentrate on collecting and planting Sandalwood. Bob and those who work with Bob feel an enormous sense of peace and connectedness with the land when working with Sandalwood. 'there is a sense of the spiritual in all things, but particularly Sandalwood'.

Bob is a modest man who never forgets those who have helped, inspired and taught him along the way – 'getting little nudges along the way' resulting in now doing something that he enjoys.

RISK MANAGEMENT GRID



	Lifestyle	Required skills and knowledge	Start up costs	Market risk	Production risk
5	Very large time commitment	Very high level	$200,000	Very high risk	Very high risk
4	Large time commitment	High level	$150,000	High risk	High risk
3	Medium	Medium	$100,000	Medium	Medium
2	Small time commitment	Low level	$50,000	Low risk	Low risk
1	Very small time commitment	Very low level	$5,000	Very low risk	Very low risk

* Information is available — ability to access the skills and knowledge is very important.

Acknowledgements and references

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Interview with Bob Huxley April 2010

Photos courtesy of: Bob Huxley, Paul Hodges and Monica Durcan