

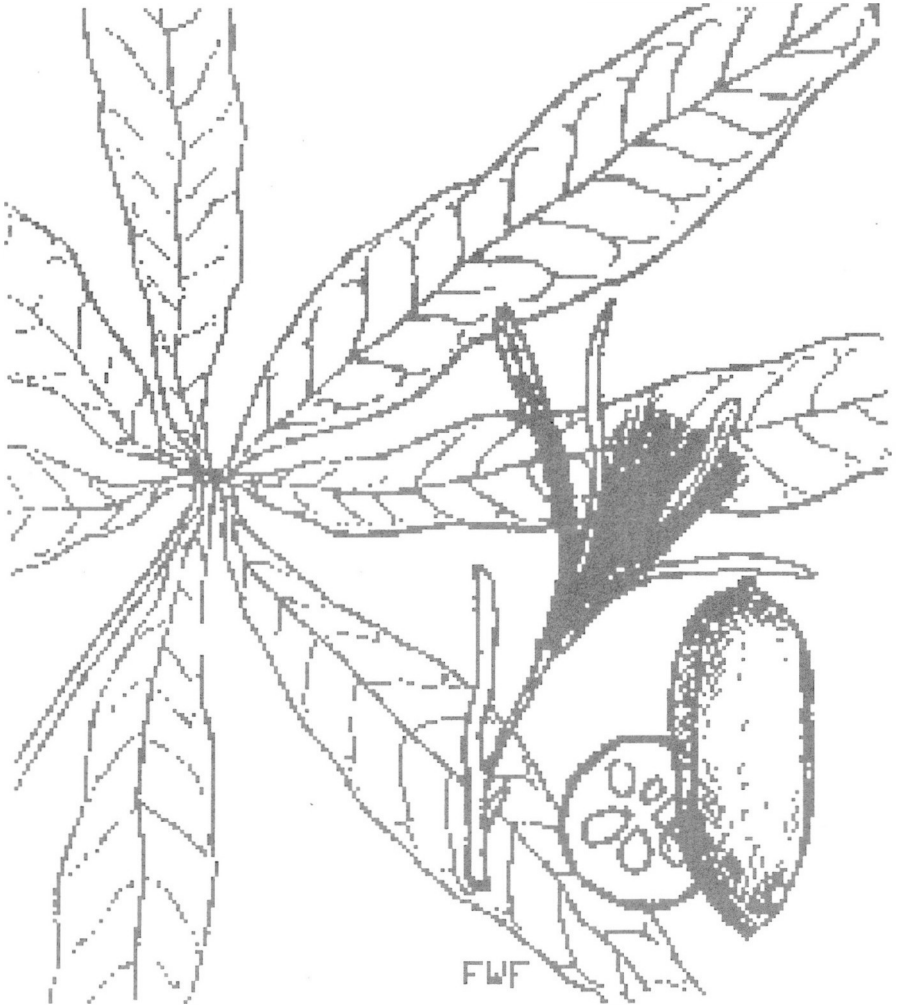


Quandong

magazine of the
West Australian Nut & Tree Crop Association (Inc)

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The Malabar Chestnut (*Pachira aquatica*) (See: About the Cover, p. 2)

Quandong • Second Quarter 1998 • Vol 24 No 2

NEXT MEETING: Tuesday May 19: 7.30 pm

Barry Shelton, President of the WA Palm & Cycad Society of WA, will talk on:

Palms in Perth with Edible Products

Here is an opportunity to hear one of WA's foremost palm experts.

PAULOWNIA FIELD DAY: Sunday May 31

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Full details on attached leaflet.

Visitors welcome. Queries to Tree Crops Centre, 9388 1965.

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About the Cover

The cover illustration shows the Saba Nut or Malabar Chestnut, *Pachira aquatica*, from a page on the Californian Rare Fruit Growers website (see article page 16). These trees are rare in Perth, but some trees are planted and growing well, and there may even be a commercial future for the nut.

Material appearing in Quandong is the views of the authors. It is offered in good faith, but neither WANATCA nor Quandong take any responsibility for any use of this material.

[WA Horticulture / 1998 Apr 2]

Mango flavour makes up for yield

Although well established at Carnarvon, mangoes are starting to make an impact in Gingin.

And while yields are nowhere as high as in traditional growing areas, mangoes grown 80 km north of Perth are holding their own on the market floor.

WA's biggest citrus operation, Westralian Fruits, entered the mango growing arena by chance, rather than planning, according to general manager John Marten.

"One of the farms we bought had mangoes on it, so we continued from there," he said. "That was in about 1992 and there were 1000 trees on the property, varying in age from about 10 years to 18.

"Today, after a three-year planting program, there are about 5000 trees on the property."

The mangoes take up just over 8.3 hectares of the 145 ha property. Citrus plantings account for 91.5 ha, avocados 33 ha, table grapes 1.6 ha and wine grapes just under 11 ha.

Kensington Pride is the common mango variety grown at Westralian Fruits.

Mr Marten said mango trees grew well at Gingin, although fruit yield was substantially down on what northern areas like Carnarvon,



John Marten with a whopping mango which weighs more than 1 kg and is still growing.

Broome and Kununurra achieved.

"It is not really the right climate here for mangoes — it is a little too cool for them," he said.

"Six to eight trays is about the average from our trees which would not please northern growers."

However, what lacked in yield was more than compensated for with flavour. Gingin mangoes were less fibrous than those from

Quandong Links to ATCROS

Many of the articles, advertisements, and news items in Quandong refer to organizations and people who are listed in the Directory section of the ATCROS Web Site, which is at:

<http://www.AOI.com.au/atcros>

In this issue, items underlined in the text have Atcros reference numbers listed at the end of an article or elsewhere close by. This is so that readers can get more contact details.

ATCROS usually lists name and phone numbers, also fax, e-mail, and web page details where available.

Quandong: Atcros ref. <A1466>.

elsewhere, and that made them tastier, said Mr Marten.

There was a lot of interest from fellow horticulturists in the progress of Westralian Fruits' mangoes but Mr Marten warned that the crop's viability needed to be assessed from the aspect of lowest returns.

He said in time returns would also be at the mercy of Carnarvon production schedules because research was developing later maturing varieties.

"This year we came in just a bit earlier than normal and noticed the marked difference in returns," Mr Marten said. "There were still a lot of Carnarvon mangoes for sale when we came onto the market which reduced our returns.

"Usually there is a two-week break between Carnarvon and when we start but not this season. "And just like with stonefruit, new varieties are extending the season in each region farther and gradually eroding people's niche markets."

The later production times in Gingin also made it difficult for Westralian Fruits to prevent the mangoes from suffering heat damage.

"Mangoes are very susceptible to the heat," Mr Marten said. "In the northern regions they are harvested by the time the really hot weather comes but we have to get ours through December, January and February — the hottest part of the year. "Anything that is exposed outside the tree canopy is susceptible to heat damage."

Mr Marten estimated that on average 5 per cent of the crop was lost to sunburn, although this season losses were minimal. Last year, Westralian Fruits, like most WA horticulturists, suffered serious losses because

of extreme 45°C temperatures recorded on three consecutive days. Frost was also a problem with their mangoes last year when the temperature fell to below 0°C nine times.

Mr Marten said if a grower planned to buy land at Gingin specifically to produce mangoes the likely returns would have to be calculated against the cost of the land before purchase.

Probable future prices of mangoes as more trees in the area became productive would also need to be considered.

Several horticulturists in the area have planted mango trees in the past few years and the biggest planting after Westralian Fruits is about 700 trees.

[Countryman / 1998 Apr 16]

Sandalwood, maritime pine urged for wheatbelt

Maritime pines are being planted further out into wheatbelt areas from Bolgart to Moora and Badgingarra to Lancelin, according to CALM pine sharefarming section officer Owen Donovan.

Mr Donovan said mills wanted more timber and needed more land to plant pines.

"I have not yet found a site too poor to plant pines on," he said.

Manager of CALM's business unit, Peter Jones, said farmers should also consider sandalwood, which is WA's longest running export industry.

"Elsewhere in the world sandalwood is diminishing because they have overexploited their own resources," he said.

"The demand for oil is increasing and pharmaceutical and perfume companies are very interested in it."

[*American Chestnut Cooperators Foundation website*]

The Genus *Castanea*

This genus includes also European and Asian chestnuts as well as Asian and American chinkapins. (Leaf tracings are available on the website)

American chestnut (*Castanea dentata*)

Tallest of the chestnuts with nuts smaller and sweeter than other chestnuts, but not as sweet as the Allegheny chinkapin, the American chestnut was highly valued as a timber tree and a dependable source of nuts for wildlife. It is identified by the leaves which are smooth and waxy on the underside, with deeply sculpted intervals along the edges, accentuating the teeth (therefore the designation, *dentata*). The base of the leaf tapers sharply, and its point is an elongated sharp taper. Hybrids of other chestnut species with American tend to have leaves that resemble the American parent, and can only be distinguished by microscopic examination of leaf hairs by an expert. For identification purposes, 10 leaf samples should be collected, including some immature leaves, some growing in the sun, and some shade leaves. American chestnut burs usually contain three nuts each.

