

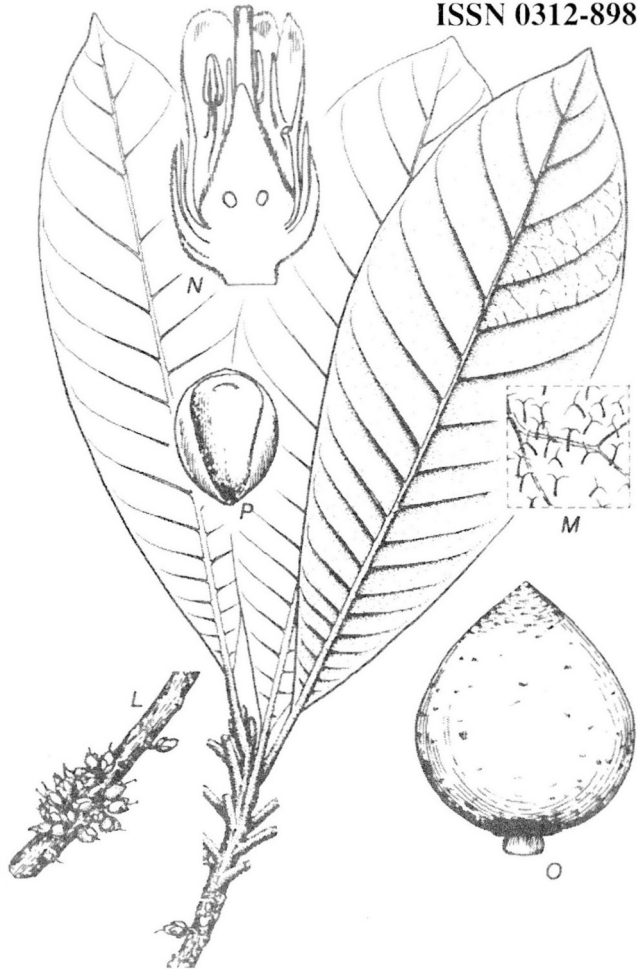


Quandong

magazine of the
West Australian Nut & Tree Crop Association (Inc)
www.AOI.com.au/wanatca

Second Quarter 2004 • Vol 30 No 2

ISSN 0312-8989 • \$5.00



The Green Sapote, *Pouteria viridis* (See: About the Cover, p. 2)

Quandong • Second Quarter 2004 • Vol 30 No 2

***DON'T MISS THE NEXT WANATCA GENERAL MEETING:
7.30 pm, Tuesday May 18, 2004.***

At our next meeting, Dr John Koch of Alcoa will give us a presentation on:

Precision Restoration of Tree-Based Ecologies After Mining

This meeting is at Kings Park. See the attached flier and the article on page 23.

THE NEXT WANATCA FIELD DAY:

Olive Production and Olive Oil Processing

Meet at **York Olives**, Ashworth Road, York at 11 am, Sunday May 23. See the attached leaflet. All welcome. Our host, **Arnaud Courtin**, 0429-412 200.

Late enquiries to 9250 1888 please.

In This Issue

Jujube industry in WA off to good start	3	ANIC in a nutshell.....	18
Moving forward with feijoas in New Zealand	6	Biodynamic farm succeeds with CSA approach	19
There's more to tea than you thought	8	Jackfruit growing well in Perth	20
Ken Adcock on Yerba Maté	8	Avocado growers restructure industry	21
The bitter truth	9	DIY olives in the suburbs	22
Green Tea project moves ahead in WA	11	Putting back tree-based ecologies after mining	23
Pestered Arabian tea tree owner to bring in chainsaw	13	Sustainable agriculture powered by olives	24
Rooibos Tea	14	2004 National Olive Industry Conference in Perth	25
Tony Riggall - Nuts about nuts	16	Green sapote roundup	27
WANATCA Yearbook Online website opens	17	The Fruit Is Uncommon, the Care Is Not ..	31

About the Cover

The cover drawing of the Green Sapote is from T D Pennington's book *Sapotaceae*. See the Green Sapote Roundup on page 27 and the extract from the book on page 30.

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.

Jujube industry in WA off to good start

Commercial production of fruits of the Jujube or Chinese Date, *Ziziphus zizyphus*, has been a promising development for many years, but till now has never really got off the ground. Now all that may change.

While potential growers have been attracted to the crop, the difficulty has been getting tree stock in the quantities required. Grafted jujubes have been as scarce as hen's teeth, and prospective jujube orchardists have given up in the face of the poor supply situation.

Now WANATCA member Jim Dawson,

of Gidgegannup, has made a significant dent in this problem. Jim has established a new jujube orchard which this year should yield one tonne of the fruit, which is finding a ready local sale to ethnic groups such as the Chinese and Vietnamese, who are already familiar with the product from their homelands.



Jim Dawson with a loaded jujube tree

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, address, and phone numbers, also fax, e-mail, and web page details where available.

Quandong: Atcros ref. <A1466>.

In China jujubes are one of the leading fruits produced, with tonnages far above those of what Australians regard as staple fruits, such as apples or pears. Australians can sometimes buy jujubes in the dried form, when they are called Chinese Dates or Red Dates (the fruit is unrelated to that from the Date Palm, *Phoenix dactylifera*, although there is similarity in taste). But few are familiar with the fresh fruit, some varieties of which resemble small apples in appearance and taste, though with a more nutty texture.

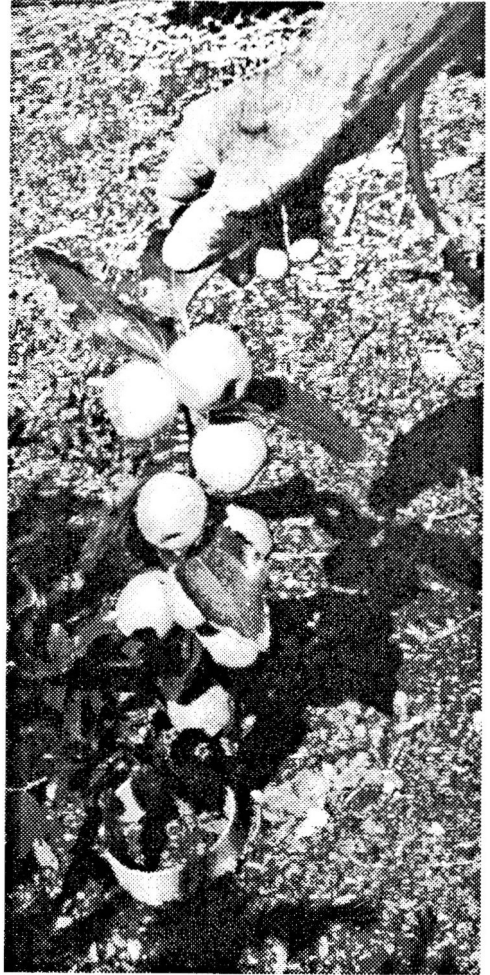
But the most important aspect of Jim's work has been his development of methods for rapid propagation of grafted trees. This season he expects to have around 2000 trees of named varieties for sale, and if this rate of production can be maintained and increased, it may give the crop the kickstart it needs for commercial success.

Jujubes have a tendency to grow suckers from their roots, and Jim's propagation method exploits this tendency. All the trees in his production plot are on a good vigorous stock variety which does well under local conditions.

Jim goes round his trees with a spade, and cuts into the ground about a metre away from the trunk to cut across surface roots. Suckers spring up from the cut ends, and Jim T-buds these directly, close to the ground.

Because the grafted suckers are still attached to the parent plant, they grow very vigorously and fruit early, as soon as 12 weeks after budding. Jujubes are deciduous, and the new grafts are usually dug and sold after leaf fall in late autumn or early winter.

"I've got 5 or 6 varieties which I propagate", Jim said, "but the usual favourite of my farm-gate customers is a round variety called Chico, a variety selected in California. I also have Li, a large fruit, Silverhill, one of Roger Meyer's



This sucker was budded to 'Li' in November 2003. By March 2004, it had this crop of 9 large fruit

recommendations, and a Chinese variety called Tan-Jan-Zao".

One of the surprises of Jim's propagation methods is that his budding may be done well into the heat of summer, and that this bud may produce a significant amount of fruit later in the same growing season.

There are some things needed to be be

known in propagating jujubes successfully. "Jujubes produce different types of bud", he said. "Some grow into thin twiglets which are shed, with the leaves, in autumn. Others produced a very compressed branch structure called a 'cone', looking like a tiny pine cone, which fruits each year but only grows a millimetre or so. You need to choose a cone-type bud for grafting, else the graft will be shed when the leaves fall".



A 'Chico' jujube in a pot, about 30 cm high, with a crop of over 30 fruits

While this is still early days, Jim says a few people have already made the decision to take the crop seriously in WA. One of his customers has established a planting of about 1000 trees near Cue, about 250 km northeast of Perth.

"Cue is regarded as a very dry area, and while jujubes have outstanding drought resistance, Tom Jackson does have access to good underground water", Jim said.

— *David Noel*

Jim Dawson has agreed to act as WANATCA's new action group leader for Jujube. Contact him on 9574 6371 to order trees now — his stock will go fast!

A good introduction to jujubes is the paper Jujube Orchards, presented at Acotanc-2001 by Roger Meyer, WANATCA's

Californian specialist in jujubes and other uncommon fruits, and available on the web at: www.aoi.com.au/acotanc/Papers/Meyer-1.

¥

PECAN NUTS WANTED

**Good quality Pecan
Nuts required for
shelling**

Larger Quantities preferred
Contact BJ & CF Rochester
Mumballup Pecan Shelling
Ph. 08-97341309, -97322051
Fax 08-97343343 • <A3135>
90 Bucktin St, Collie 6225

[*The Tree Cropper (NZTCA) / 2004 Mar*]

Moving forward with feijoas in New Zealand

There was a good turnout for the Feijoa Growers Conference held in Hamilton on February 13 and 14, with a good blend of practical growing and marketing information.

