

Quandong

magazine of the

East Australian Nut & Tree Crop Association (Inc)

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THE AVELLANO OR CHILE HAZEL (*Gevuina avellana*)

From 'Alternative Foods' by James Sholto Douglas

NEXT MEETING

We expect to have two speakers at the next General Meeting, which will be held at the Naturalists' Hall, 63 Meriwa Street, Nedlands. Time:

Wednesday May 18 at 7.30 pm

The first speaker will be Des Gilbey of the West Australian Department of Agriculture. Des will be talking on

WEED CONTROL IN ORCHARDS

Des will be followed by well-known horticulturist, author, and broadcaster Neville Passmore, who will be talking on

FRUITS OF THAILAND

Neville, one of the most prominent WANATCA members, specializes in exotic and unusual fruits and nuts, and runs Blossoms Nursery in Gosnells, a good place to look for both traditional and unusual fruit trees.

The meeting will be OPEN TO THE PUBLIC (free admission), why not ask a friend along if they are interested in tree crops?

FIELD DAY

Our next Field Day will be at the Machlin Farm on Lennards Road, Gingin, on
Sunday May 22 at 12 noon

For further details, consult the liftout with this issue of Quandong, or contact the Tree Crops Centre.

New Vice-President for WANATCA

At the last Executive Committee meeting, Milan Mirkovic was elected to the position of Vice-President, to fill the vacancy left by the death of Reg Judd.

Congratulations, Milan, and thank you.

BUNYA PINES AVAILABLE

A number of Bunya Pines, *Araucaria bidwilli*, are to be cleared shortly from the Perth Zoo. They are about 4-5 feet tall. This tree produces excellent nuts in huge cones.

If you want some of these trees contact David Hannell quickly on 09-367 7988.

New ACTION GROUPS to be Formed

At the last Executive Meeting of WANATCA, it was decided to set up a number of Action Groups to help the development of particular tree crops. Each will have a Chairman who will co-ordinate the actions of the Group.

The first one will be the Pistachio Action Group (PISTAG), which will be headed by Tom Bateman (contact details on back page of Quandong).

Each Action Group will operate with some measure of autonomy, although close liason between each Action Group and the main Executive will be essential. The Executive will channel information received from outside to relevant Action Groups, and the Action Groups will produce information for the group and for general members.

Quandong will carry Action Group Bulletins with this information, either in the body of the magazine or as liftout supplements. The first PISTAG BULLETIN is printed in this issue of Quandong, and includes an exciting offer of Pistachio vera trees grown from seed imported from Syria.

The Action Group concept was developed by the New Zealand Tree Crops Association, with considerable success. It recognizes that while potential members see the benefit of belonging to a comprehensive 'umbrella' organization, many of them are vitally interested in one particular tree crop, and if this receives little general attention they may move out and form a separate specialist organization; this lacks the benefits of size, national influence, financial stability, and cross-fertilization inherent in the larger group.

If you interested in running or taking part in a WANATCA Action Group, or have useful suggestions for one, let us hear from you.

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Feijoas in the Garden

The feijoa or pineapple guava (*Feijoa sellowiana*) is a native of South America. It is an evergreen tree growing up to 4 metres high, with a spreading habit and attractive red flowers that make it useful as an ornamental.

The oval fruits, which are about the size of a passionfruit, are green-skinned with white to grey flesh and a strong odour. They can be eaten fresh, juiced, preserved or made into jams. The ripe fruit is rich in vitamin C.

Varieties

There are two varieties suitable for New South Wales. Mammoth has large fruits with good flavour, is self-fertile and usually bears a good crop. Triumph has similar quality fruits that mature later; cross pollination with Mammoth is necessary for a good crop.

Seedling feijoas are variable and should not be grown.

Location

Feijoas are very hardy and will tolerate a wide range of soil types. They do best in well-drained, fertile, loamy soils that are slightly acidic. They are only mildly affected by frosts, and can be used as windbreaks.

Propagation

Feijoas can be propagated by seeds, cuttings, or grafts. Seeds germinate readily but the quality of the seedlings is variable.

Planting and Caring

Feijoas are best planted in spring, except in the northern rivers area, where autumn planting is preferred. They are drought-hardy but adequate watering in summer is essential for good fruit quality.



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Initially, contact on any matter we may be able to assist with will be through our Perth Office, telephone 09-325 5100, contact Neil Dayman (a/h 09-332 3962) or Alan Bell (a/h 09-3302074).

We look forward to hearing from you.