Chinese chestnut (*Castanea mollissima*)

More resistant than any other chestnut species to the blight fungus, its nuts are sweeter and finer textured than those of the Japanese chestnut, and they are usually larger than those of the American chestnut. The chestnuts most commonly found for sale in country stores are Chinese. Most Chinese chestnuts do not have good timber form; their shape resembles an apple tree. Their leaves are quite variable. Compared to American leaves, those of Chinese chestnut are more oval shaped, with the tips abruptly tapered and the base more rounded; the intervals along the edges between the teeth are not remarkable, and the underside of leaves are covered with downy

hairs, soft to the touch (therefore the designation, *mollissima*). The Chinese chestnut is the hardiest of Asian chestnuts, with a natural range extending from south China to north of Beijing. In the southern part of its range, it is found at higher elevations; in the northern range, it thrives only on the better sites, particularly lower mountain slopes where it has some protection, good air drainage, good soil and the advantage of underground water from the slopes above. There are many

Get ready for the Bring & Buy

*WANATCA will be holding a
Bring & Buy meeting in September
at the Shenton Park Hotel carpark,
opposite the Tree Crops Centre.*

The date is Sunday, September
6, 10 am - 1 pm. There will be
more details in the next issue of

Quandong, but:

Make a start NOW

on potting up or producing your extra
nut, fruit, or other tree crop plants which
you can make available.

This is the opportunity to make some
money and at the same time raise the
number of crop trees planted locally.
Commercial sales are welcome too.

*Queries to Tree Crops Centre,
08-9388 1965.*

different varieties of Chinese chestnuts, and their hardness varies. Generally they grow vigorously on good sites in the United States and are seldom injured by blight. However, owing to a poor site, drought, or winter injury, they are sometimes severely attacked and killed by blight.

European chestnut (*Castanea sativa*)

Nearly as tall as the American, the European chestnut has a similar growth habit, tall and straight in the forest, spreading in open settings. It is slightly less blight-susceptible than American. Its nuts are about the same size as Chinese, but sweeter.

Its leaves are quite variable, at a glance, easily confused with American hybrids.

Japanese chestnut (*Castanea crenata*)

The Japanese chestnut grows wild in the mountains and hills of Japan. Not as tall as the American, its nuts range in size from that of the American to that of the European chestnut. Usually the nuts are large, coarse in texture and poor in flavour. The leaves are quite variable. Compared to the American, the Japanese chestnut leaf has a similar long sharp tapering tip, but a blunt base; its teeth are very small and poorly defined.

Henry chinkapin (*Castanea henryi*)

Native in middle China from the coast to the far west, the Henry chinkapin grows 75 to 90 feet tall with a straight, symmetrical trunk. In the United States, the Henry chinkapin seems to be more susceptible than the other Asiatic species to freezing temperatures and the blight fungus.

Ozark chinkapin (*Castanea ozarkensis*)

Native to the Ozarks, this tree grows up to 60 feet tall. It is susceptible to blight. Leaves are very similar to American chestnut, the same shape and deeply toothed. The distinguishing sparse hairs on the underside

of leaves may not be visible to the naked eye. The bur is slightly larger than Allegheny chinkapin and holds a single small plump nut.

Seguin chestnut (*Castanea seguinii*)

Usually no taller than 30 feet, the Seguin chestnut grows in the warm climate of southern China. Nuts of the Seguin are very small. In the United States this species grows well only in the Southeast.

Allegheny chinkapin (*Castanea pumila*)

This small tree or spreading shrub grows in dry woods in the east from New Jersey and Pennsylvania south to Florida and Texas. It is susceptible to blight. The leaves resemble American chestnut in shape but are very much smaller and downy on the underside. One inch burs each hold one tiny, very sweet, plump nut.

American Chestnut Cooperators Foundation:
<A3064>

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Lorna Budd to retire

WANATCA's Secretary-Treasurer, Lorna Budd, has indicated that she wishes to give up the position by the end of 1998.

After 18 years in the job, and having turned in a magnificent record of service, Lorna feels it is time to reduce her commitments. All members of the Association will want to join with the Executive in thanking Lorna for her unstinting and efficient efforts over the years, always tempered with good humour and cheerfulness.

Restructuring WANATCA

The Association's administrative officers are appointed by the Executive, rather than being elected. Lorna's filling of a variety of tasks for WANATCA will be a hard act to follow — she has become virtually irreplaceable.

The main areas where Lorna has served are as follows:

1. Taking minutes at Executive Committee meetings and at General Meetings;
2. Assembling and posting our printed publications quarterly;
3. Keeping records of membership payments;
4. Paying accounts for services and goods, and banking payments received;
5. Writing letters on behalf of the Association and the Executive.

These areas have been supplemented by

services provided by the Tree Crops Centre, which has acted as an informal Secretariat for the Association, particularly where computer services are concerned. These services include:

6. Acting as a first reference point for queries about particular crops or plants or techniques, from members and from the general public;
7. Sending out WANATCA Information Kits to prospective members and other enquirers;
8. Maintaining membership lists and records of payments on computer;
9. Preparing mailslips to use in mailing publications, and mailing publications to overseas members;
10. Accepting mail, personal, phone, and e-mail applications from new members, and sending out initial batches of publications outside the quarterly cycles;
11. Paying routine and urgent costs on the Association's behalf;
12. Processing payments in overseas

Olive Conference, Margaret River

May 15-16, 1998

Contact :

**Margaret River Business
Enterprise Centre <A2887>**

33 Tunbridge St, Margaret River WA
6285

Phone: 08-9757 9070

Fax: 08-9757 3598

E-mail: mrbec@netserv.net.au

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currencies, and payments made on credit, debit, and charge cards.

The Tree Crops Centre is also active in a range of activities concerning editing, typesetting, and arranging printing of WANATCA publications, but these are not under consideration here.

Can you help?

The Executive recognizes that these present and future jobs don't necessarily have to be allocated as they are now, and in fact the Association might benefit from breaking them up among a number of people, so that no-one has too great a load.

We would welcome offers from members and non-members who might be able to take on any of these tasks, especially Lorna's 1,2, and 5, and the Tree Crops Centre's 8 and 9.

Trevor Best has volunteered to take on 3 and 4, acting as Treasurer, and will also offer financial advice and direction.

If you or anyone you know might be interested in taking on one of these areas, they should contact David Noël in the first instance, on 9388 1965.

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[Countryman / 1998 Mar 26]

Pistachio planting on trial

Farming 2000 committee chairman Mac Hewlett is a strong advocate of looking at alternative farm enterprises, having trialled pistachio nut production in Dandaragan for the past three years.

Mr Hewlett and his wife, Fay, manage a wheat-cereal property in the district and became interested in the exotic nut after US grower Mike Woolf visited their property in the early 1990s.

It took Mr Woolf, who grows about 405 hectares of pistachios in California, three years to convince the Hewletts to trial the crop.

In 1995 they planted 1.6 ha of the hardy pistachio rootstock Pioneer Gold (sourced in Mildura, Victoria) and budded it with an Australian cultivar, Sirora, which is used widely in the eastern States.

From the 600 trees, about 100 budded successfully in the first year and 96 in the second year.

But Mr Hewlett said the trees would not bear fruit for six or seven years, so until about 2001-02 they would not know if pistachios would be successful in the area or not.

"But Mike is positive about getting nuts here," he said.

Although the Hewletts' property is in a 600 mm average rainfall zone, the pistachios require irrigation and like a chill factor.

Mr Hewlett said pistachio nuts originated in central Asia before being introduced to the Mediterranean.

"In Iran there are pistachio trees that are hundreds of years old still producing nuts," he said.



Mac and Fay Hewlett with their trial plantings of pistachio nuts planted in 1995

As far as he knew there were limited commercial plantings of pistachios in WA.

Some trials were being done in Williams, Northam and Bruce Rock and Mr Woolf believed they were highly suited to the Wheatbelt.

He planted his trees in an irrigated, sandy soil, free draining and non-waterlogged environment. They are expected to grow to a height of about 5 m when the nuts will be mechanically harvested.

The trees are fenced and it cost about \$3800/ha to establish his small plot, excluding water of which he has a good supply.

“We got Mike to do the budding because he was the expert and we did some pruning and slashing,” Mr Hewlett said.