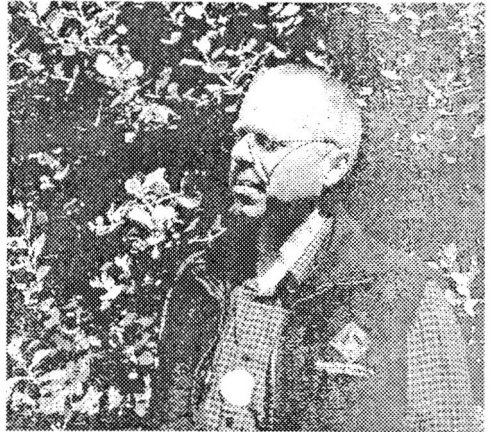
After the annual general meeting a number of research projects were outlined which have the aim of increasing storage life of the fruit, which should boost export success. Research work funded by the Foundation for Research, Science and Technology is to improve storage to cover the four to five week shipping period to overseas markets as well as the following three to five day shelf life.

When the ripening process is slowed, fruit rots, which cause browning and a gritty texture in the fruit, can be reduced. But one problem was the large number of different varieties which were exported, which all behaved differently in storage.

Separate trial work into postharvest pathology issues funded by the Association also gains contributions from the Sustainable Farming Fund. It looks at different fungi which occur in orchards and in storage.

A third research project running over four years is being carried out by the Feijoa Supreme Group, a cooperative of growers and technology companies and the Association. The aim is to be able to produce 15 tonnes of 70 to 140 gram-sized fruit a hectare. In the almost two years it has been running researchers have looked at orchard watering records, fertilizer inputs, fruit maturity and storage data to see why some orchards are doing better than others.

One finding already in is that many growers, particularly later in the season, are selecting too many fruit outside of the preferred maturity range. A magazine survey carried out last year by the Association gave a good



Frans de Jong talks to delegates in his Matamata orchard

steer on consumer requirements for feijoa growers and marketers. While half of the respondents said they ate a combination of homegrown and store bought fruit, 39 per cent only consumed those which were homegrown and 11 per cent only went to the shop to buy them.

A higher than expected 57 per cent of those who only purchased feijoas said the quality of store bought fruit was good. Forty per cent bought the fruit once a week and 53 per cent made their purchases at supermarkets, while 31 per cent dealt with independent traders. For 80 per cent of buyers, feijoas were an impulse buy, and 23 per cent said they would buy more if they were more widely available.

On Saturday the first stop on the field trip was Alastair and Mary Lock's two hectare Forrest Park orchard between Hamilton and Cambridge. In 1999 the orchard, consisting of

310 feijoa and 285 mandarins, was planted on the Horotiu sandy loam. The feijoas are predominantly of the Unique variety.

Pruning is required twice a year with summer pruning after flowering, and a major structural pruning following harvest. As Alastair and Mary both work off the property, their pruning method has moved from secateurs to hedge clippers for trimming, which has proved to be satisfactory.

Depending on conditions Alastair would expect to spray with copper several weeks prior to harvest to control any fungus. At this stage the trees average just over 1.5 metres in height and Alastair said they don't want them to grow too much higher for ease of pruning and picking the fruit. Trees which are not performing are marked on the trunk to indicate extra attention may be needed.

When the trees were first planted they were mulched with sawdust and horse manure from local stables. This retained moisture and gave them a good start. The fruit is picked daily, determining maturity by touch. It is then polished with cotton gloves, graded and dispatched to a variety of outlets. Forrest Park also has 150 Silverhill and 135 Encore mandarins, with the harvest of the first variety coming after that of the feijoas and Encore quite a bit later, which helps with the workload on the property.

The next stop was the Southernbelle orchard out of Matamata, recently bought by Dutch immigrants Frans and Tineke de Jong. There are 1500 feijoas on their property, some of which were planted 27 years ago. The orchard also produces blueberries, nashi, persimmons, chillis and capsicums, so they have a good income spread. An extensive pruning programme got underway last year with the result that fruit harvest is likely to be

substantially down but light and air was badly needed in the trees.

After lunch the conference delegates went on to Caroline Eason's property on the slopes to the west of Lake Karapiro. A total of 280 feijoas of the Triumph and Mammoth varieties were planted here 17 years ago to add another source of income to their dairy farming operation. From \$6,000 to \$8,000 a year is brought in, but that is expected to be well down this year as a serious pruning has been undertaken.

— *Glenys Christian*

Tree Cropper: A3052.

NZTCA: New Zealand Tree Crops Association Inc: A1427.

¥

IT'S MACADAMIA TIME ! ! TREES

Order Now. Proven yielding varieties, good sized healthy grafted trees.

MACHINERY

Dehuskers, Crackers, Harvesters
NEW RANGE Ideal for smaller
Orchards. Larger models also available.

CONSULTING

Advice on site suitability, preparation, orchard layout and management. Site inspection. 10 years of experience.

Contact



Shelterbelter..
TREE PLANTING SYSTEMS
Australia

Phone: 08-9574 6163 • Fax: 08-9574 6031

Email: treebrick@bigpond.com.au

There's more to tea than you thought ...

When we talk about "a cup of tea" we usually mean what you get by dunking in hot water a teabag containing black tea, from the fermented leaves of *Camellia sinensis*, a species of a family also containing flowering *Camellias*. However in other parts of the world "tea" can mean the leaves of quite different plant species, or (as in Green Tea) it can mean *Camellia sinensis* leaves processed quite differently. In this 'roundup' we'll look at some of the others.

First there is *Yerba Maté* or South American tea, derived from a plant in the Holly (*Ilex*) family. This is the standard "tea" in countries such as Argentina and Paraguay, and is traditionally drunk through a metal 'straw' from a small hollow gourd, about as big as an ordinary teacup. One of our WANATCA members is growing and propagating *Yerba Maté*, and has recently put some plants in for sale at St Barbe Grove, the Men of The Trees nursery in Hazelmere. I've drunk *Yerba Maté* (the second word is pronounced 'martay') and it's pretty good. It was more widely available in Perth some years back when coffee harvests failed and the high price of coffee encouraged retailers to look for substitutes.

There are some 400 different species of *Ilex*, and most of them contain significant amounts of caffeine and theobromine, the stimulative plant substances in coffee and tea. According to the Census of Australian Vascular Plants, there is even an Australian native species, *Ilex arnhemensis*, found in northern WA, the NT, and northern Queensland. Perhaps someone should test this for its value as a beverage.

Ken Adcock on *Yerba Maté*

I have some *Ilex paraguariensis* plants to include in the St Barbe Grove Nursery.

The plant is also known as *Maté* or *Yerba Maté*. It is very versatile small tree to 6 metres, green leaves, white flowers, red berries on the female tree so you need one male and one female to get viable seed. It grows on any soil type and can be pruned to shape, the only pest is aphids.

I got the original seed from Ian Fox some 25 years ago and have grown the shrub and drunk the tea ever since. I pick new buds and the top 2 or 3 leaves while they are still soft. Dry them in a microwave, break them up to remove the woody stems then store them in a jar.

To make tea I use a coffee plunger and use boiling water over the leaves, I prefer to drink it warm and it makes an enjoyable substitute for green tea. There is no caffeine in it according to the better articles, but some other articles say there is.

Yerba Maté contains mateine, which is in the same Xanthine group as caffeine. It is mildly stimulating and refreshing but it does not work like caffeine and can be drunk before going to sleep. I normally suffer from migraine headaches with caffeine withdrawal symptoms but with *Maté* there are no ill effects. It contains practically all of the vitamins necessary to sustain life.

The World Wide Web contains lots of information on it and it appears to be becoming trendy in America. Some of *Maté's* alleged attributes are it boosts immunity, detoxifies the blood, tones up the nervous system, restores

hair colour, retards aging, combats fatigue, stimulates the mind, controls the appetite, reduces stress, and eliminates insomnia, etc etc etc.

There are 50 million South Americans who have been drinking it for years. The Yerba Mate sold in health food shops isn't as good as the home grown stuff. It has a earthy taste and has lots of dust in it.

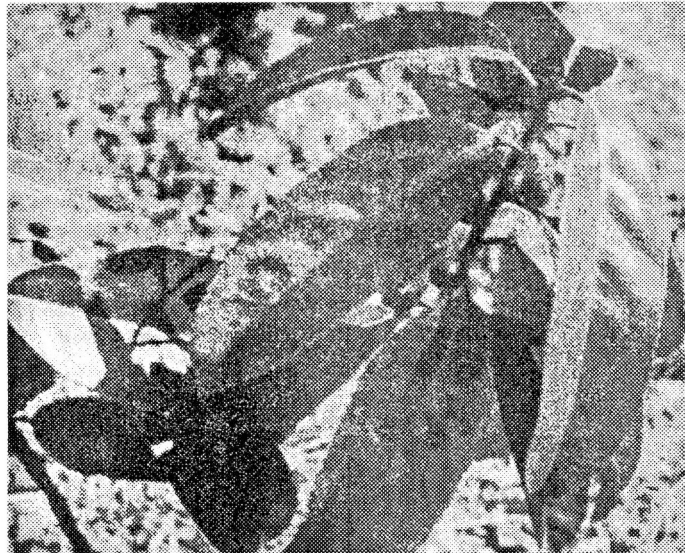
— Ken Adcock, Plant Pathology, Agriculture Western Australia, South Perth, 6151. Phone 08-9368 3290, email kadcock@agric.wa.gov.au.

The following article describes another Ilex species used for tea in Vietnam and China.

[*The Tree Cropper (NZTCA) / 2004 Mar*]

The bitter truth

When we were working recently in the farming villages in North Vietnam we found



Ilex kaushue

it was common practice to start each session with cups of tea. Special provision was made for this at all the public offices and community meeting places.