Nutrition

Feijoas require an application of a 10:4:6 fertilizer (e.g. citrus fertilizer) each winter before the end of August. Apply this at the rate of 500 grams per year of age until the tree is ten years old, then continue to apply at the ten year rate. Spread the fertilizer evenly around the tree but do not let it accumulate around the trunk.

Pruning

Young plants require little pruning: cut them back to a single leader (main branch) at planting time and remove any suckers or low growths that appear. Prune bearing trees only to reduce the number of laterals (minor branches) in the centre and to encourage new growths.

Pruning Hints

- If you are pruning to encourage new growth, make cuts just above an outward pointing bud or shoot.
- Cut out all dead or diseased material; don't leave stubs.
- Remove crowded or crossed branches.
- Paint cuts larger than 2 m across with a bituminous wound dressing.

Harvesting

Grafted feijoa trees begin producing worth-

while crops in their third and fourth year. The fruit ripens in March/April and remains firm and on the tree until it falls. Do not pick the fruit but let it drop, as the bruising resulting from the fall stimulates the ripening process. Although the skin of the fallen fruit may be blemished, the fruit's flavour will be better than that of fruit picked from the tree.

Problems

The main insect pests of feijoas are fruit fly, light brown apple moth and wax scales. Fruit fly is a major problem, especially in coastal areas. There are no major diseases of feijoas.

Letter from Dr Andrew Wilson, USA

I have obtained a copy of *Tree Crops: The 3rd Component, Proceedings of the First Australasian Conference on Tree and Nut Crops*. I have found this volume particularly useful in my work with tree crops, and congratulations to your Association for having this volume published.

I read that a Second and Third Australasian Conference has been held and that it is possible that the proceedings of those conferences are available. If such volumes exist I would appreciate very much information on where I could obtain a copy, in the United States preferably, or if not, in Australia. Any help you can give me in this matter would be most appreciated.

The Tree Crop project which I currently direct is doing research with agroforestry systems, with honeylocust trees planted in pastures, with the honeylocust pods to be self-harvested by sheep and cattle. If you have any bibliography regarding such systems in Australia or New Zealand, it would be most useful to us and I would appreciate receiving a copy.

Dr. Andrew Wilson, Director,
Springtree Tree Crop Project, Rt. 2,
Box 89, Scottsville, Va. 24590 USA

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Neem Tree News

Exciting news – we now have some neem trees available for distribution - see news of our Special Offer elsewhere in this 'Quandong'.

An excellent article about the big range of uses of neem appeared in Economic Botany Vol 40, p.201-9, 1986. Called 'Potential of the Neem Tree (*Azadirachta indica*) for Pest Control and Rural Development', the myriad uses being found for neem are clearly laid out.

The authors, Saleem Ahmed and Michael Grainge, describe the many medicinal uses of neem extracts. Neem oil is used for soapmaking, neem cake for cattle food, and young neem leaves are edible for humans. Timber and resin are also valuable.

But the great leap in current interest in neem stems from its use as a natural organic insecticide. The authors point out that between 24 and 55% of various important world crops are lost due to agricultural pests.

And the big bonus is that neem extracts have been found to be safe, or even beneficial, when ingested by mammals. What more could one ask? Well, another thing is ease of growth, and neem has been shown to thrive in subhumid to semi-arid warm areas with rainfall under 500 mm/yr.

In colder areas the neem may not do as well. However, its close relative, the Chinaberry, White Cedar, or Cape Lilac (*Melia azedarach*) grows freely over most of Australia, and this tree deserves serious trials also for a range of uses.

Neem Tree Offer

Quite a good proportion of the neem seeds supplied by Avril Baxter have been germinated and raised by Ian Fox of the University of WA. Some of these are now being made available for growing on around the State.

Cost is:

\$10 for 2 Neem Seedlings

This is a once-only chance to grow some of these most interesting trees.

To secure a pair, send \$10 to:
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PO Box 565, Subiaco 6008

together with your name, address, and phone number. Offer available until all trees sold. We can arrange for you to pick the trees up at the next meeting, or to be sent to you (freight forward) by the carrier you nominate.