“But we may have to re-bud the trees every year for the first three years to get them established.”

Mr Hewlett said there was a big market for

the pistachio in the Middle East, where it was regarded as a delicacy.

He said the 1.8 million kilograms of nuts produced on 20,200 ha in California annually were picked, graded, dried and salted.

Moisture content needed to be less than 12 per cent to prevent fungus growth.

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Jojoba moving to a solid crop

Jojoba, the dryland plant producing a unique liquid wax with properties close to that of oil once derived from sperm whales, has gone through times of boom and bust, but is now taking its place as a solid crop with sound economic characteristics.

Fifteen years ago, jojoba was promoted as a get-rich-quick crop in Australia, and many hopeful investors lost a packet in schemes organized by people lacking in experience and expertise in crop production, and probably in moral scruples too. However, after the fall there has been a steady and sound increase in agronomic and economic knowledge of jojoba in Australia, with development of new local varieties and techniques.

Botanically *Simmondsia chinensis* (the species name a misnomer, as it originates in the Sonoran Desert of California and Mexico rather than China), the plant appears well suited to large areas of WA's wheatbelt and adjacent areas. The jojoba nuts or beans are crushed to produce an 'oil' valued for cosmetics and special industrial tasks. Although edible, the oil has no food value at all, and has been recommended for slimmers in the past!



Alan Ness with his award-winning NiceNess jojoba harvester at Wagin Woolorama

[Countryman / 1998 Mar 12]

Wagin inventor does it again

A giant purple vacuum cleaner has given Wagin inventor Alan Ness his third win this decade at Woolorama.

The NiceNess Jojoba harvester was voted the best new invention at Woolorama much to the delight of Mr Ness, who won the same award in 1990 and 1993.

The \$10,000 machine is believed to be the world's first jojoba seed collector to use a vacuum system.

It collects the fallen seed from the ground by brushing it into the path of a 1 m-wide vacuum device. Once inside the NiceNess, it is separated from the dirt and stored ready to be pressed.

The machine also has the capacity to shake stubborn seeds free by blasting the trees with air.

"Jojoba seed is still harvested using a rake and shovel in many parts of the world," said Mr Ness. "That is the only way to get the seed off the ground."

Mr Ness said while holidaying in Carnarvon, a region known for its jojoba, he started thinking about how it could be harvested.

Following the success of his tagasaste harvester for which he won the same award in 1993, he was approached to build a machine for jojoba.

A deal with tree supplier Greg Ball and an engineering consultant saw the NiceNess become a reality and it will be displayed in NSW this week.

Powered by a 20 hp engine, Mr Ness said there had been plenty of interest in the machine and one order had already been placed.

"I am really delighted to win this award for the third time," he said.

"I have been building and inventing machines all my life and have built about nine or 10 machines since I retired 13 years ago. It is really a hobby."

Jojoba is a perennial plant suited to Wheatbelt conditions but which responds to irrigation. Seed is produced each year from year four and is pressed to extract jojoba oil.

— *Sue Peacock*

[Branching Out: Revegetation Newsletter Issue 4]

Jojoba - Not a laughing matter

There has been a resurgence of interest in growing Jojoba (*Simmondsia chinensis*) for

Changes on the Executive

WANATCA Exec member Brian O'Donohue has resigned. Many thanks, Brian, for your sage advice and comments over the years, and for your continuing interest in the Association.

To fill this and another vacancy on the Exec, two more members have been co-opted (ie, shanghai'd). Both are members of long standing who will already be well known to many.

They are: **Charles Peaty**, founder of Men of The Trees in WA, and a still very active forester. Charles brings a wealth of experience in timber production and planting, including in arid lands, and :

Wayne Geddes, until recently a principal of Roberts & Beck, the Metro Markets specialists in nuts and dried fruits. Wayne was a director of the old WA Nut Supplies Co-operative founded by WANATCA and has extensive knowledge of the local nut trade.

its unique 'oil'.

Exaggerated claims of the returns from Jojoba encouraged speculative planting in the 1980s, but costs of production and demand for the product meant that few businesses survived this period. Revived interest is based on better establishment and management technology, growth in the pharmaceutical and cosmetics markets, and potential for specialist technical uses.

Although the world market is currently small, most sales are to high value markets. Total world consumption of Jojoba oil was estimated to be only 560 tonnes in 1989 (814,000 litres) and somewhere between 1000

and 1500 tonnes now.

Average price for the basic oil is about \$25 per kg, but values of up to about \$95 per kg depending on the market and quality. Farmgate price for seed ranges between \$4500 and \$5000 per tonne.

The Australian domestic market is only about 6.5 tonnes of oil a year. However, there is a small export of higher quality oil from Australia. Australian production was estimated to be about 4.4 tonnes of seed and 2.1 tonnes of oil in 1991.

Average production has been less than 200 kg per hectare per year in Australia, but newer plantings may achieve over 1000 kg per hectare per year at maturity. Research and development is continuing.

Current market limitations are that the domestic market is small and that demand is based on high value, low volume cosmetics.

There is some optimism by current growers and researchers that jojoba oil could rapidly expand as a cosmetic ingredient, and markedly expand the market.

A paper at the March 1996 Saline Lands Conference reported that the potential market was 200,000 tonnes a year (remember that current world production is about 1000 tonnes).

To move into the high volume industrial oil and lubricant markets, the price per kg would have to fall markedly.

Jojoba is reported to have a degree of salt tolerance, and has been irrigated with brackish water in other countries. Some research is occurring in Australia.

In summary, the prospects look good, although there needs to be a lot of market development done before the industry has a secure, large scale future.

References:

- A report on jojoba oil. By Karen Purdy, Department of State Development WA, June 1991.
- Jojoba, Blue Mallee & Broombush: Market assessment and outlook. By Lisa McKelvie, Joanne Bills, Alistair Peat. Prepared for the Murray-Darling Basin Commission. ABARE Research Report 94.9. 1994.
- Jojoba for saline land? by RL Dunstone and G Ball. In Productive Use and Rehabilitation of Saline Lands. Conference Proceedings of the 4th National Conference and Workshop. Albany Western Australia, 25-30 March 1996. PROMACO Conventions Pty Ltd, Perth WA.

Contacts:

- Peter Milthorpe, NSW Agriculture, Condobolin NSW 2010. Phone (068) 952 099 (Research and extension material).
- Greg Ball, Fernihurst Wagin. Phone (098) 611 360 (Grower, nurseryman, information).
- *David Bicknell* (Revegetation Development Officer, Trees in Agriculture Group, Agriculture WA, Narrogin)

[Sourced from the web at: www.agric.wa.gov.au/progserv/natural/trees]

[A list of Jojoba publications is available from Granny Smith's Bookshop]

Trees in Agriculture Group: <A2888>

Greg Ball: <A3044>

Granny Smith's Bookshop: <A1221>

Australian Jojoba Industry Association: <A3185>

Jojoba at a glance

Jojoba can be grown in southern Australia in medium to low rainfall areas and has promising commercial prospects.

Jojoba is well adapted to the subtropical regions of Australia. Plant selection and management research has increased potential yields to the stage that profitable production is possible in more temperate regions. Production, marketing and the industry in Australia needs further developing.

The Plant

- Jojoba (*Simmondsia chinensis*) is an evergreen shrub native to the Sonora desert in America.

- It is drought resistant, can extract water from deep in the soil profile, prefers free draining sites.

- Susceptible to waterlogging, frost and low pH.

- Dioecious ie male and female flowers are produced on separate plants and are wind pollinated.

- The fruit contains 50% liquid wax, a unique, valuable long chain wax ester highly valued for cosmetics, pharmaceuticals, lubricants and surfactants. Jojoba meal is 30% protein.

- The fruit and its products are very stable and are unlikely to go rancid or be attacked by pests.

Industry development

- Plantations established in the 1980's were often in unsuitable areas, with unselected seed and poorly managed, most failed to produce economic returns and are now abandoned.

- Those established in the Carnarvon region now provide most of Australia's commercial production.

- Recent work has focused on selecting cultivars and developing agronomic systems for temperate regions of Australia.

Costs and production figures

- Approximate costs in temperate Australia (1995 prices): Plants \$3750/ha, ground preparation \$150/ha, planting \$200/ha, mechanical weed control, herbicide and fertiliser \$700/ha over the first three years.

- On-going maintenance and harvesting costs are \$300/ha/yr.

- One hectare can produce between 1 and 2 tonnes of seed depending on age and irrigation, which in 1996 was valued at \$4,500/tonne.

- The estimated potential world market for jojoba oil

is between 64 000 and 200 000 tonnes/yr.

- As jojoba production increases, prices to the farmer will fall.