The cups were tiny, which was to us a relief, because the tea we felt obliged to share with our hosts was green tea, and not often to our taste. If one of the women-folk made the tea it would likely be more bearable, but the men had a habit of throwing great handfuls of tea-leaves into the pot, which would make the green tea very strong and bitter.

Green tea

Green tea is made from the same tea plant, *Camellia sinensis*, as the regular tea we are accustomed to here in New Zealand, but it has been prepared differently.

In the preparation of our usual tea the leaves are fermented, while those used for making green tea are steamed to prevent fermentation. I find the resulting green tea rather too bitter for my fancy, but felt I had to respond to our hosts' hospitality by accepting it. The trouble was, I couldn't get away with just a few polite sips, because they kept topping up the cups!

Bitter tea

Anyway, you can imagine my apprehension when one farmer declared he would, as a special treat, prepare for us bitter tea. This is made from a completely different plant, and more expensive, so how could we refuse his hospitality? I found the experience somewhat unusual. The tea has a pure,

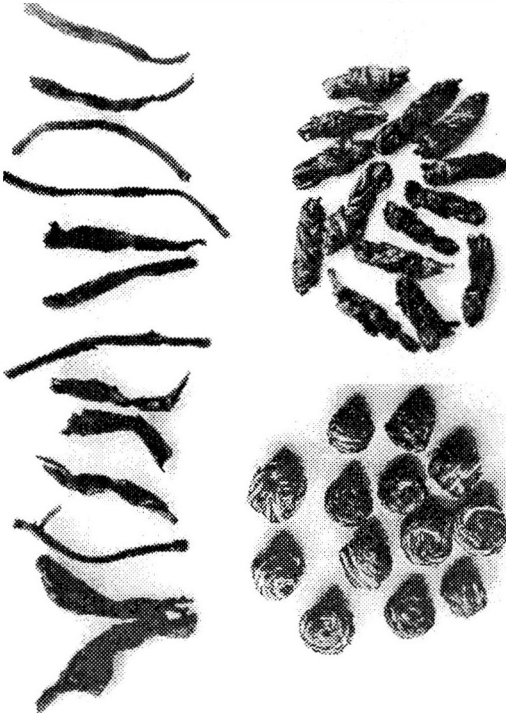
distinctive bitter taste, which, at first, would seem to make it undesirable. But there is also an underlying sweet taste — one which becomes pronounced once the bitter wears off, just moments after taking a sip of the tea. It doesn't take too long to become accustomed to the taste and then find it attractive, in much the same way that coffee and other bitter drinks are desired.

The strength of the tea can be adjusted to one's liking, and, perhaps because of the expense, the farmer was more restrained in the amount he used. Besides, hot water can be added again to the leaves, even several times, to make more tea.

So, in spite of the daunting name, it was the best cup of tea I had while in Vietnam!

The bitter tea tree

Bitter tea is usually made from the leaves



Ilex kaushue treated leaves and seed

of a particular species of holly, *Ilex kaushue*, (sometimes referred to as *Ilex kudingcha*, after its common Chinese name).

This evergreen tree has a long life span, and can become quite a large tree, up to 30 metres high if allowed, but repeated harvesting of the leaves keeps it to a manageable height. The leaves are long, slim, without the points common to other holly plants, and somewhat rubbery in texture.

The dried leaves are commonly presented twisted together to form a narrow 'spike', or may be formed into balls or rolls.

Another plant which is occasionally used in China and Japan to produce bitter tea is a species of *Ligustrum*, the genus which includes our common privet.

Development programme

Thousands of hectares of Bitter Tea are grown in south-western China, where it is known as Ku Ding Cha. Over the border, in Vietnam, there are small areas of the bitter tea plant growing naturally in the mountainous northern regions where we were working.

However, United Nations has funded a Development Programme to encourage farmers to participate in an agrobiodiversity initiative to revegetate barren land and alleviate poverty. Some \$US 17,500 has been spent assisting growers with the provision of seedlings, fertiliser, soft loans and post-harvest services.

The authorities estimate bitter tea growers could earn around 5 million Vietnamese dong per hectare per year. But this is not the fortune it seems, because past high rates of inflation means this equates to only about \$NZ500. Besides, land-holdings are very small. Our small team of New Zealanders was involved in a similar development programme, instructing farmers on chestnut growing.

A health drink

Considerable health benefit is attributed to bitter tea, and throughout China and Vietnam it is regarded as a traditional medicine, to keep the body healthy and to help overcome infections.

Modern research also suggests that the herb promotes blood circulation, lowers blood pressure, and lowers blood lipids, including cholesterol. It may also invigorate digestion and improve mental focus and memory.

The main active components appear to be particular saponins, and it also contains polyphenols and flavonoids, somewhat like those found in ordinary tea.

It was certainly the best cup of tea I had while in Vietnam, but I think I'll need many more cups to counteract my declining physical condition as age catches up with me!

— *Maurice Denton*

Green Tea project moves ahead in WA

As mentioned earlier in this article, Green Tea is made from the same tea plant, Camellia sinensis, as the regular tea we are accustomed to here, but it has been prepared differently. In the preparation of our usual tea the leaves are fermented, while those used for making green tea are steamed to prevent fermentation.

An article on a major project to produce Green Tea at Manjimup, in our Southwest, appeared in the Third Quarter 2003 Quandong. WANATCA President Stanley Parkinson has been following up this project and has received the following update from the Shire of Manjimup, one of the promoters of the project.

Thank you for your interest in the Green Tea Growers' Seminar held in early December

Second Australian New Crops Conference

Australian
New Crops



Innovation & Change for Australian Agriculture and Horticulture
In association with the 10th Australasian Conference on Tree and Nut Crops
(ACOTANC-2004)

Pre-Conference Workshops 20 & 21 September
Conference 21 – 24 September 2004
Primary Producers' Day (New Crops Options Day)
Saturday 25 September

The University of Queensland, Gatton Campus

For more information please contact
Sally Brown, New Crops Conference Secretariat
PO Box 108, Kenmore, QLD 4069 Fax: 07 3201 2809 or email sally.brown@uq.net.au
NC2004 website: www.newcrops.uq.edu.au/nc2004/

2003. I apologise for the delay in advising you (on behalf of NOAH [New Opportunities for Australian Horticulture]) that I have included your details on a database of people who completed the application form to become a member of a Green Tea Grower's Group.

It is our intention to produce a Newsletter on a regular basis (perhaps quarterly) to provide an update on the progress of the Green Tea project. At this point you will no doubt be interested to know that:

- a Green Tea Partnership Committee meets each fortnight to drive the project. The committee membership includes representatives from Shire of Manjimup, Forest Products Commission (FPC), SW Development Commission, Department of Agriculture WA, New World Flora and NOAH (New Opportunities for Australian Horticulture);

- negotiations are continuing with

Kunitaro Company Ltd, one of Japan's major Green Tea manufacturers and exporters;

- on successful completion of negotiations a collaborative research and development program will be progressed by FPC and Department of Agriculture WA;

- from this research and development program Green Tea plants will become available for sale from FPC and New World Flora subject to the signing of a non propagation agreement;

- Green Tea plants will be available to growers from 2008 for first commercial plantings;

- a Green Tea Industry Development Plan produced by Economics Consulting Services, Perth is available from Shire of Manjimup at a cost of \$10.

— **Jim Lee**, Manager Economic Development, Shire of Manjimup. Phone 08-9771 7777, Email: info@manjimup.wa.gov.au.



Tender tips on the leaves of this Catha edulis, or Arabian tea tree, have made it so popular its owners can't stand the traffic any more

Some years back many Perth nurseries used to stock a quite attractive bronze-leaved shrub called Catha edulis, better known elsewhere as Khat or Arabian Tea Tree.

As the name implies, the plant can be used to make a stimulating tea, which is very popular in its native areas of Ethiopia, Somaliland, and Yemen. People from there also chew the leaves as a stimulant.

Khat is somewhat addictive, perhaps somewhere between coffee

and marijuana, and some health workers have spoken out about its overuse — but what natural plant product hasn't been attacked for this in recent years?

In my opinion, commercial production of Khat in WA could be a lucrative niche industry, even if only as an export crop to African and Arabian countries where it is in high demand.

Stanley Parkinson has been interested in this beverage crop, and gave a paper on it at the Acotanc-2001 Conference. So far this paper has not made it to the Conference Paper website.

[Post / 2004 Feb 28]

Pestered Arabian tea tree owner to bring in chainsaw

A chainsaw is about to end the problem of a Woodlands woman fed up with people ripping leaves and sometimes branches from the Arabian tea tree in her garden.

The owner said last week: "We are fed up, after nearly five years, of people trampling our garden, even breaking the fence, to grab at the branches to get the tender young leaves on the tips of the *Catha edulis*."

"It started when a man knocked on our door and said he was from Somalia and that he would like to take some tips from the shrub."

"He was very polite and we agreed he could have some. Apparently he wanted to brew it up like tea — it is supposed to have some health properties — or, some people say, as an aphrodisiac."

"But instead of one man calling in occasionally, it has mushroomed out of control. It's a real pest."

"We have spoken to these people and asked them not to damage the tree, and they promise to tell their friends and family to leave it alone, but it goes on."

"We have had people call here at night — others go into Hale School next door and reach over the fence to grab the branches".

The owner said leaf raiders had broken her fence and she had had to replace four sheets of fencing.

"Last weekend was the worst — I found branches torn off and tossed back over our fence," she said.

"It used to be a beautiful shrub or a small tree, with clumps of bronze leaves, but now it's a wreck."

She said she had called police and been told the best solution to the problem would be to cut down the shrub.

Police would not act unless provided with evidence including details of her seeing leaves being taken, and she would have to go to court.

Nut & Tree Crop Consultants

<A1101> • (Principal: David Noel)

PO Box 27 Subiaco

WA 6008

Phone 08-9381 7341

Fax 08-9381 2607

e-mail:

nutconsult@AOL.com.au

**Local, Australian &
international services —**

see our website:

www.AOL.com.au/

nutconsult

Finally we look at Rooibos or Redbush Tea from South Africa. According to the following article, Rooibos is becoming the second most important tea in world trade. It is certainly popular in South Africa, Rooibos teabags are seen next to every office tea-urn.