Letter from West Germany

I got your name and address from NNGA newsletter, Vol. 40/4, Sept. 87. in which more than two pages deal with your new centre. I am a member of the NNGA as well as of the German Dendrological Society, DDG, and am certain to get my membership of the International Dendrology Society, London, (IDS), later this year. My profession is that of a chemist, with a degree from Munich University. Dendrology is a hobby of mine, i.e. I am an amateur who did not learn dendrology, but I assume, that I could learn something in that discipline. My main interests are the Juglandaceae, Sorbaceae and Fagaceae (exclusively the american white oaks). Lately I have also been interested in the Leguminosae, especially Gleditsia and Prosopis. I have no commercial interests but hope to be able to help to make some trees and their fruits more familiar to people, especially in view of their usefulness to wild-life. Though I am working for more than fifteen years with juglans and carya, and a few years ago started together with Prof. Kausch the campaign for re-introduction of *Sorbus domestica* and *Sorbus torminalis* (very successfully!!) my dealing with tree crops for wild-life is comparatively young. Last year, I obtained a pamphlet from Mr. Halliwell, Officer of the New Zealand Ministry of Agriculture and Fishery, devoted to nut tree crops. This started me on a study with the sweet fruiting american white oaks and with special kind of heavy crop bearing strains of *Gleditsia tricanthos*. Unfortunately, Halliwell died two or three years ago and his co-workers wrote me, that he took all his knowledge with him. What a pity!

After this long introduction my question to you: In the mentioned article in the news-

letter of NNGA you are quoted: "Pistachios would do very well in the wheat belt. They are extremely tolerant, known to survive a temperature range from minus 50 to plus 150 degrees Fahrenheit".

This is completely new to me and the friends of the DDG, I consulted in this matter. We know, that pistachios must have a winter period with low temperatures, followed by a hot dry summer. And we know, that some ten or fifteen degree centigrade can be tolerated, but a minus 50 degree F equals about -45° C, a temperature, we here in Germany never have had and which is perhaps the winter temperature of Middle Canada or of the colder parts of Siberia.

Please be so good as to let me know, whether you are wrongly quoted, and if not, what kind of pistachio plants you have, that are able to withstand these temperatures. A well-known dendrologist in my vicinity, Mr. Blachian, IDS-member, is the owner of an excellent arboretum and he tried some years ago to grow pistachios, esp. *Pistacia chinensis*, which is said to be the hardiest at all, but the plants failed after a winter with temperatures not lower than -15°C. This is a temperature, which we have nearly each winter (not this winter, when the lowest has been -12°C), colder winters will bring the temperature down to -30°C, as in 78/79, 84/85 and 86/87.

I was very glad to learn from your contribution something about macadamias. My wife and I love macadamias and consider them the best of all the nuts. I bought some seed from Chiltern Seeds in England and have a wonderful, now about 50 cm tall plant of *macadamia ternifolia*. All my friends of the DDG visiting me, are asking: "What is this? A new kind of *Ilex*?" Nobody has ever

seen a macadamia tree. I feel there can be a great market in Germany for the nuts, if the price will go down somewhat. Perhaps you will not believe me, when I tell you, that the market in macadamia nuts is governed by one German company and we have to pay between DM 10 and 12.— equal to 3.5 -4 Pounds Sterling for a 150 gram tin of salted macadamia nuts. I heard that the nuts in Australia are not cheap, but normally priced. Nevertheless, there still seems to be a strong shortage, and the importer can ask nearly as much as he likes.

If I am correct, you are dealing not only with nuts and pistachios, but cover all the tree crops. Perhaps you have some experi-

ence with *Gleditsia tricanthos*. We think, that this could be a good crop for wild-life, but it is extremely hard to get any information about the heavy fruiting clones. We wrote to the US Government and to a lot of authorities there, but had no response. We found the address of the Sunny Yard Nursery in Swartmoore in the US, but the nursery had closed more than ten years ago and we have not been able to find anyone who can tell us who markets these trees. Can you help?

I would be glad to hear something from you in the future.

Walter Griesmeir,
Frauenstrasse 18,
D-8930 Schwabmünchen, West Germany

[Reply from David Noel]

Thank you for your interesting letter concerning pistachios and other matters. On the main question, that of the temperature tolerance of pistachio, the figures quoted may be somewhat exaggerated, but not by much! On the matter of the minimum temperature, I enclose a photocopy of an extract from a Russian book on pistachios, the title translates as 'Bio-ecological features of pistachios in the Kirgiz Range mountains', the author is A.S.Bulychev.