- Genetic engineering of canola to produce long chain wax esters, could change the above scenario.

Site selection and irrigation

- Jojoba is most suited to summer rainfall areas.

- Loose sandy surfaces make harvesting difficult.

- Can be grown in areas receiving over 250 mm rainfall. Produces regularly on 420 mm of rainfall.

- Once established the timing of rainfall or irrigation is not critical, as jojoba will exploit moisture held in the soil.

- Can tolerate irrigation with brackish water (up to 800 mS/m) and effluent water, however increasing salinity levels will reduce vigour and production.

Establishment and planting design

- Weed control should begin one or two years before establishment.

- Plant in spring (when soil temperatures reach 20°C) or late summer.

- Water in after planting. Trickle irrigation in the first three years is common practice.

- Plant jojoba in rows for ease of harvesting.

- Mechanical harvesting bares the soil, the whole area needs protection from the wind.

Harvesting and Processing

- Harvest begins in the 3rd or 4th year after establishment, peak production is reached by year 12.

- The fruit can lie on the ground for months before harvesting provided it does not become wet.

- Harvesting machines have been developed by local growers, some equipment will be operated by contractors.

Research needs

- Weed control, nutrition, varietal selection and harvesting equipment.

Australian Jojoba Industry Association

- Aims to promote the production of jojoba, foster research and assist in the development of orderly marketing of the product.

— Avril Baxter

Tree seed available from Chile

The following information has been kindly supplied by WANATCA member Daniel Vera of CESAF, Chile.

CESAF-Chile, Centro de Semillas de Arboles Forestales (Forest Tree Seed Center), is part of the Forestry Department, School of Forest Sciences, University of Chile. Our main objective is to provide seeds of quality to the productive forest sector. We maintain a wide seed stock of native and exotic species, with forest and ornamental uses, trees and shrubs.

Each marketed seed lot contain technical information necessary for its propagation, as well as laboratory data that certify its biological characteristics, to aid in planning seasonal nursery activities. The use of high quality seeds is a fundamental factor in the process of propagation, increasing the benefits and diminishing the associated costs of plants production.

NATIVES

Scientific name	Common name	US\$/Lb	Nº Seed/Lb	P	CG	Availability
Acacia caven	Espino	16	3.484	98	89	I
Austrocedrus chilensis	Ciprés cordillera	140	116.500	86	56	I
Caesalpinea spinosa	Tara	25	7.013	98	96	Feb
Cassia clossiana	Quebrach	32	13.599	95	89	Aug
Citronella mucronata	Naranjillo	16	1.261	98	50	May
Colliguaja odorifera	Colliguay	54	5.026	98	73	Dec
Cordia decandra	Carbonillo	16	558	98	77	I
Cryptocarya alba	Peumo	5	195	98	98	Mar
Drymis winteri	Canelo	82	116.323	87	54	Mar
Embothrium coccineum	Notro	60	33.466	87	80	Mar
Eucryphia cordifolia	Ulmo	486	344.728	78	83	May
Gevuina avellana	Avellano	5	50	99	73	Apr
Jubaea chilensis	Palma chilena	6	59	99	89	I
Lapageria rosea	Copihue	56	15.195	96	88	May
Lithrea caustica	Litre	23	10.115	94	88	Mar
Maytenus boaria	Maitén	37	24.630	97	74	Mar
Nothofagus alpina	Raulí	92	39.871	92	78	I
Nothofagus dombeyi	Coihüe	70	301.864	75	30	I
Nothofagus glauca	Hualo	49	562	988	87	I
Nothofagus leonii	Huala	84	1.061	98	78	I
Nothofagus obliqua	Roble	52	39.734	97	87	I
Peumus boldus	Boldo	49	4.976	98	56	Jan
Podocarpus saligna	Mañío hojas largas	60	8.006	78	61	Mar
Porlieria chilensis	Guayacán	61	5.588	94	67	I
Prosopis chilensis	Algarrobo	49	14.456	97	98	Mar
Quillaja saponaria	Quillay	50	57.633	87	78	I
Schinus molle	Pimiento	13	12.737	95	87	I
Sophora macrocarpa	Mayo	25	975	98	95	I
Sophora microphylla	Pelú	46	4.740	98	90	I
Weinmannia trichosperma	Tineo	432	6.609.078	50	45	Apr

EXOTICS

<i>Scientific name</i>	<i>English name</i>	<i>US\$/Lbb</i>	<i>N° seed/Lb P</i>	<i>CG</i>	<i>Availability</i>
<i>Acacia capensis</i>	Acacia	27	8.727	99	89
<i>Acacia dealbata</i>	Silver Wattle	28	35.788	98	89
<i>Acacia melanoxylon</i>	BlackWood	38	25.809	97	88
<i>Albizia lophanta</i>	Albizzia	22	6.668	98	78 Mar
<i>Araucaria angustifolia</i>	Monkey Puzzle	22	70	99	90 Feb
<i>Brachychiton populneum</i>	Kurrajong	18	3.484	98	78 Mar
<i>Casuarina cunninghamiana</i>	Bullock	49	7.888.792	93	81 Feb
<i>Casuarina stricta</i>	Bullock	49	113.670	91	88 Dec
<i>Catalpa bignonioides</i>	Indian Bean	19	24.294	92	92
<i>Ceratonia siliqua</i>	Carob	38	3.987	98	88
<i>Cercis siliquastrum</i>	Judas Tree	22	15.649	98	67
<i>Crataegus oxiacantha</i>	Hawthorn	5	2.214	78	57
<i>Eucalyptus globulus</i>	Blue Gum	49	113.398	96	91
<i>Ginkgo biloba</i>	Maidenhair Tree	32	196	99	81 Oct
<i>Gleditsia triacanthos</i>	Honey Locust	19	2.254	98	87
<i>Grevillea robusta</i>	Silkoak	50	36.650	81	89 Mar
<i>Jacaranda mimosaeifolia</i>	Jacaranda	49	46.947	87	73 Jan
<i>Liquidambar styraciflua</i>	Sweet Gum	60	65.771	85	73 May
<i>Lupinus arboreus</i>	Lupine	9	5.597	98	98
<i>Parkinsonia aculeata</i>	Jerusalem Thorn	38	4.831	98	83
<i>Phoenix canariensis</i>	Canary Palm	16	448	99	78
<i>Pinus radiata</i>	Monterrey Pine	17	12.476	97	87
<i>Pseudotsuga menziesii</i>	Pino Oregón	130	60.166	95	59
<i>Robinia pseudoacacia</i>	Locust Tree	37	21.092	96	78

(*) Values of germination, purity and number of seeds per pound are averages

of all lots. US\$/Lb = Price per pound of seeds in US dollars; N° seed/Lb = Number of seed per pound; P = Seed purity (%); CG = Germination capacity (%); I = Immediately

Additional costs: Phytosanitary Certificate, US\$ 15 (does not depend on the volume or number of species required); Freight (typically \$35 / pound to USA, Canada, \$45 / pound to Spain, England, depending on freight method chosen).

The minimum volume supplied is 1 pound per species. Inspect the seed immediately. We will accept returns no later than 7 days after receipt of seed. Claims for seed lost or damaged in transition should be made directly to the carrier.

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[California Rare Fruit Growers / Website]

The Malabar Chestnut

The following extract is from the first-class website of the California Rare Fruit Growers, as is the Cover Illustration of this issue of *Quandong*. The sketch on this page is based on one in the Royal Horticultural Society's *Dictionary of Gardening*. This plant appears to grow quite well in Perth.

Malabar Chestnut

Pachira aquatica (Bombacaceae)

Common Names: Malabar Chestnut, Guiana Chestnut, Guyana Chestnut, Provision tree, Saba Nut

Related Species: Mamorana Grande (*Pachira insignis*). (Listed as *Bombax glabra* in the Index of CRFG Publications, 1969-1989.)

Distant affinity: Baobob, (*Adansonia digitata*), Durian (*Durio zibethinus*), Almirajo (*Patinoa almirajo*), Chupa-chupa, South American Sapote (*Quararibea cordata*).

Origin: The Malabar chestnut is native to an area from southern Mexico to Guyana and northern Brazil.

Adaption: Tropical estuaries are the native habitat of the Malabar chestnut, so it is perhaps best suited to Hawaii and southern Florida. Even so, the plant also grows well in the milder parts of southern California. Several handsome specimens are thriving in the Quail Gardens collection near Encinitas, Calif., which has more cold and wind than many home gardens. The plant will tolerate brief exposure to temperatures

as low as 28° F, but may drop some or most of its leaves. Malabar chestnuts make attractive potted plants and add an attractive tropical note to patios and sun rooms.