Maybe someone should look at growing it in WA. However, in contrast to Khat, they would be up against an efficient and developed South African industry,

[www.itmonline.org/jintu/rooibos.htm]

Rooibos Tea

Rooibos, meaning "red bush," is a South African plant of the Legume family (Fabaceae, aka Leguminosae), with bright green, needle-like leaves that turn red upon processing. The shrub, *Aspalathus linearis*, has a very limited growing area, only in the Cedarberg Mountains of the Western Cape of South Africa, mainly at three small rural communities: Wupperthal, Eselbank, and Heuningvlei (see Figure 1).

The mountain-dwelling people of the Khoi tribe (sometimes called "bushmen") who live in that area were the first to develop a method for making tea from rooibos, a practice traced back at least 300 years. This tea was also appreciated by the European settlers.

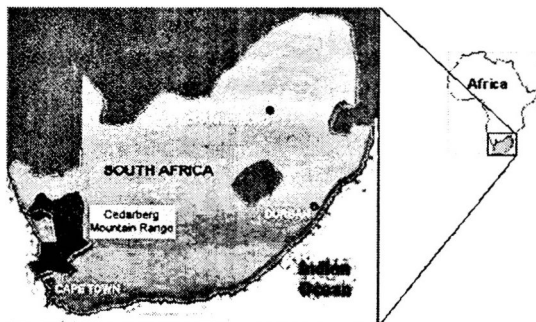


Figure 1: Growing location of *Aspalathus linearis* (Rooibos), in the Cedarberg Mountains

Though the process of making the tea leaves ready for brewing has become more automated in recent years, the steps remain the same: the leaves (and sometimes twigs) are picked, bruised, fermented ("sweated"), then sun-dried. It is the bruising step, in which the leaves are hammered or crushed, that allows the material to develop its distinctive red colour during the sweating process. The tea, cherished for its deep aroma, full-bodied taste, and health benefits, is the most popular drink in South Africa. It is enjoyed hot or iced, plain or sweetened, with milk or without.

Three flavonoids — quercetin, luteolin, and aspalathin — give rooibos antioxidant properties, which provide the main health benefits attributed to regular consumption of the tea. Antioxidants are understood to reduce some of the effects of aging, preventing damage to the circulatory system by lipid peroxidation; they also help block carcinogenesis.

In addition, these flavonoids have allergy-inhibiting activities, with effects notable at relatively high dosage levels (e.g., regular consumption of the tea). Quercetin and luteolin are found in many herbs, though usually in smaller amounts; aspalathin is unique to rooibos.

Celestial Seasonings Tea Company, during its formative years, had introduced rooibos to North America as one of its important herbs for making good tasting and healthy herbal blends, but then withdrew it due to the U.S. embargo of goods from South Africa.

During the 1990s, the tea was once again imported; Celestial Seasonings and others, such as Good Earth Teas (for which rooibos is the central herb of their standard blend) and Montego in

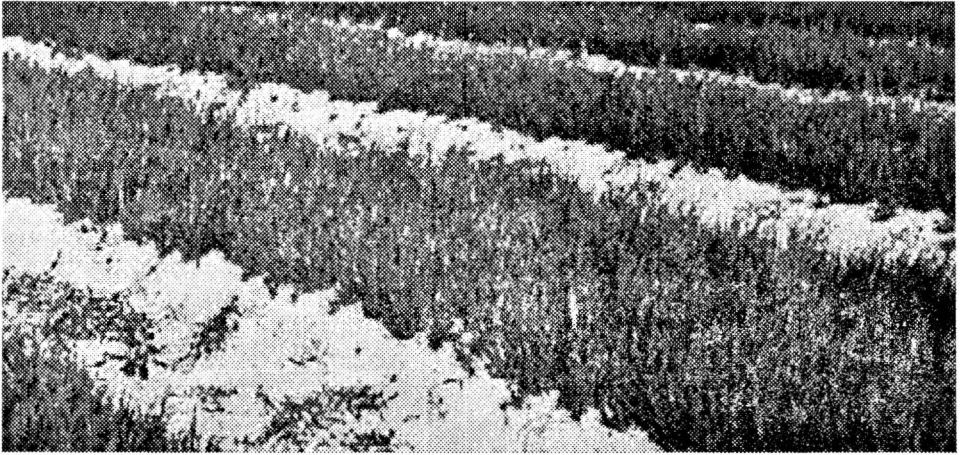


Figure 2: Rooibos under cultivation

Canada, have restored it to a prominent position.

The South African export control board reported 4,500 metric tons of rooibos exported in 2000, more than twice the amount for 1999. Major destinations include Europe (Germany, Netherlands, and United Kingdom), Asia (Japan, South Korea, China, and Malaysia), and North America (U.S. and Canada). Rooibos continues to be used extensively in South Africa, at a rate of 3,600 tons per year for the domestic market.

Rooibos appears headed to becoming the second most commonly consumed beverage tea ingredient in the world after ordinary tea (*Camellia sinensis*). Since the herb contains no caffeine, it is often selected when there is a concern about stimulant properties of tea. In fact, it is used as a bed-time tea to help alleviate insomnia.

The plant is now cultivated in order to meet the large demands. To help assure adequate supplies of rooibos and other natural products in the area, a collaborative project between the Agricultural Research Council

of South Africa, the US Herb Research Foundation, and Purdue University, was established under the name A-SNAPP (Agribusiness in Sustainable Natural African Plant Products).

A-SNAPP is helping South African small farmers make the transition from wild harvesting to sustainable cultivation, using organic cultivation methods. More than 75 farmers currently participate in the program, many of whom used to gather rooibos in the wild.

(Heading notes from David Noel)

¥

Pistachio Nut Trees

*Big healthy trees in big 6-litre bags
Grafted trees or rootstock only*

W.A. Pistachios, Northam

(Bert & Angie Hayes) • <A3114>

Phone/Fax 08-9622 9513

wapistachios@wn.com.au

PO Box 429, Northam WA 6401

[West Australian / 2004 Feb 26]

Nuts about nuts

Mt Barker farmer Tony Riggall is a man who makes ideas come to life. He jointly founded Goundrey Wines when he became interested in wine, started Mt Barker Geese and Duck when he could not find a goose for his Christmas lunch and is now establishing a walnut and pine-nut plantation partly because he likes fresh nuts.

His foray into free-range led to the now-famous Mt Barker Free Range Chicken, which he recently sold to concentrate on farming.

Riggall still grows all the chickens for his old label as part of the business deal, while his 2400 ha property is also home to the Palandri Wines' vineyard and a Tasmanian bluegum plantation.

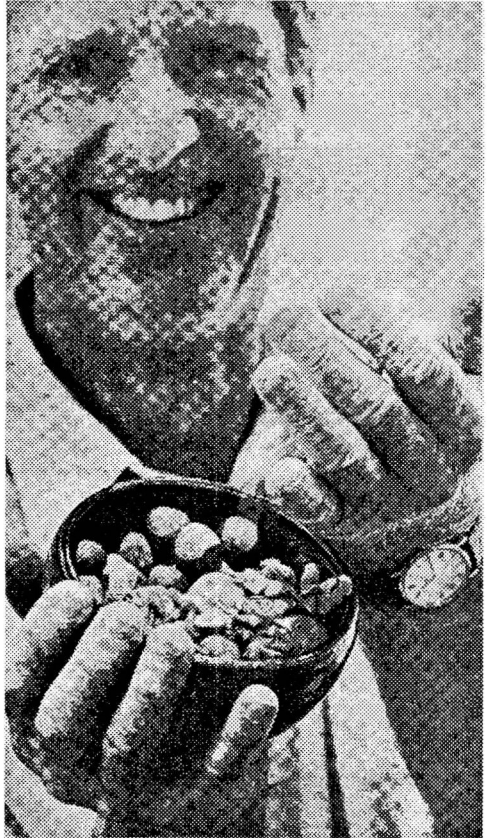
And, he says, he's semi-retired. "When I do eventually retire, it will be a very long retirement, it's called permanency, dead," Riggall, 58, jokes.

English-born Riggall emigrated to Australia in his 20s and settled in Mt Barker in 1967. He farmed cattle, sheep and crops, eventually moving into peas, free-range poultry, grapes, Tasmanian bluegums, and nuts in a bid to diversify his farm produce. Free-range geese and duck came long before the popular chicken.

Despite a niche market for geese and duck, Riggall says they proved too hard to pluck, so when the local abattoir came up for sale, he bought that and started growing chickens.

In the beginning, the Riggalls used to sell their chicken directly from a van with a chest freezer. Within no time, they had a steady and growing clientele.

"One of the happiest days of my life was when the meat buyer at Woolworths rang me up and said, 'Tony, we're going to need some of your chicken'," Riggall recalls. "There is always more and more demand for free range to the point where now Coles, Woolworths,



Tony Riggall likes nuts so much he's started his own plantation. Picture: Sandra Jackson

Inghams and Steggle are putting their own out."

Riggall's son Tom and his wife, Narelle, now grow all the chickens for the Mt Barker free range label on the family farm. "I wanted to still grow the chickens because I believe

fundamentally that we're still farmers. I mean, I can trace my farming generations back 10 generations, so farming's always going to be in my blood," Riggall, a father-of-three, explains. This is how growing nuts came about.

Though the Riggalls had no experience in growing nuts — nor wine nor chicken for that matter — Riggall thinks there's a market for fresh nuts in Australia, something he really feels has been lacking.

He is growing walnuts, pine nuts and hazelnuts, with plans to expand into macadamias and pistachios.

"If you go into a supermarket, just about 100 per cent of the nuts in Western Australia are all imported," Riggall says.

"Australia's out of sync with the nut seasons in California and Turkey — which each produce 80 per cent of all walnuts and hazelnuts respectively — so by the time we get them they are somewhat oxidised and a little bit rancid.