The marked paragraph in the introduction runs:

"However this is not the limit of the pistachio's valuable properties. It possesses a series of valuable arboricultural properties, including marked drought resistance, ability to withstand high summer temperatures (40° C and above) and low winter ones (down to -41° C), it is long-lived, not fussy as to soils, and will grow without irrigation on steep mountain slopes"

Now -41° C is not quite as much as the -45° C equivalent to -50° F, but the -41 was an actual measured temperature, and one can accept that with normal variation some of the unmeasured temperatures would have reached -45. Also the -41 is not a misprint,

it is repeated in the body of the text, and further explanation of the conditions is given. The area concerned is the most northerly point of the pistachio's range, the elevations are high (up to 1400 m) and the area (in the Kirgiz Republic to the north of the Himalayas) is an example of a central continental location, where temperature ranges hit their most extreme.

The author mentions that the pistachio is able to withstand these cold temperatures only when it is completely dormant (as it normally would be in winter). Undoubtedly, too, the Kirgiz plants have been naturally selected to withstand low temperatures, while those we are more familiar with originated in Persia or Turkey and have never had such a harsh selection.

On the matter of maximum temperatures, the evidence is closer to home, in Australia. Because of certain features of the Earth's orbit, summers in the southern hemisphere are hotter and shorter than those at comparable latitudes in the north. In Western Australia, where the pistachio has been observed to thrive in the burning inland summers, temperatures approaching 55° C have been measured in the shade!

In Perth itself, which has a climate moderated by the sea, the temperature reached 42° C only last week, in March! Since differences of 10° C between exposed sunny positions and adjacent shady ones are not unusual, an exposed-sun temperature of 65° C, equal to 150° F, is not unreasonable. Incidentally, the Bulychev book mentioned above contains considerable detail on the leaf structures within pistachio which allows it to withstand the harsh conditions.

On the question of *Gleditsia tricanthos*, the Honey Locust, quite a lot of work has been done in Australia. I have a number of trees in my yard, one of which has grown as much as 5 m in a year. One, about 7 years

old now, has fruited for the last 3 years and is currently covered in pods. Some selections are available in Perth, but mostly of decorative clones (eg 'Sunburst', with bold golden foliage in autumn).

Selections with good heavy pods are emerging here, but are not generally available in nurseries. An article on the honey locust in Australia, by Jason Alexandra, appears in the book 'Tree Crops, the 3rd Component'. An Australian book about the honey locust has been announced, but has not yet been published.

As to macadamias, I am pleased that you like this nut so much, it is said to be the only Australian native plant which has ever been exploited as a food source. In fact Australia has a huge range of exploitable food plants – we are busy working on the rest! One of these is the Quandong, a good West Australian nut in the sandalwood family, which has edible fruit as well as an edible kernel. 'Quandong' is the name of our Association's magazine – a sample copy is enclosed.

[West Australian, 30 December 1987]

Sandalwood tree trials start in Northwest

Field trials have begun at Kununurra to see whether sandalwood propagated by tissue culture can be grown commercially in the Ord River region.

The trials are being carried out by Perth forestry consultant Ian Richmond, who has just returned from a three-month Churchill Fellowship to study sandalwood cultivation and collect seed in India.

He said yesterday a survey in 1980 showed WA's known wild sandalwood stocks would run out in about 25 years. The sandalwood industry was one of the State's oldest producers of exports.

It was worth about \$5 million a year and financed much of the early development in the Avon Valley.

Mr Richmond said a method of growing the parasitic sandalwood by tissue culture was

developed by Dr Lakshmi Sita of the Indian Institute of Science. The work was continuing at Murdoch University to find the best hosts and cultivation areas for the North-West.

Mr Richmond said it took a sandalwood tree up to 15 years to produce good quality oil and wood but a well-grown specimen could continue to produce for up to 60 years.

The finest quality oil was used as a perfume base and the wood for joss sticks. The less valuable oil and wood were used for incense and joss sticks.

Most of India's sandalwood was grown commercially in the drier parts of the Deccan Plateau, where conditions were less harsh than on the Ord.

Alex Harris

Letter from Paul Recher

I just read with interest the "Nuts about Chestnuts" article from Jamie Derkenne which was so upbeat about *Castanea* in North Coastal NSW. Our farm is frost free, humid and wet. At Alstonville and Mullumbimby there are some very large, 50 (?) year old plus trees that produce abundant crops of tasty nuts, but it must also be stated that I have already lost 3 of 8 trees from sudden death, and I do mean sudden, almost overnight. Classic root rot syndrome, so I would respectfully submit that all is not as rosy as the article pointed out. Others have experienced this sudden death syndrome as well.