DESCRIPTION

Growth Habit: The Malabar chestnut is a very showy evergreen tree with greenish bark that can grow to 60 ft. in the tropics. In California the growth is more like 10 to 15 ft. tall with a spread of 8 to 10 feet.

Foliage: The shiny, bright green, alternate palmately compound leaves of the Malabar chestnut grow to about 12 inches long and are quickly shed. They are larger and showier than *Chorisia speciosa*, the popular floss-silk tree. Young leaves and flowers are cooked and used as a vegetable.

Flowers: The petals of the very large creamy white flowers of the Malabar chestnut curl back to the base of the flower, leaving only the spectacular clusters of 3 to 4 inch cream-white stamens.

Fruit: The five-valved fruit of Malabar chestnut is an ovoid, woody green pod which may reach 4 to 12 inches in length and 2 to 2-1/2 inches in diameter, bearing some



Flower and leaves of *Pachira macrocarpa*

resemblance to kapok or silk floss seed pods. The tightly packed seeds (nuts) inside enlarge until the pod bursts and the seed fall to the ground. The rounded seeds are without floss and 1/2 inch or larger in diameter. They are edible raw or roasted.

CULTURE

Location: A frost-free location with some protection from hot, drying winds is the best choice for the plant. It will take full sun to partial shade. Overall, the tree is a handsome landscape addition.

Soils: Malabar chestnuts are not overly fussy about soil as long as it is well drained.

Irrigation: The Malabar chestnut needs consistent and regular watering, although logic would suggest that in California the plant should be kept on the dry side during the cold winter months.

Fertilization: Malabar chestnuts need only a light monthly fertilizing with a balanced, all-purpose fertilizer during the warm months.

Pruning: The Malabar chestnut seldom needs pruning.

Propagation: The tree may be propagated by seed and cuttings, and probably by air-layering.

Pests and diseases: The Malabar chestnut appears to be largely free of pests and diseases in California. Container specimens should be watched for usual house plant pests such as mealybugs.

Harvest: The nuts of the Malabar chestnut are harvested when the seed pods burst. The raw nuts taste like peanuts and will keep for months in a cool, dry place. Roasted or fried in oil they have the flavor of chestnuts, and can be ground into a flour for bread baking.

California Rare Fruit Growers: <A1115>
(www.crfg.org).

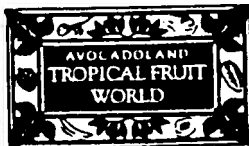
Conference on Quandong

The Australian Quandong Industry Association (AQIA) will be holding their 1998 Annual Conference at the Plant Research Institute, Waite Road, Netherby SA 5062, on July 11-12.

Topics to be discussed include grafting, irrigation, soils, marketing, cutting machines, and tissue culture, and there will be field trips. Everyone interested in quandongs is invited.

Further information: Elizabeth Gordon-Mills, 7 Lentara Court, Magill SA 5072, Tel. 08-8332 6451, fax 08-8333 2108.

AQIA: <A1645>



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[Countryman / 1998 Mar 26]

Vines thrive in heart of cropping country

John Brown always wanted to grow wine grapes, even though his Dandaragan sheep-cereal farm is many kilometres from the heart of WA's viticulture regions.

His dream became a reality in September 1994 with the planting of 5.6 hectares of Chenin Blanc vines, in a plot that will be more than doubled to 12 ha, supporting many varieties, in the next few years.

Mr Brown, whose father went from the Swan Valley to take up the Dandaragan property in 1919, runs the small vineyard with his wife Margaret and sons Richard, David and Gordon.

Richard Brown said his grandfather always likened their farm to the Swan Valley, a view supported by WA wine grape research pioneer Dr John Gladstones, who said Dandaragan had potential to be one of WA's better wine grape growing areas outside the Valley and Margaret River.

Dr Gladstones visited the Brown's property and selected the best site for the grapes. They were planted on the side of a hill with loam-over-clay soil based on coffee rock, leading down to a more sand-over-gravel structure.

Mr Brown said they wanted a site fairly typical of the rest of the farm to judge how well the grapes would go for wider-scale production.

He said the initial vine planting was followed by another 3.2 ha last year, and there was potential for up to 12 ha to be grown on the site.

The Browns are now growing Verdello, Chardonnay (white) and Touriga (red) varieties and plan to trial Shiraz this year.



John Brown looks over some Chardonnay vines planted this year on his Dandaragan farm, which is proving successful for wine grape production

They picked their first vintage of seven tonnes of grapes in February 1996, and the Chenin Blanc won a bronze medal at Perth Royal Show that year.

Last year's harvest was 55 t and the Chenin Blanc again received a bronze medal at the Royal Show.

In the first year 1800 bottles were produced under the family's Bidgerabbie Estate label. Last year this increased to 5000 bottles and this year the figure will double to 10,000. Most is sold from the farm.

The grapes are drip-irrigated with an eight-litre dripper per vine.

"Grape growing has good potential in this region and if we can continue to produce good tonnages of quality fruit it is worthwhile," Mr Brown said.

The Browns are also kept busy running 12,000-15,000 head of sheep and cropping 2200 ha

— *Melissa Vaisey*

Macadamia matters

Macadamia Action Group

Gidgegannup Nursery principal and macadamia enthusiast John Cory, of Shelterbelter Australia, has agreed to take over leadership of WANATCA's Macadamia Action Group from Wilf Prendergast.

Wilf is expecting to move to Narrogin in the near future, following a change in career direction. Many thanks for your efforts with macadamias (and pecans!) over the years, Wilf, and we know you will continue to support the Association in Narrogin with your usual enthusiasm.

Macadamia Field Day

John Cory has arranged a Macadamia Field Day at Gidgegannup on Sunday, May 17, 11 am - 2.30 pm.

Topics will include: an Industry Update, Growing Macadamias without Water, a Harvesting Demonstration, Demonstrations of Dehusking and Cracking, and reports on advances in Processing.

Cost of \$20 includes tea or coffee, bring a picnic lunch. Further details, ring 08-9574 6163.

Shelterbelter Australia: <A1505>

[Vetiverim: Quarterly Newsletter of the Pacific Rim Vetiver Network / 1998 Jan]

Growing mushrooms on vetiver

During discussions at the International Vetiver Workshop held in Fuzhou, Fujian, China on 21-26 October 1997, one of the issues raised was whether or not vetiver could generate profit.

Trials at various locations in China indicated that vetiver not only can be used to control soil erosion in order to maintain soil fertility and to increase crop yields of about 30 percent as pointed out in one of the papers presented, but also can be used as animal feed, as cottage roofing materials, and as material for handicrafts (samples of which have been exhibited at the Workshop), which could be sold directly in the market and can generate profit to the farmers

Another demonstration on the use of vetiver for profit generation took place at Fujian Agricultural University where edible mushrooms are grown on the substrate made from cut vetiver hay. These mushrooms used

to be grown on wood, the procedure of which creates an environmental hazard due to forest clearing. Not only is it possible to substitute wood with vetiver grass, but the yield obtained from vetiver (1 kg of mushroom from 1 kg of vetiver) is also 10 % higher than from wood.

Moreover, the production period in using vetiver is much shorter than that of using wood. Although mushrooms can also be produced from other grasses, but vetiver is more efficient and, since it can grow in almost any place where other grasses cannot, and is tolerant to cutting, it has gained confidence of the mushroom growers.

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[ABC TV program 'Landline' / 1998 Jan 4]

The Paulownia Tree

Paulownia is a deciduous hardwood native to China where it's treasured as much for its spectacular growth rate (up to five metres a year) as its exceptionally light, clear, white wood. Paulownia timber is between balsa and poplar and is used as an ornamental finishing and furniture timber.

Paulownias are sometimes known as Emerald Dragons, Kiri or Princess Trees though they may just as well be referred to as "nesteggs". The Chinese have traditionally grown Paulownia for their children's inheritance while in Japan it's prized for its use in musical instruments, ornamental and ceremonial furniture like glory boxes and shoes. Paulownia is also commonly used for chopsticks. In Australia there's not much

available just yet, but what there is has found its way into interior home trimmings, picture frames, coffee tables, cabinets and even coffins.

Paulownia requires much more intensive management than traditional plantation timbers like pine and eucalyptus - top quality well-drained soils, and plenty of good summer rains or irrigation. In return they're ready to woodchip in three to five years and be harvested as sawn logs in eight to ten compared with thirty to fifty years for other plantation timber types.

But the timber is only the tip of the iceberg. These trees store most of their nutrients in their plate-sized leaves making them an unusually rich source of nitrogen and phosphates.

The Chinese plant Paulownia far enough apart to enable the land in between to be used for crop production. As the leaves fall they are mulched into fertiliser. The leaves are also used as cattle fodder, though animals have to be kept away from the trunks themselves as the bark can easily be damaged.