"So, I suppose I'm always looking — whether it be chickens, peas or nuts — at ways to replace the imports with something we can do here. We're looking to give you a fresh

product when you need it and chefs will pick that up like mad".

Riggall believes the long-term development of a good nut orchard is overdue.

"If you look at what happened to the wine industry, the chicken industry, the olive industry, the wheat industry — they've all become industries because they've been focused on world's best practice and I think nuts have got to go the same way," he explains.

"The wine industry is the classic example of how we should be doing business. We should be growing it, we should be marketing it to the consumer as much as possible with a branded product, and that's my long-term plan for nuts.

"My focus is evaluation rather than saying, 'I've got 10 acres of nuts'. I don't see that as anything at all, I just see it as a way of finding out what's happening in a new field.

"I'm quite a shy person but when it comes to business, I'm not necessarily so shy. If I need to know something, I'll just go out and ask."

— *Amanda James*

[Tony Riggall has been a member of WANATCA since 2001]

¥

WANATCA Yearbook Online website opens

The website for the on-line version of past and new WANATCA Yearbooks is now open. It is at:

www.aoi.com.au/wanatca/Yearbook.

Open to all Web users, this site has an index of all papers published in the printed version of WANATCA Yearbook in the years 1974 to 2002.

These papers in their full form are being progressively converted to PDF files which

may be downloaded by WANATCA members. Members access these downloads via a simple password check gate.

The password, the same for all members, will be changed each quarter. Members for whom we have a correct email address will have already been notified of the password by email. The password will also be printed at the bottom left-hand corner of the mailslip sent out with this issue of Quandong.

Members can also obtain the current password by emailing office@aoi.com.au, or by contacting the Association on the usual phone or fax numbers.

Australian Nut Industry Council: Annual Industry Report / 2002-2003

ANIC in a nutshell...

The Australian Nut Industry Council (ANIC) is the federation of the Australian tree nut producing industries.

ANIC represents:

- *Almond Board of Australia*
- *Australian Pecan Growers Association*
- *Australian Macadamia Society*
- *Australian Walnut Industry*

Association

- *Chestnut Growers of Australia*
- *Hazelnut Growers of Australia*
- *Pistachio Growers Association of*

Australia

Two representatives from each member organisation form the council.

The production of tree nuts is a rapidly growing sector of the Australian horticulture industry. Preliminary figures show domestic production of tree nuts has exceeded 44,000 tonnes and is worth more than \$126m at farm gate with a retail value of more than \$400m.

Australian tree nut production is expanding at a rate greater than 10 per cent per annum. Production is expected to increase 50 per cent over the next five years as existing non-bearing trees reach production.

The rate of tree planting in the almond, macadamia, pecan and walnut industries will more than double existing production within the next ten years.

Australia is a net exporter of almonds, macadamias and pecans. We are totally self-sufficient with regard to chestnuts and can supply around 50 per cent of the market demand for pistachios. While most walnuts are currently imported, new plantings are expected to result in the development of an Australian walnut export market within a decade. Australia is home to small domestic

hazel and cashew nut growing industries, leaving only the Brazil nut a 100 per cent import.

Strategic direction of ANIC

ANIC is in the process of finalising its strategic plan, which will be available in early 2004.

The council does not have large resources to undertake significant across industry initiatives, rather it operates to facilitate synergies and opportunities across the Australian tree nut industries.

This report provides an overview of the ANIC initiatives with Horticulture Australia, and also a snapshot of the individual tree nut industry programs and the Nuts for Health initiative.

The two key initiatives of ANIC are the Australian Nutgrower magazine and the biennial ANIC conference.

Australian Nutgrower magazine is a widely recognised and read industry publication. It is published quarterly — in March, June, September and December — and contains nut industry news, research summaries, interviews and updates on overseas research.

Subscribers to Australian Nutgrower total around 1000. These include nut growers, processors, wholesalers, food manufacturers, nut tree nurseries and research workers.

The magazine aims to provide information about products and services that can help its readership protect their crops from pests and diseases, produce better nuts and process nuts more efficiently.

As the Australian tree nut industry continues to grow with new, more intensely planted orchards being established each year, the role of Australian Nutgrower is becoming more important.

Growers and processors rely on it for updates on the latest technology and industry trends, plus information about the latest products and services available.

As well as a range of research summaries, each issue features a seasonal topic such as disease control or pruning, to keep subscribers

up-to-date with the latest techniques and informed about available products and services. It also gives manufacturers and suppliers the opportunity to advertise products relevant to the topic.

To arrange a subscription, please email the secretary at anic@riverland.net.au. For more information, visit the ANIC website at www.nutindustry.org.au.

Australian Nut Industry Council: A1057.

Australian Nutgrower: A1058.

[Countryman Horticulture / 2004 Feb 5]

Biodynamic farm succeeds with CSA approach

Carmel Bainbridge has bridged the gap between producers and consumers through the Community Supported Agriculture (CSA) scheme on her biodynamic farm in Armadale.

The scheme works like a barter system, where consumers, or members of the community, use labour and financial means to support the farm in return for fresh produce.

CSA adviser Robert Pekin said the scheme had proved popular overseas, with farms in the US supplying more than 500 families in exchange for their support.

"So far I've set up five farms around Australia but Carmel's is the only one in WA," Mr Pekin said.

As a recovered cancer patient, Ms Bainbridge decided to leave her inner-city life to start a newer, healthier one, living off the biodynamic produce

grown on her property, Mimsbrook Farm.

"With the lovely soil here we got so fired up about growing things," she said. "But



Carmel Bainbridge's biodynamic farm at Armadale bridges the gap between growers and consumers

because we are biodynamic, it's very intensive and it's hard to cover costs on labour and other things."

Ms Bainbridge also found it difficult to be competitive when it came to selling her produce at local growers' markets.

"There would always be stalls selling the same things and often the fruit sits there for a while and it's not so fresh," she said.

With the scheme, Ms Bainbridge is able to sustain the farm, while supplying about 30 people with fresh herbs, citrus fruit and vegetables on a weekly basis.

"We've formed a core group of 10 people who decide what's going to be produced and

then people pay a little up-front to buy feed and pay labour," she said.

Mr Pekin said farming in this way had proved popular because people knew where their food was coming from and had some input as to how it was grown.

"In Australia farmers are often very conservative about their farming operations and suggestions might not be taken to well," he said.

"But with CSA, consumers get to know the farmer and it's a great way of lowering costs on really good produce."

— Sarah Johnston

Jackfruit growing well in Perth

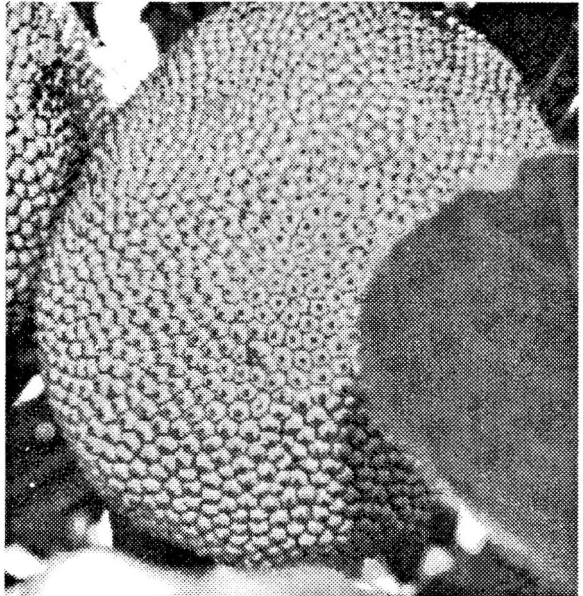
Jackfruit are one of the sights of the tropics. They are the largest tree fruit known, reaching a massive 35 kg on occasions. No wonder they often grow on the trunk, the only place able to support such weights.

I used to wonder whether they would grow in Perth, with its warm temperate/subtropical climate. Seeds from fresh fruit germinated fairly readily, though I found the seedlings a bit cold-sensitive.

In 2002, Phil Ciminata alerted me to a jackfruit tree growing in North Perth. It was apparently still young, about 2 m high and growing in someone's front yard.

Excitingly, a young female fruit was already forming (jackfruits have male and female flowers separate on the same tree).

I went back in February this year, and the tree was doing very well. It was about 3 m tall, bushy and vigorous, and had around 8 large



This Jackfruit is close to harvest time



*Fruits hanging on the Jackfruit (*Artocarpus integrifolia*) tree in North Perth*

fruits close to harvesting size (I guessed about 2-3 kg each).

So jackfruits can definitely be grown here! I don't know whether the tree pictured was a variety or a seedling, the flavours of the general run of fruits are said to vary from excellent to poor.

— David Noel

¥

Hazelnut Varieties

Hazelbrook Nut Farm, Balingup WA
(Members of WANATCA)
PO Box 15, Subiaco WA 6008
Phone 08-9388 1121 (after hours).

[Countryman Horticulture / 2004 Feb 5]

Avocado growers restructure industry

The Australian avocado industry, under the auspices of the Australian Avocado Growers Federation (AAGF), has become a public company limited by guarantee.

The new company, Avocados Australia Ltd (AAL), is now the peak industry body for avocados after extensive meetings were held throughout the main avocado growing regions of Australia.

At the meetings, growers strongly supported the move.

An interim board will continue to manage the business of the organisation until the first democratic election is finalised in June.

Grower members will directly elect the board which is set at a maximum of 10.

Interim AAL chairman Rod Dalton said the new structure would provide a much higher level of accountability to grower members than was possible under the previous arrangements.

AAL spokesman Antony Allen said the membership drive was going well.

"We sent 1300 membership forms out to growers across the country and have started to get them back already," he said.

"The move to AAL has been very well received by growers because it makes the entire system more transparent and simplifies things, it also brings us into the 21st century."

The board's election process will be based on production percentage whereby one director will represent between 15 and 17 per cent of total production, with WA having guaranteed representation on the board.