It takes at least ten years assessment of a new tree crop and cultivars before there is a

chance of knowing for sure what cultivars to plant. This goes for all crops. When I read Neville Passmore recommending Shoshoni, Cherokee etc. pecan cultivars, I say, Yes, they should be trialed, but at this time not exclusively. Pecan cultivars are divided into 3 types: Northern type which have a short growing season and can handle the cold areas of the N. USA; Eastern cvs. (incl. Chickasaw, Shoshoni), having as essential selection criteria resistance to the dreaded pecan diseases, eg. scab; Western cvs. which are grown in drier climates without these diseases, which need the humidity of the East.

Most of the recent great work in pecan selection has been done in this Western area. Growers should seriously look at a much wider range of cvs. including the promising "Gra-bols", and for another Eastern type - Kiowa looks good but it is far too early and premature to state the winners.

Castanospermum seed are poisonous unless treated, the method being leaching.

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PISTAG Bulletin

from the Pistachio Action Group of WANATCA

Chairman: Tom Bateman, 4 Lygnern Crescent, Kallaroo 6025. Phone 401 8138

Welcome to the first appearance of the PISTAG Bulletin.

First our special tree offer:

PISTACHIO TREES FROM SYRIA

In 1987 we were fortunate to get seed of some excellent Syrian varieties of Pistacia Vera, supplied by WANATCA member M.T. Mallah of the University of Aleppo. These have been raised by Milan Mirkovic and Alex Sheppard at their Pinjarra nursery, and have shown excellent, vigorous growth. A proportion of the new plants will be made available to members:-

**3 selected Pistacia vera
seedlings for \$15**

These seedlings are being distributed to increase our experience with good ge-

netic stock of pistachios around the State. They are in lots of 3 because a proportion will be male, and everyone should have a chance to get a good-fruited plant as well as a good-pollinating plant. Preference will be given to applicants who already have pistachio trees, and to members, but others should not be put off applying.

Contact Tom Bateman as above. Orders arranged promptly can probably be handed over at the May 16 meeting.

Pistachio Nuts: Nutritional Facts

For every 163 calories in 28 grams of pistachio you get a nutrition bargain (as Percentage of Recommended Daily Intake) of:-

23% Thiamin — an essential component for releasing energy to the body. It is also needed in the functioning of nerve tissue and muscle activity.

17% Phosphorus — works with calcium to provide for growth, strength and maintenance of bones and aids the body's use of nutrients needed for energy production.

13% Magnesium — necessary for nerve impulse transmission. Also needed in the release of energy from carbohydrate and for the building of body proteins.

13% Protein — is a versatile nutrient necessary for building and maintaining

body tissue. It regulates many body processes and can be used as an energy source.

Pistachios also supply smaller amounts of potassium, iron, vitamin E and calcium. They supply 3 grams of dietary fibre for each 28 grams of meat and offer an easy and tasty way to increase fibre intake. The fat in pistachios is primarily mono-unsaturated fatty acids which in recent studies has been shown to lower blood cholesterol.

Pistachios make ideal snacks because the nuts produce little acid which is responsible for dental caries. Not only do they taste terrific, pistachio nuts are good for you too!

Christine Bateman

Reference: Agriculture Handbook #8-12 (U.S. Dept. of Agriculture)

Poor Handling Puts Bruises in Our Bananas

More care needs to be taken by growers, transporters, and retailers if the amount of bruised bananas reaching shopping shelves is to be reduced.

Research conducted by the University of WA has shown that 90 per cent of the blemishes on retail bananas are caused by improper handling.

According to Dr David Turner, Senior Lecturer at the School of Agriculture, ripe fruit is nine times more sensitive to bruising damage than hard green fruit.

Dr Turner said that research conducted by one of his Master of Science students found that hard green bananas suffered similarly to apples when dropped a metre without rebounding.

They absorbed a joule of energy, damaging about 13 ml of pulp which is about two and a half teaspoons. This rose to 120 ml with ripe fruit, and skin bruising increased six-fold once the fruit had changed colour.



David Turner

"Tracing batches of bananas from Carnarvon to the Perth markets, we also found that the sensitivity to bruising was greater immediately after harvest than it was at packing about 12 hours later and arrival in Perth 24 hours after the harvest," Dr Turner said.

"Damage changed as the bananas ripened. When the green fruit was dropped or roughly treated, it tended to crack rather than bruise. After the ripening process began, the damage was felt entirely as bruising of both skin and pulp."

Dr Turner said that fruit damaged at harvest and then stored at low humidity, became dry and unsightly causing it to be downgraded at markets compared with fruit stored at higher humidity levels.