(Reporter: Peter Lewis)

Contacts:

James Lawrence, RMB 6810 Balnarring Vic. Phone: 03 5983 5688

Laurie Capill, Qld DPI Forestry Division. Phone: 07 3234 0591

Queensland Paulownia Forests Limited. Phone: 1800 814 764. Plant Sales: 07 5525 3427

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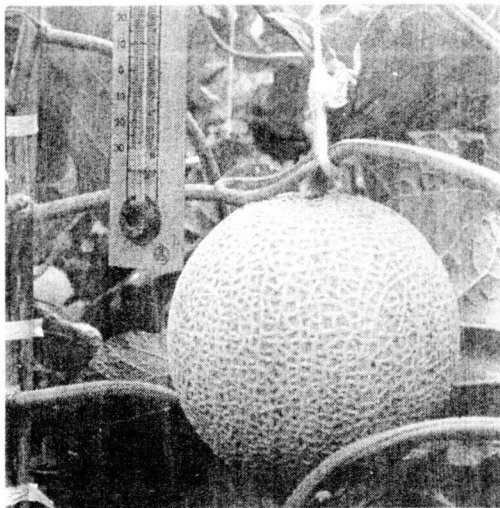
Stroke your melons for profits

The February 1998 issue of The Garden (Royal Horticultural Society, London) had a most interesting article, Improving on excellence, on melon growing in Japan, written by New Zealander Keith Hammett. It included an unusual growing technique:

Melons are grown all over Japan, but the highest quality musk melons come from an area to the south west of Tokyo. Here the Shizuokaken Greenhouse Agricultural Cooperative has four branches each with its own brand - Crown, Diamond, Queen and Fuji.

There are 1,396 farms which have more than 500 hectares of glass. They produce more than 17,500 tonnes of fruit each year.

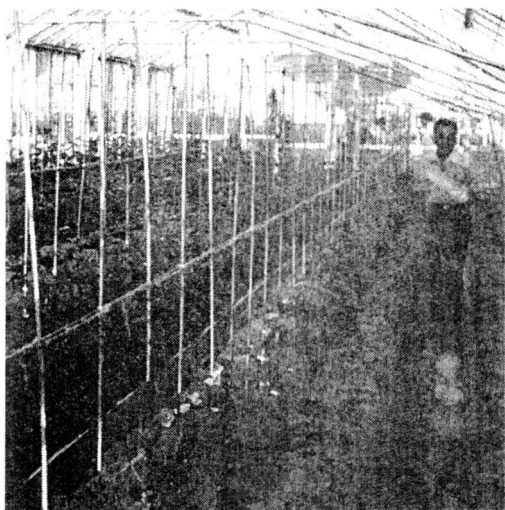
By manipulation of sowing and planting dates, fruit can be harvested for 11 months of the year. The melons are grown in greenhouses (above) with controlled humidity and temperatures: 30°C during the day and 22°C at night - there is only one month a year when artificial heat is not needed. They are watered two or three times a day.



Over the years, growing protocols have been developed and refined so that all stages of plant and fruit growth can be scheduled to the day. Great attention is paid to the number of leaves above and below the fruit and to total leaf area. Flowers at specific nodes are pollinated on preordained days.

When the fruit reaches a critical stage, cracks appear over the surface. These heal with corky tissue which ultimately forms the highly desired surface netting, or reticulation. The cracking is controlled by reducing the water available to the plant for a few days.

Once past the critical period of net formation, its development is enhanced by caressing each fruit at regular intervals with gloves which are impregnated with a growth substance.



[Institute for Tropical & Subtropical Crops (South Africa) / Biennial Report, 1995-97]

Papaya breeding in South Africa

The Papaya Breeding programme was restarted in 1993 with about 40 Hortus Gold related strains, collected from different South African producers. Generous financial support is received from Safmarine Ltd and from the Industrial Development Corporation.

In order to ensure a rich gene pool, foreign germplasm was secured from various overseas sources such as Taiwan and Brazil. New generations of improved material are produced by controlled pollination, mostly sib-pollinations, of plants selected for superior characteristics.

Outstanding strains are currently available. Marketing of commercial seed will commence during 1997.

Breeding activities have been expanded to support a fledgling export industry. Sunrise Soto selections, and crosses and backcrosses between Sunrise Solo and Hortus Gold types, are being used for this work.

Tissue culture of papaya

In order to ensure that selected genotypes will be retained for establishment of commercial orchards the Division of Biotechnology successfully developed a protocol for the micropropagation of papaya plants. They managed to produce large numbers of plantlets at very economic cost. It is believed that



A good example of the new 'Papino' selection

establishment of plantations by seed will become increasingly outmoded.

Institute for Tropical & Subtropical Crops:
<A1289 >

Yatay Palm fruiting in Shenton Park

Ros and Ray Hart report that this year they have had quite a few fruit on their Yatay Palm.

This palm, botanically *Butia yatay*, is a native of South America. Their tree is now 12 years old, and its parent is believed to be a plant in Perth's Kings Park.

Ros describes the fruit as 'very good'.

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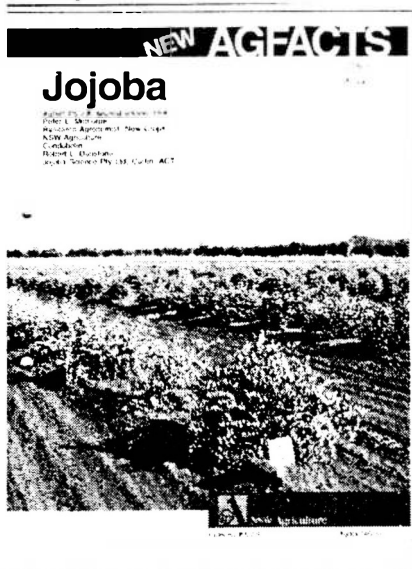
BOOK REVIEWS

by David Noël

JOJOBA. Peter Milthorpe . Published by NSW Agriculture, 1996. 20p. Pb. *\$8.00.

This new all-colour brochure from NSW Agriculture provides an excellent introduction into this crop, highly suited to broad-acre farmers in drier areas.

This crop has in a sense 'come back from the dead', as it was the subject of over-promotion during the 1980s. It is now back on good commercial road, due largely to research and development work done in Australia.

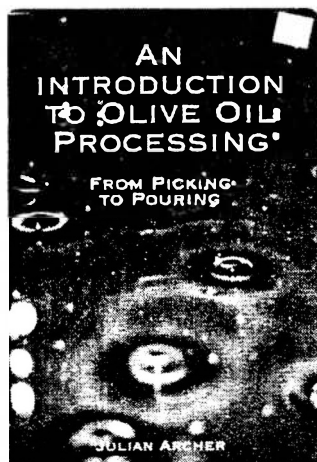


An emphasis of the brochure is the potential of jojoba as a perennial-plant crop which will flourish in lower rainfall areas, produce reliable yields of an economically attractive and readily marketable product, be adaptable to mechanized farming practices, and at the same time offer the land-protection and environmental benefits of conventional tree plantings.

Aspects covered in the brochure include: establishing a plantation, harvesting, irrigation, water management, marketing and economics.

This should be the first reference taken up by people considering jojoba growing.

An Introduction to OLIVE OIL PROCESSING: from picking to pouring. Julian Archer . Published by Olives Australia, 1997. 59p. Paperback. *\$14.95.



The olive industry in Australia is developing at a cracking pace, due both to local investment and to local research and development.

A large amount of information is now available on this crop, but it needs continuing updating to match the changes. A major influence for change has been the development of new, small, largely automatic olive oil processing machines at a price which can be afforded by a small boutique olive oil producer, ranging from around \$15,000.

This beautifully produced new Australian book describes the range of machines, from the small single-operator continuous-flow machines up to the conventional central factory

approaches.

Olives Australia have played a major role in Australian olive industry development, through both their own research and through a wonderful range of information services, including a comprehensive website. This book is a valuable addition to the range at a remarkably low price.

WALNUT Production MANUAL.

Published by the University of California, 1998. 320pages. Paperback. *\$64.95.

There has been no comprehensive manual on walnut production since *Walnut Orchard Management*, originating from the same publisher, went out of print many years ago.

So it is a pleasure to report the availability of this updated version of the walnut book, from one of the world's major walnut growing regions.

This complete, definitive walnut work includes 34 chapters on every aspect of walnuts: species, culture, orchard establishment, soils, floral biology, rootstock characteristics, fertilizers, propagation, irrigation, pests, history, and much more.

Highly recommended, an essential purchase for anyone serious about walnuts.

*Prices at Granny Smith's Bookshop (see ad page 31).

Olives Australia: <A2771>.