¥

[Post / 2004 Mar 13]

DIY olives in the suburbs

It's going to be a bumper year for olives and they're ripening rapidly on trees throughout the western suburbs. They will be ready to harvest in the next couple of months.

That's when Stanley Parkinson will head off on his annual olive-picking adventure.

Stanley, who is president of the WA Nut and Tree Crop Association, has an olive tree in his Nedlands back garden, but it is not bearing fruit yet.

Instead he takes a bucket and a long stick to forage in his "secret" grove on the banks of the river in Nedlands.

Stanley believes these olive trees were planted by the Gallop family when they ran a farm on the Nedlands foreshore from Gallop House.

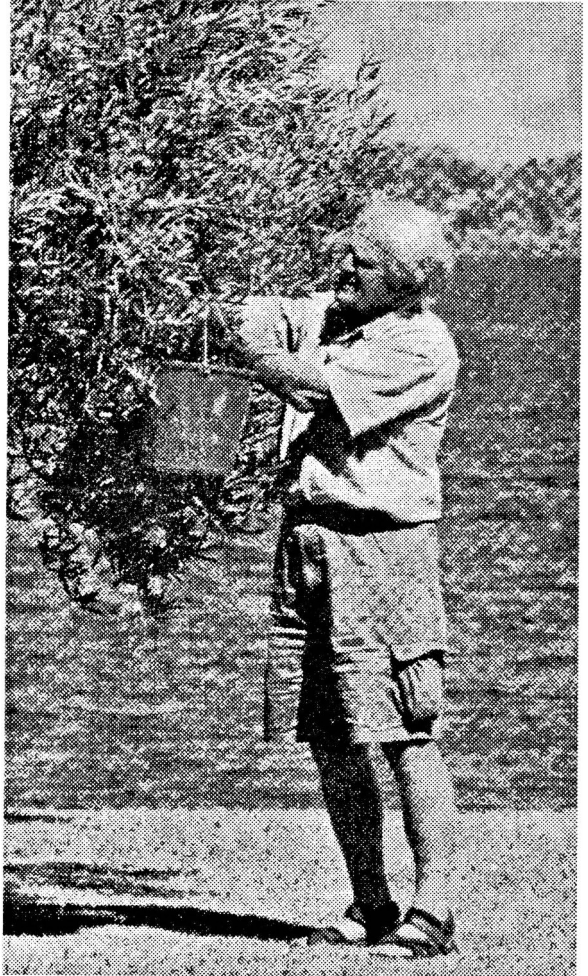
He discovered the olive grove a couple of years ago and said this year's crop looked better than ever.

"They need to be slightly squishy when you pick them," Stanley said. "There's no point picking them before then.

"I pick enough to make three big jars of pickled olives using a recipe I got from my neighbour."

Stanley's grove is just one of many places where locals can pick olives if they aren't lucky enough to have a tree of their own.

"Public" trees can be found on the Dalkeith foreshore, Dom Serra Grove in Daglish, in the streets of Subi Centro, on City Beach Oval, and the corner of St Columba's and Gregory



Stanley Parkinson checks if the olives on the Nedlands foreshore are ripe

Street, Wembley.

The best method for picking olives by hand is to pluck them directly from the branches. If they are too high people often use

a long stick to shake them off on to a sheet.

Fresh olives are too bitter to eat and there are various methods of making them less acidic and then preserving them.

Once pickled, they can then be eaten whole or crushed to make a paste or tapenade.

If you want to make your own olive oil from fresh olives, one option is a UWA Extension excursion, which on May 15 will head out to groves at Gingin to pick olives, for pickling or pressing, and learn about olive oil production.

After a picking session and a picnic the group will adjourn to Ioppolo Oils in Wanneroo to get their olives pressed.

"You tend to get a better result if the olives are pressed soon after they're picked," said Emma Mulcahy of UWA Extension. She said the minimum pressing at Ioppolo Oils was 250 kg.

"One person working really hard could pick 150 kg on the day, but I expect most people will just pick 40 to 50 kg and then relax for a picnic," she said. That would yield about five to eight litres of oil.

— *Judy Ewing*

[Don't forget the WANATCA Field Day at York Olives, Sunday May 23, to see olives grown and processed].

Putting back tree-based ecologies after mining

One of the areas where Australia has led the world is in its insistence that areas subjected to mining (resource extraction) be restored to close to their original condition after extraction is finished.

In WA, mining companies have been quite good in observing this obligation, but one company, the alumina producer Alcoa, has been outstanding in its commitment.

Alcoa mines the aluminium ore, bauxite, at locations in the Darling Ranges running parallel to the coast east and southeast of Perth.

Many of these locations are in State Forests, containing good stands of native timbers such as Jarrah (*Eucalyptus marginata*), a fine mahogany-like and termite-resistant timber valued for construction work and especially for furniture.

Alcoa are now widely appreciated for providing the most comprehensive and detailed restoration of mined sites back to their original biological condition. Not only are all the original plant species replaced,

mostly through seeding, but other organisms dependent on such things as accumulated leaf litter are also also replaced during the restoration cycle.

All this work will be described at the next general meeting of WANATCA, the West Australian Nut & Tree Crop Association, when Dr John Koch of Alcoa will be presenting a talk "Precision Restoration of Tree-Based Ecologies After Mining".

The talk will be at the Kings Park headquarters in Fraser Avenue, West Perth, starting at 7:30 pm on Tuesday May 18. The meeting is open to all and free of charge. Enquiries can be made to WANATCA's Main Agent, Men of The Trees, on 9250 1888.

Dr John Koch can be contacted at phone: 9316 5270, email john.koch@alcoa.com.au.

[Australian & New Zealand Olivegrower & Processor / 2004 Feb]

Sustainable agriculture powered by olives

Olive trees to combat soil salinity, and organically certified compost as fertiliser, are among the sustainable practices being employed in Western Australia's olive industry.

Much of Western Australia's wheat belt underlain by salty water at depths of as little as 1.2 m, making it essential to keep the water table from rising. Trees do this admirably, but nearly 85 percent of the country has been cleared. So, more trees are needed.

Paul Green's grandfather took up land in Hyden in 1928. Their farm is 340 km east of Perth and averages only 337 mm of rainfall. But in 2002 the recorded only 159 mm.

Until recently farmers had to clear almost all the property as a condition of purchase.

"Much of the country should never have been cleared, but as late as the 1980s we were getting letters saying we had to clear the land or lose it," explained Paul.

"We needed to plant more trees, so we thought we might as well get a return by planting olives rather than more eucalypts," he said. "If it doesn't work the sheep will eat them."

Since 1996 Paul, and his father George Green, have planted more than 7,000 olive trees on uncroppable areas of their wheat and sheep property.

The Greens now have several producing groves. Their first experimental crush took place in 2002.

Not content with just producing oil, the Greens are setting up a 20-seat restaurant on the property, aiming to feed locals and individual tourists with home-made pasta and olive products. Paul is even planning to grow his own durum wheat.

"We are using a traditional cold press",



Paul Green inspecting young olive trees on uncroppable areas of his wheat and sheep property

said Paul. "But it's stainless steel as the Public Health Department won't let us use stone.

Much of the hilltop land is not croppable due to large ironstone boulders. The Greens have chosen to revegetate these areas with olives rather than the original native flora.

Other parts of the farm planted with olives include crabhole country and acid sands.

"Land where you would struggle to get a crop," said Paul.

Their first grove was irrigated from a hillside salt seepage which was spreading over lower slopes and creating a salt patch.

The water contains 7800 ppm of salt. Paul claims that olives can grow in water with as much as 28,000 ppm of salt.

A windmill pumps out around 20,000 litres per day through 5 km of polythene pipe.

"It's not quite enough water, but very few of the 7000 trees on the property have died", he said.

George has taken up olive propagation in



Andy Gulliver (left) and David Cullen saw an opening in the shortage of compost among olive growers

his retirement, grafting new varieties on to wild rootstock grown from seed. After initial failure he has now achieved a 50 percent take.

To help with harvest, they have chosen olive varieties with a staggered flowering time. The trees are planted at 6 x 8 m spacings ready for mechanical harvesting.

Grazing by kangaroos is the main pest problem, but Paul has found that a simple electric fence will keep them out. Later he plans to graze sheep under the mature trees, mainly to keep down the grass which becomes a fire hazard in summer. "That's the biggest danger round here," he said.

Before planting, the soil is deep ripped and lime added to raise the pH. Trees are given superphosphate with trace elements and compost. The Greens make their own compost, mainly from pea and lupin straw. Olive prunings are used for mulch.

"There's a big difference where we used compost. But we can't make enough for all trees," he said.

Shortage of compost is a common problem amongst WA olive growers; one David Cullen and Andy Gulliver are doing their best to solve.

They set up Custom Composts six years ago on leased land next to Wandalup Farms,

Mandurah, one of WA's largest piggeries.

Their first enterprise consisted of producing 300 tonnes/week of compost for the mushroom industry based on straw, poultry manure, gypsum, peat and limestone and utilising waste water from the piggery.

They also receive community green waste from local councils for processing into mulch.

From this they progressed to using the spent mushroom compost to produce both mulch and compost for the horticultural industry, incorporating more straw, pig manure and sawdust.

Andy said one aim was to make the piggery 100 percent self contained.

"We aim for no off-site impact," he said. Everything from dead pigs to straw bedded pig manure is composted and recycled.

Custom Composts provide a consultancy service to help growers recycle all organic materials and prevent pollution by waste from the olive processing industry.

— *Frank Smith*

(Frank Smith is a Western Australia-based freelance journalist who specialises in agriculture).

Australian & New Zealand Olivegrower & Processor: A3140.

[Australian & New Zealand Olivegrower & Processor / 2004 Mar-Apr]

2004 National Olive Industry Conference, Perth, WA

Plans for the Australian Olive Association's National Olive Conference, to be hosted by the Moore River Olive Association in Perth next October 27-31,

A new conference format

The 4-day program has workshops, a full day visit to a grove in the Moore River Region plus the Food Lovers Festival and luncheon.

DAY	AM	LUNCH	PM	EVENING
Wednesday 27 October 2004	Plenary Sessions	Stand-up Lunch	Workshop Streams	Sponsored Welcome Cocktail Party
Thursday 28 October 2004	Field Demonstration Day At Fini Olives Grove Gingin (Exhibitors Set Up During Day)			Free Evening
Friday 29 October 2004	Plenary Sessions	Exhibition/Lunch (2 hours)	AOA AGM	Sponsored Cocktail Function Restaurant Dine Around Options
Saturday 30 October 2004	Workshop Streams	Exhibition/Lunch (2 hours)	Plenary Sessions (4pm concludes)	Sponsored Gala Awards Dinner
Sunday 31 October 2004	Food Lovers Festival & Luncheon (event to be scoped and confirmed)			

For more details about the conference call Jackie Shervington 0419 045 783 or contact her via email at info@mooreriverolive.asn.au or.

are well under way with a major industry sponsor already signed up.

Conference organisers have snared their first gold sponsor for the event, Perialisi, which has also arranged for a keynote speaker,

Prof Bernardo De Gennaro. His topic will be "Olive Oil Processing Technologies and Subproducts (waste products) Handling: economics and environmental aspects and issues".

Prof. Bernardo De Gennaro was born in Molfetta, Italy in 1959. He graduated in March 1983 in Agronomy at the University of Bari. In 1990 he gained a doctorate in Agriculture Economy and Politics at the University of Napoli, where he is Professor of Economy and Rural Valuation.

For over 20 years he has studied the economics and environmental issues of agro-food processing, in particular those related to the olive oil industry. He has paid particular attention to issues concerning organic olive growing and has organised an international centre which collects and disseminates information and studies concerning the economics issues of the olive oil industry, and in particular those of organic olives and olive oil.

Australian & New Zealand Olivegrower & Processor: A3140. ¥

MACADAMIA TREES

Grafted, top quality trees from the Eastern States. Health-inspected by two state Agriculture Departments. More than 20 varieties available including all the top performing and newer varieties such as 816, 842, 849, A4, A16, A38, 781, 783, and Daddow etc.

Competitive prices reducing with larger orders.

**Pemberton Macadamias <A3260>
Iain Rankin, Ph/Fax 08-9776 1046 or
Margaret River Tree Planting and
Landcare Services <A3259>**

David Rankin, Ph/Fax 08-9757 2547
PO Box 217 Margaret River 6285

Green sapote roundup

Of all the fruits called Sapotes (a general central american term for sweet fruits), the Green Sapote is probably the least commonly found in plantings outside its native area. Yet many say it is one of the better sapotaceous fruits. Here we present a collection of extracts in an attempt to improve general appreciation and usage of the fruit.

[Sub-Tropical Fruit Club of Old. Inc / 2004 Feb-Mar]

Green Sapote

Green Sapote (*Pouteria viridis*) (syn *Calocarpum Viride*) is in the family Sapotaceae. It is a close relative of the Mamey Sapote (*Pouteria sapota*) and related to other species in the Sapotaceae family including star apple, sapodilla, abiu, canistel, lucuma and miracle fruit. The name sapote comes from tzapotl which is a general term for all soft sweet fruits

The tree is an evergreen, medium to large tree 6-24m tall with alternate leaves 10-20cm long clustered at tips of branches, prominent veins, milky sap. It has smaller darker green leaves than the mamey. Flowers are about 12 mm across, inconspicuous pink to white. It is usually propagated by seed but grafts can be made onto mamey sapote stock. The grafted trees may fruit in 3-5 years, seedlings will take 8-10 years. The tree likes warm humid

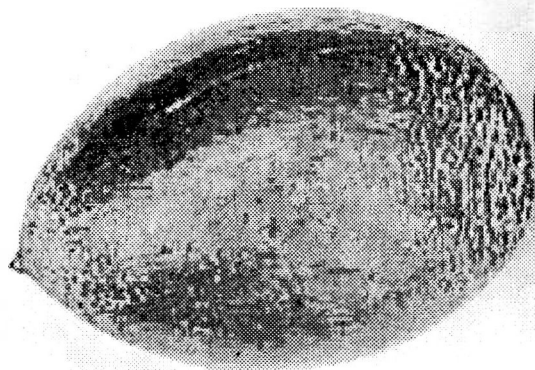
conditions and has a low tolerance to frost. It is a native to the highlands of Central America where it grows in volcanic soil.

Kasper Schnyder says there are very few green sapotes left and for this reason there is little information available about them. He has grown green sapotes and mamey sapotes side by side. The mamey is a much taller tree and the green sapote can grow underneath it.

He recommends well drained ridges as trees do not like flooding. From his experience he finds the trees grow better from seed as grafted trees get fungi at the graft. He has tried grafting onto mamey stock and also air layering but believes growing from seed is the most successful, resulting in good trees which bear successfully.

Phytophthora is the only disease he has experienced with his trees — a similar problem to that with avocados. He says there are no specific cultivars as such, though seeds from different trees give different shaped fruit, some more pointy, some more round. His seedlings take 6-7 years to bear. (In the US green sapote trees are grafted on mamey sapote and bear in 3-5 years).

He mulches them well with sugarcane mulch when they are small and then provides plenty of manure as they grow. He thinks good mulching helps protect them from occasional light frosts but warns they don't like



The Green Sapote, Pouteria viridis

temperatures below -1 C. He believes trees are capable of being placed in full sun after 6 months (in Western Australia, Greg Woolley believes he needs to give sun protection for at least 2 years: Greg has managed to kill 3 young trees, he thinks from over fertilizing with heaps of grass mulch and from a problem with "slaters" which eat the bark of the young trees which weakens and can kill the tree).

The fruit is oval to round, 50-75 mm x 75-125 mm inches. It takes 6-8 months from bloom to maturity and is harvested in Oct-Dec. Kasper believes the fruit is superior to the mamey sapote, and it bears annually where the mamey takes 14-20 months to produce each crop. The dull dark green fruit softens and turns to gold when ripe and the thick orange flesh has a "melting in your mouth" effect.

The fruit is slightly smaller in size than the mamey and has a superior flavour and finer texture. It is mature with the first colour break, can be picked hard and will ripen off the tree. Daley's Nursery states that the 1-2 rather large seeds are edible in the fruit when roasted and have been used as an adulterant to chocolate. It is usually eaten fresh out of hand but the pulp can be made into desserts and preserves.

— *Judy Walker*

References

- www.daleysfruit.com.au
 www.tradewindsfruit.com
 www.tropicalfruitnursery.com.
The Complete Book of Fruit Growing in Australia by Louis Glowinski.
 Greg Woolley, rarefruit@yahoo.com.
 www.hort.purdue.edu/newcrop/morton/sapote_ars.html
Mamey sapote only: http://edis.ifas.ufl.edu/BODY_MG331
<http://gears.tuscon.ars.ag.gov/book/chap9/mamey.html>.

The following extract is from the web version of the text of Julia Morton's monumental and comprehensive book, "Fruits of Warm Climates".

http://www.hort.purdue.edu/newcrop/morton/sapote_ars.html

Green Sapote

(extracts only, see web page for more detail)

The green sapote, *Pouteria viridis* Cronq., (syns. *Calocarpum viride* Pitt.; *Achradelphia viridis* O.F. Cook), is called injerto, injerto verde or raxtul in Guatemala; zapote injerto in Costa Rica; white faisán or red faisán in Belize.

The tree is erect, to 12-24 m in height, its young branches densely brown-hairy. It possesses an abundance of white, gummy latex. The leaves are clustered at the tips of flowering branches and irregularly alternate along non-fruiting limbs.

Flowers, borne in groups of 2 to 5 in the leaf axils and massed along leafless branches, are tubular, 5-lobed, pinkish or ivory and silky-hairy. The fruit varies from nearly round to ovoid, pointed at the apex and sometimes at the base; may be 9-12.5 cm long and 6.25-7.5 cm thick, with thin, olive-green or yellow-green skin dotted with red-brown and clinging tightly to the flesh.

The flesh is light-russet, of fine texture, melting, fairly juicy and sweet; of better flavour than the sapote. There may be 1 or 2 dark-brown, shiny, elliptic or ovate seeds to 5 cm long, with a large, dull, greyish hilum on one surface. The fruit is picked while hard and held until soft. The flesh is generally eaten raw, spooned from the skin, but a preserve is made from it in Guatemala.

The tree is native and common in the wild

in Guatemala and Honduras; rarer in Costa Rica and southward to Panama; at elevations between 900 and 2,100 m. The fruits are commonly marketed.

The tree seems to flourish with little care on rich hammock soil but needs regular fertilizing on limestone. The Cuban May beetle feeds on the leaves. Seedlings begin to bear when 8 to 10 years old. The crop ripens in fall and winter.



Food Value Per 100 g of Edible Portion*

Moisture	68.1-69.5 g
Protein	0.152-0.283 g
Fat	0.24-0.28 g
Fibre	1.2-1.6 g
Ash	0.69-1.38 g
Calcium	18.6-35.7 mg
Phosphorus	22.1-23.6 mg
Iron	0.57-0.74 mg
Carotene	0.031-0.069 mg
Thiamine	0.009-0.011 mg
Riboflavin	0.027 mg
Niacin	1.88-1.189 mg
Ascorbic Acid	49.9-62.3 mg

*Analyses made in Guatemala.

The latex (chicle) has been commercially collected and marketed like that from the sapodilla for use in chewing gum. The wood is reddish, fine-grained, compact, strong, durable; occasionally used in construction, carpentry, turnery, and for furniture and panelling in Guatemala.