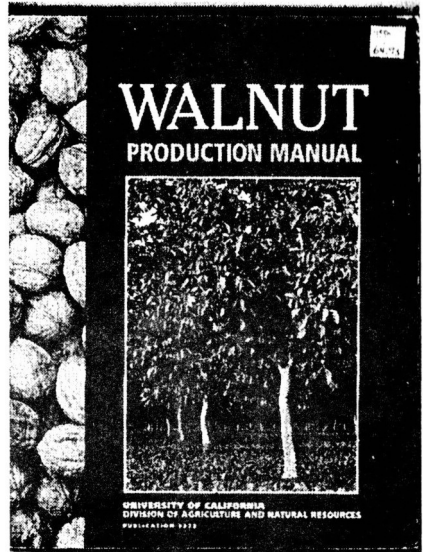
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Standard pecan varieties in California

Roger Meyer, who supplied the new pecan variety 'Navajo' for introduction into Western Australia, has given us the standard pecan variety list of the propagator, L.E. Cooke of Visalia, Ca. Here are the cultivars that they are offering this year and other information:

Name	Pollen Shedding	Shell	Other Info
Burkett	Late	Soft	
Cheyenne	Early	Soft	
Choctow	Late	Soft	Semi Self-Fertile
Desirable	Early	Med-soft	Semi
Mahan	Late	Soft	
Mohawk	Late	Soft	Semi
Navaho	Early	Soft	
Pawnee	Early	Soft	
Select	Early	Soft	
Success	Early	Med-soft	Semi
Western Schley	Early	Soft	Semi
Wichita	Late	Soft	

[Countryman / 1998 Feb 19]

Look to NZ, industry advised

Australia's emerging farm forestry industry should not attempt to reinvent the wheel but learn from New Zealand's 40-year-old industry.

Bruce Treeby, a member of the 4500-strong New Zealand Farm Forestry Association, said many NZ landowners made more annual income from trees than their other farm pursuits. The average association member had 42 hectares under trees, mostly *pinus radiata*.

Mr Treeby, the associate editor of the New Zealand Tree Grower magazine, recently toured South-West WA with his wife Ann.

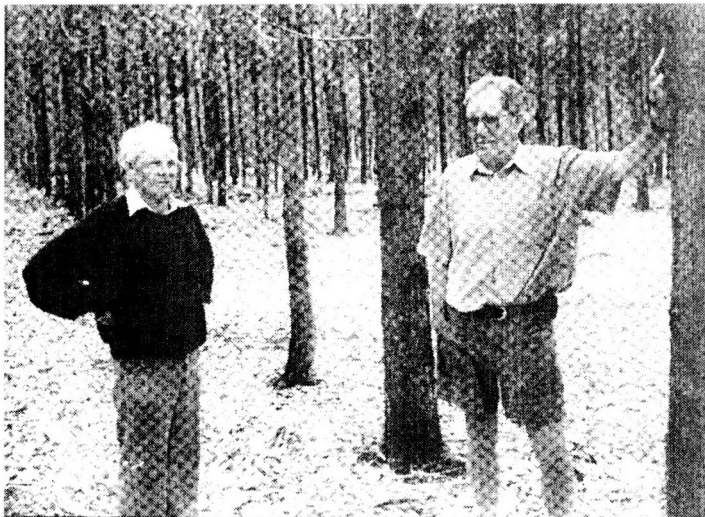
At Albany he was guest speaker at a function organised by Julia Levinson, the coordinator of Timber 2002. Mr Treeby said 80,000 ha a year were planted to trees in New Zealand, mostly by "small, independent growers". "Our Farm Forestry Association's motto is trees for pleasure and profit," he said.

"And those of you who have been to our annual conference will know we're a bit like a big family. "When the association started in the late 1950s most landowners wanted trees for soil conservation and protection of paddocks,

"Now many make more dollars from trees than their traditional agriculture."

While 80 per cent of plantations were pine, other species being grown for structural or specialty purposes included cypress (*Cupressus macrocarpa* and *Cupressus lusitanica*), Douglas fir, *Acacia melanoxylon* (being grown with varying degrees of success) and a range of eucalypts.

Mr Treeby said farm forestry in WA should not



Napier tree farmer David Mattinson with Bruce Treeby

become too diversified but focus on what grew best. He said bureaucrats and arms of governments should be kept out of farm forestry.

— *Richard Piggott*

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Countryman March 26, 1998

Australian trees save Pakistan saltland

Agriculture WA has completed a decade of research in Pakistan looking at forage shrub production and revegetation of the country's saltland using Australian shrubs.

Senior research officer Ed Barrett-Lennard said revegetation using saltbush shrubs and salt-tolerant trees had provided Pakistan with the means for productive agriculture on what was recently considered wasteland.

Dr Barrett-Lennard said saline paddocks had been trans. formed and nurseries had been established to propagate plants for the continued revegetation of saltland.

"Hopefully, this will contribute to the quality of life of the community which is acutely economically deprived because of salinity," Dr Barrett-Lennard said.

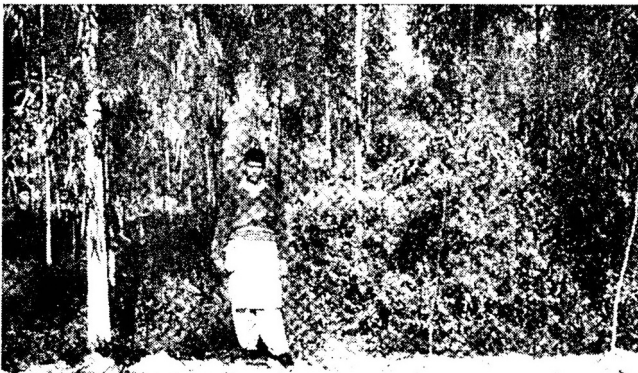
The research project was funded by the Australian Centre for International Agricultural Research (ACIAR) and complemented by a CSIRO-Pakistan team which examined the potential of Australian salt tolerant trees.

"Pakistan and Australia have a common enemy in salt. In each country, millions of hectares of previously productive land has been affected by salt or has the potential to become saline through inappropriate land management," Dr Barrett-Lennard said.

"The development of saline agricultural systems is economically important to both countries."

Dr Barrett-Lennard said Pakistan had a substantial salinity problem, with about 40 per cent of irrigated land in the south affected by salt and 25 per cent in northern Pakistan. More than six million hectares had become saline, affecting about 20 million people.

The major cause of salinity in Pakistan was over-irrigation and leakage from irrigation



Growth of a mixed stand of river red gums and saltbush species in a salt-affected farmer's field in Satiana, above: on establishment, and after 3.5 years

canals which raised the water table and drew salt to the surface.

He said the salt tolerant shrubs and trees had the benefit of lowering water-tables in salt-affected land and providing fodder and economic which were both in short supply in Pakistan.

"Nearly all salt-affected land is potentially productive. The challenge in Pakistan was to show that wasteland could be useful while still in its salt-affected condition," he said.

"Agriculture WA had to determine which plants survived best on salt-affected land maximise the productivity of those plants and determine their value as forages for animals.

The economic benefits of saltland revegetation for local communities was also assessed.

"In trials at six sites in Pakistan the species of Australian saltbush typically grown on saltland in Western Australia were found to be most tolerant to salt and waterlogging. Saltbush was also found to be a useful forage for mixing with other low quality feeds."

Dr Barrett-Lennard said the growth rate of saltbush and eucalypts planted on salt-affected land near the town of Satiana was astounding. After just 3.5 years, the trees had reached more than 10 m.

Another spin-off from the Australian involvement in Pakistan was the development of a fledgling landcare movement in the country.

The outcomes of Australia's 10-year involvement in Pakistan have been detailed in a book titled *Saline Agriculture for Irrigated Land in Pakistan: A Handbook*, written by Dr Barrett-Lennard in collaboration with Professor Riaz Qureshi of the University of Agriculture in Faisalabad.

ACIAR: <A1005>

Honeybee cross-pollination important in avocados

A study in South Africa has shown the benefits of avocado cross-pollination using bees.

The study, in the 1997 Yearbook of the South African Avocado Growers Association (Honeybees in an Avocado Orchard: Forager Distribution — Influence on Fruit Set and Colony Development, by M F Johannsmeier et al), worked on a trial orchard near Mooketsi.

The trial orchard consisted of four-year-old Hass trees, in every 20 rows of which a single row of Ettinger pollinizer was interplanted. Powder-marked bees foraged up to 300 m from the hives along the rows, but only up to 200 m across the rows of fruit trees and windbreaks. In open-pollinated and bee-caged Hass x Hass crosses, the initial fruit set was significantly lower and the subsequent fruit drop significantly higher than in similar Hass x Ettinger crosses. In all treatments without bees, fruit set was greatly reduced compared to the treatments with bees.

Avocado A type cultivars have pistillate (female stage) flowers in the morning and staminate (male stage) flowers in the afternoon. B type cultivars, on the other hand, have staminate and pistillate flowers during the same respective periods. The general opinion seems to be that avocado requires a pollen donor cultivar of the opposite flowering type to increase fruit yield.

Some avocado cultivars however have been reported to yield commercial crops in single cultivar plantings. This has been explained by the daily bisexual phase of flowers which enables intra-cultivar pollination, particularly in A types.

[WA Horticulture / 1998 Apr 2]

Hard yakka needed to grow good olive trees

Gingin grower Mark Edmonds oversees 2500 olive trees and has heard many fanciful tales of high returns from low inputs.

It seems that many people outside the horticulture industry see olives as an easy crop to grow — simply plant the trees, watch them grow without any effort and reap high financial rewards is the common thought.

But that is simply laughable, according to Mr Edmonds. From experience he knows that the time and effort you put into olive trees is directly correlated to their performance and yield.

Mr Edmonds carries out day to day maintenance with his wife Maggie and partners

Graham and Margaret Dawson.

He said the amazing growth of olive trees on his property was a result of the care they received. Two-year-old trees were typically over two metres high and a few 18-month-old trees even boasted fruit which was more common on five-year-old trees.

“You really do need to fertilise olive trees to get good results,” he said. “Our trees are all on drip feed. Basically, it is poverty sand that we are growing on so it is almost a hydroponic system to give them what they need.”

Leaf analysis and soil testing was a common practice on the Gingin property, but well worth the cost Mr Edmonds said.

The soil had a pH which was far too low for successful olive growing and there was a calcium deficiency, all picked up through the extensive and regular testing program.

Mr Edmonds said he was very excited about a new product on the WA market — a calcium nitrate mix. In his former home in Rhodesia the mix was readily available and used extensively by horticulturists. But until recently Mr Edmonds could not access the product in WA.

“A lot of people say that if you have a calcium deficiency you throw on a lot of lime, but lime takes a long time to work,” he said. “A calcium nitrate mix is the answer and I am very glad somebody has decided to start importing it.”



Mark Edmonds with an 18-month-old tree which is already producing fruit

Mr Edmonds said he inspected his grove on foot. "I don't have a fancy motorbike so I simply walk and walk through the grove," he said.

"I always have a pair of secateurs with me. You would be amazed what you notice that

you would otherwise miss if you simply drove down the row.

"Just this morning I noticed some scale which I simply would not have seen by driving past on a motorbike."

[West Australian / 1998 Mar 18]

Oil mallees promise big Wheatbelt benefits

One of the biggest replanting jobs in WA's history will help stem the Wheatbelt's creeping salt problem and make the State the world's biggest eucalyptus oil producer.

The **Oil Mallee Association in WA** aims to have 500 million oil-producing eucalypts planted on Wheatbelt land in the next 20 years.

It hopes that eucalyptus oil will find its way on to the world market as a solvent, replacing other less environmentally friendly products.

Ric Collins, the association's administrator, said that research into the selection of suitable eucalyptus varieties for oil production had started at Murdoch University in the 1980s under the guidance of Professor Alan Barton.

The Department of Conservation and Land Management was also heavily involved and five or six oil mallee tree species had been identified as high oil producers. Mallee trees once grew naturally in many parts of WA but had been cut out to make way for crops and pasture. Replantings would lower the water table on farms as the deep-rooted trees sought moisture, preventing salt from rising to the surface, Mr Collins said.

The Oil Mallee Association was confident that after four years of trials, it had an

appropriate management package for the successful establishment of oil mallees in the Wheatbelt.

"The traditional eucalyptus oil market is small and takes only 3000 tonnes annually, but the use of the oil as a solvent gives it much wider application," Mr Collins said.

Most oil was produced in China where it was little more than a cottage industry. In Australia, eucalyptus oil was produced in NSW and Victoria. It was used in pharmaceutical and cosmetic products.

Mr Collins said between 2.2 million and 2.5 million oil mallees would be planted this year, taking WA plantings to more than nine million. Another four million would be planted in 1999 and eight million in 2000.

Mr Collins said that studies showed that between 10 and 20 per cent of the Wheatbelt needed replanting with trees to cope with the salt problem. He did not expect all plantings to be eucalypts but they were attractive because they had multiple benefits.

Kieran Forrest, technical officer with the Narrogin Agricultural College, said eucalyptus oil was a huge industry just waiting to blossom. The college had helped with the establishment of eucalyptus trees in a trial on a farm near Narrogin. Sown in alleys with space between rows for crops and pasture, they had reached a height of 4-5 m in two and a half years.

— *George Boylen*

[WA Horticulture / 1998 Jan 8]

Blueberry perseverance wins out

In hindsight, Greg and Susan Luke should never have planted blueberries on their idyllic Rainbow Coast property, 20 minutes from Albany.

The export market they perceived is almost impossible to access and major retailers are almost all supplied with blueberries by one big grower in the eastern States.

“The supermarket chains like to deal with one person and a big company in Coffs Harbour grows about 90 per cent of the Australian supply,” Mr Luke said.

“We are talking one hectare here and they are talking thousands of hectares using machines to harvest — you can’t compete on that scale.”

Initially the couple were also protected from big producers in Northern NSW because of Queensland fruit fly, but now legislation had changed to allow their product to cross the WA border if they are fumigated. But the Lukes have persevered with their venture and turned the adverse factors into a winning combination.

While a big percentage of the crop grown by Mr and Mrs Luke is sent to retailers and restaurants on the South Coast, a substantial portion is bought by tourists at the farm.

The couple started researching a horticultural crop in earnest about 1983 and decided blueberries had potential. They were living in Katanning at the time. Mr Luke was an irrigation specialist with Agriculture WA, he still works a few days a week in Albany.

“We wanted to get a farm in Albany and



Greg and Susan Luke display their value-added products

we realised that the blueberries would grow down here,” Mr Luke said. “We went looking for a property in the area with an acid soil. “Blueberries require very acid soil so we had to find a property with the right soil types and also suitable water.

“Most people tend to buy their block and then look for something to grow on it—but that does not work in a lot of cases.”

The Lukes thought blueberries were the best option because they were a new crop and there appeared to be an export market for them.

But the export market coincided with live crayfish being flown out of Australia at very lucrative prices and using all the available cargo space. We decided to follow the value-adding route as we just could not afford to

compete for that space," Mr Luke said.

Today, blueberry jams, preserves and wine were the mainstay of the farm which was also a favoured tourist haunt. The tourist factor also influenced the Lukes' decision to grow one crop without pesticides.

There are now 2000 bushes of different varieties to those initially planted. "When we first started no-one could advise us on which varieties to grow so there has been a lot of trialling," he said. "We now have three different species as well as a whole lot of different varieties and that mixture gives us a season from about November to April coinciding with the tourist season.

"If we were going for an export market we would probably get rid of a lot of varieties that we have in because we would be better off to have a lot more crop over just a few months.

"We have a number of varieties which really don't produce a lot because they are not really suited, but they do fill a time of the year when there is not much fruit available. From that point of view, they are worth having for tourists who come to the farm."

Blueberry wine was also a big hit with tourists, the Eden Gate range included everything from a sparkling wine to a liqueur. There was a misconception that second-grade fruit was used for the wine. "If you use damaged or rotten fruit then those flavours will come through the wine," he said.

"We only use top quality fruit for the wine and if you weren't told it was blueberry wine, you would just assume it was a great wine."

The blueberry wine did have some distinct characteristics, but it was similar, he said, to saying Cabernet was different to Shiraz. It had a number of distinct characteristics - it did not contain antihistamines and did not create allergic reactions.

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CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: Jul 20

1998

- May 15-16 §South West Olive Conference, Margaret River
- May 17 Sun §Macadamia Field Day, Gidgegannup
- May 19 Tue General Meeting (Barry Shelton - Palms with Edible Products?)
- May 31 Sun Paulownia Field Day (Wanneroo & Gingin)
- Jul 7 Tue Executive Committee Meeting
- Jul 11-12 §Australian Quandong Industry Association Conference, Netherby, South Australia.
- Aug 18 Tue General Meeting (?Pin Tay - Less Usual Fruits of Southeast Asia?)
- Sep 6 Sun WANATCA Bring & Buy Meeting
- Nov 17 Tue Annual General Meeting (?Zora Singh - Ber & Jujube?)

*General Meetings are held starting at 7.30pm. Venue: Theatre Room, Kings Park HQ, West Perth. These meetings usually include a current magazine display.

• Event with WANATCA participation; § For contact details refer to the Tree Crops Centre.

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