One of the early fruit enthusiasts to work on Green Sapote was Wilson Popenoe, who imported seeds to the USA, and described the fruit in his classic 1920 book "Manual of Tropical and Subtropical Fruits", from which the description following is taken. Popenoe's book is notable for the fact that a reprint edition was made more than 50 years later, in 1974, and Popenoe himself wrote the introduction to that, too!

The Green Sapote

(*Calocarpum viride*, Pittier)

While greatly superior in flavour to its congener the sapote (*C. mammosum*), the green sapote is much more limited in its distribution. It is common in the Guatemalan highlands and is found also in Honduras and (rarely) in Costa Rica. Elsewhere it is not known, but it deserves to be cultivated throughout the tropics.

In habit and general appearance the tree greatly resembles the sapote, from which it can be distinguished (according to Pittier) 'by

the smaller leaves, downy and white beneath, the smaller and differently shaped sepals, the shorter staminodes and stamens, the latter with broadly ovate anthers, and above all the comparatively small, green, and thin-skinned fruit and the smaller, ovate seed.'

It is most abundant in northern Guatemala (the Alta Verapaz), where it grows usually at elevations of 4000 to 6000 feet. Unlike its relative the sapote, it does not thrive in the hot lowlands. The lower limit of its cultivation is approximately :3000 feet, the upper between 6000 and 7000 feet.

The fruit, which is known in Guatemala as injerto (Spanish) and yash-tul (Kekchi, green sapote), is much prized by the Indians of the Verapaz. The flavour is similar to that of the sapote, but more delicate, and the flesh is finer and smoother in texture. The largest fruits are nearly 5 inches long, turbinate to elliptic in outline, and brownish green to pale yellowish green in colour; the skin thin, almost membranous, and easily broken. The flesh is pale red-brown in colour, melting, sweet, and somewhat juicy. The seeds are commonly one or two, elliptic in form, and about 2 inches long. Usually the fruit is eaten fresh, but in some parts of Guatemala a preserve is prepared from it, similar to that made from the sapote.

The tree is productive, but has the disadvantage of not coming into bearing earlier than eight or ten years from seed. It is not systematically cultivated, but is met with in dooryards and around cultivated fields. The fruits are in great demand in the markets of Guatemalan towns. They ripen from October or November (depending on elevation) to February. When picked from the tree they are hard and can be carried long distances without injury, but after they have softened and are ready for eating they must be handled carefully,

since the skin is thin and easily broken.

This species has been planted recently in California and Florida. It is more likely to succeed in the latter state than the sapote, since it is somewhat more frost-resistant. It is doubtful, however, whether it will survive temperatures below 27° or 28° above zero (F). Seed-propagation is the only method which has been employed up to the present time.

Finally, for the most complete and comprehensive modern information on Green Sapote, you need to consult the massive (770 page) book by the world authority on Sapotaceae plants, Dr T D Pennington. It is entitled simply 'Sapotaceae' and is in the Flora Neotropica series published by the New York Botanical Gardens (1990). The cover illustration to this issue of 'Quandong' is sourced from this book. A few extracts are given here.

Pouteria viridis

154. *Pouteria viridis* (Pittier) Cronquist, Lloydia 9: 290, 1946.

Calocarpum viride Pittier, Contr. U.S. Natl. Herb. 18: 84, pl. 52-54.1914. Type. Guatemala. AltaVerapaz: Coban, Aug 1910 (fl), Cook 214 (holotype, US; isotypes, frag. F, US). *Achradelphia viridis* (Pittier) O. F. Cook, U.S. Agric. Bur. P1. Indust. Invent. 36, Seeds & P1. Imported 10, 69. 1915.

Tree; young shoots densely brown-pubescent to tomentose, becoming glabrous, greyish, rough, often lenticellate. Leaves densely clustered, spirally arranged, 9.7-20 (-26) x 3.5-8(-10) cm, oblanceolate....

Distribution. SE Mexico, Guatemala,

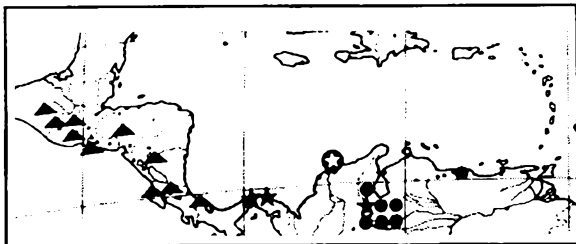
Honduras to Costa Rica. Most Guatemalan material is recorded from montane forest about 1000-1500 m altitude, but in Nicaragua and Costa Rica it occurs commonly in lowland wet forest and 100-200 m altitude.

Field characters. Tree to 30 m high and 75 cm diam., larger specimens buttressed to 1.5 m high, bole sometimes fluted at base; bark buff or greyish, scaling in small rectangular pieces or finely fissured; branches spreading widely, often whorled in younger specimens; slash pinkish, smelling strongly of almonds, with a small amount of white sap. Flowers strongly scented, cream or greenish, fruit remaining green, smooth or sometimes partially or completely covered with large brown lenticels, flesh pale greenish-brown to orange-brown, smelling of almonds, flowering mostly Jan-May, mature fruit recorded Jan-Mar, Oct-Nov.

Local names and uses. Chulul (Mexico); ingerto, injerto, yash-tul (Guatemala); zapote (El Salvador); zapote blanco (Costa Rica: Guanacaste); zapote ingerto (El Salvador); zapote mico (Nicaragua).

The edible fruit is reputed to have a finer and more delicate flavour than that of *P. sapota* (Popenoe, 1920: 343) and it is commonly cultivated in the Guatemalan highlands, Honduras and lowland Costa Rica.

Relationships. A comparison of *P. viridis* with *P. sapota* and *P. fossicola* is shown under *P. sapota*. *Pouteria viridis* can usually be distinguished in the herbarium by its densely hairy leaves, and in the field by the smooth, green fruit. However, both species are widely cultivated and intermediate forms are found among planted trees (e.g., Pennington & Poveda 11473, Costa Rica).



The distribution of some occurrences of *Pouteria viridis* (triangle symbols)

[<http://lists.ibiblio.org/pipermail/nafex/2004-March/007622.html>]

The Fruit Is Uncommon, but the Care Is Not

There is a new book by Lee Reich, recommended as the best available on rare temperate fruits. Lee says:

"My new book Uncommon Fruits For Every Garden (Timber Press) will be out in a couple of weeks. It's a sequel to my first book, with new fruits, color photos, new information, and updated nursery sources. Signed copies are available from me at 387 Springtown Rd., New Paltz, NY 12561 for \$27, which includes shipping". (Lee Reich's email is springtown@netstep.net)

The website article describes a fruit called Shipova:

"Consider, for example, an obscure fruit called the shipova (X Sorbopyrus auricularis). This hybrid of pear and mountain ash can be traced to a plant growing on the grounds of the Museum of Natural History in Paris in 1834."

The article also describes medlar (*Mespilus germanica*), maypop (*Passiflora incarnata*), and lingonberry (*Vaccinium vitis-idaea*).

West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

EXECUTIVE COMMITTEE 2004

Stanley Parkinson (President)	9386 2518	John Cory	9574 6163
John Foote (Vice-President)	9682 1060	Wayne Geddes	0412-075 043 9382 2437
Trevor Best (Treasurer)	9397 5920	Bill Napier	0417-176 458 9397 6799
George Ainsley	9390 5338	David Noël (Publications)	9381 7341
Bob Cook (Events)	9574 7103/h	Charles Peaty	0439-996 662 9433 4442

ACTION GROUP LEADERS

CHERRY: Neville Shorter, 9450 5606 (2/9 Clydesdale St Como 6152)

FIG: Alex Hart, 9490 1324 (71 Terence St Gosnells 6110)

JUJUBE: Jim Dawson, 9574 6371 (PO Gidgegannup 6083)

MACADAMIA: John Cory, 9574 6163 (Toodyay Rd Gidgegannup 6083)

PECAN: Bernie Rochester, 9734 1309 (90 Bucktin St Collie 6225)

PISTACHIO: Bert Hayes, 9622 9513 (PO Box 429 Northam 6401)

PITAYA: Bob Naderpelt, 9375 9435 (PO Box 56 Morley 6943)

POMEGRANATE: Julie Firth, 99381628 (Lot 12 David Rd Waggrakine 6530)

WALNUT: Graham Fellows, 97731346 (PO Box 217 Manjimup WA 6258)

CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: Jul 20, 2004

- 2004
- May 18 Tue * Wanatca General Meeting: Dr John Koch, Alcoa - "Precision Restoration of Tree-Based Ecologies After Mining". (Kings Park)
- May 23 Sun * Wanatca Field Day, York -York Olive Co
- Jun 14-18 § 6th International Congress on Hazelnut, Tarragona, Spain.
- Jul 6 Tue Wanatca Executive Committee Meeting
- Aug 17 Tue * Wanatca General Meeting
- Aug 24-26 • Dowerin Agricultural Field Days
- Sep 18 Sat • Karragullen Horticultural Field Day
- Sep 20-24 § Acotanc-2004, Gatton, Queensland
(www.newcrops.uq.edu.au/nc2004)
- Nov 16 Tue * Wanatca General Meeting

*General Meetings are held starting at 7.30pm. *Venue: As noted in each case.*

These meetings usually include a display of current world tree-crop magazines for sale.

• Event with WANATCA participation; § Refer to news item in this issue of *Quandong*.

Material originating in Quandong may be reprinted; acknowledgement of author and source requested.

Current Subscription Rate: \$60.00 per year

(includes all publications for four consecutive quarters). Student Rate: \$30.00

Quandong is produced by the Tree Crops Centre. PO Box 27, Subiaco. WA 6008. Phone: 08-9381 7341. This issue edited by David Noel. WANATCA contacts: Phone 08-9250 1888. Fax: 08-9250 2735. E-mail: <office@aoi.com.au>. Websites: <www.aoi.com.au>.

Quandong Advertising Rates: Whole page, \$100; Half page, \$60;

Quarter page, \$35; Eighth page, \$20. 20% discount for 4 insertions.