Some experiments done at the Electron Microscopy Centre at the UWA showed that dropping a single fruit from only 20cm could cause bruising damage. The surface of the skin was not broken but the cells beneath the surface had separated and fractured.

"I think that some sort of education programme has to be introduced to counter these problems," he said. "When you compare our fruit to world-wide exporters, such as Central America, you can really see how much better their fruit is.

"In WA there needs to be a lot more care taken and we really must make a bigger effort to produce blemish-free fruit."

James Hamilton

EDITOR'S NOTE

Bananas are being grown in Perth at UWA with great success. A batch of six different banana varieties, planted for a scientific trial, have grown strongly and most have fruited well within 18 months.

The bananas have been heavily fertilized with animal manure and watered twice a day. They are not in a greenhouse, but the

plants are protected by shadecloth wind-breaks around the open planting site.

According to Ian Fox, Glasshouse Manager, the growth of these bananas has been good enough that it would not be unreasonable to consider commercial production of bananas in Perth under protected conditions.

Letter from the Pilbara

The Neem tree seeds you gave me all shot within 5-10 days, I would say almost 100% take. They are now about 6-8 inches tall in pots.

I planted a couple out under trickle soon after germination. They are growing, but very slowly, nothing like the ones in pots in the nursery. I reckon almost anything would grow up here, just requires heaps of water.

Things get a bit tricky from now on for about 3 months with 100 mile an hour easterlies blowing hot off the desert, and of course the cyclone seasons can also throw a spanner in the works.

I'm slowly (trying) to teach the natives something about Tree Crops and in that respect am about to create my masterpiece, cyclones, heat etc. permitting.

I've tracked down some advanced Terminalia catappa, okari, and fernandiana. These will be used as a base (i. e. canopy), shelter will be tagasaste/leucaena and feijoa (Mammoth, Triumph etc).

This will supposedly support bananas, carambola, guava, jackfruit, longan, lychee,

mango, mangosteen, pawpaw, wampi, pistachio, cashew. It sounds all well and good, but it's a start. I guess only one way to find out how things go is by having a go...

I hope to go to Lismore for the conference in August and at the present point in time I'm trying to convince the company I should go on their behalf!

In the new year I'm building a shadehouse at the back of the house so I can have a play-around with all these bits and pieces. Well, keeps me off the street. The eventual goal, as mentioned before — my own piece of dirt.

Ken Herivel,
P.O. Box 270, Wickham 6720 (23.12.1987)

Letter from California

We would like to thank you for the time and information you provided during our February visit to Perth. We were the American couple who came into your Centre asking about avocados in Western Australia.

Every day that I am here, I realize that I am missing the informative talks and seminars that you are providing there. Your enthusiasm is contagious, in other words, I really appreciated what the "men of the trees" are trying to do for your region.

I regret that we did not have more time to get around and see actual tree plantations, but I will be returning to Perth in the near future, and there will certainly be more time for this then. Would you be available as a consultant/guide to help me, along with others, take a tour of tree plantings in the region? I am sure that you must know some of the planters through your organization. Although we would like to meet a few of them, in the interests of covering as much ground as possible, it would not be necessary to talk to them all. Please let me know about the feasibility of such a tour, and what you or an associate would charge to conduct it.

I am sending along a few miscellaneous photos to give you some idea of what the part of California we live in looks like. As you can see, tree farming is the dominant activity among agriculturalists in our area. However, except for backyard trees of all kinds (not tropical), the farmers here have specialized in citrus and avocados. All available level acreage is planted, and thousands of acres of hillsides are being planted with avocados.

There were some chilling temperatures here the last two years, with considerable damage to fruit and trees. I understand that this can be a hazard in WA also. At least you do not have pocket gophers, which destroy the roots of young trees here, but you do have rabbits. Here the coyotes, which look like jackals, keep the rabbits in check, also the squirrels to some extent, but not the burrowing gophers. What about the dingos?

We use legume cover crops to improve soil fertility, and around trees, the main disadvantage of these is that they tend to attract and feed gophers, or so some argue. In terms of fixing nitrogen and adding badly needed humus to poor soil, these are ideal. Some of the varieties, like alfalfa and trefoil, are very deep rooted, penetrating even to subsoil for

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water and minerals. When these are cut or tilled in, the net effect is to bring nutrients to the upper soil levels.

We use Lana vetch for pastures, and it competes very well with other more noxious weeds, since it climbs all over them and smothers them out. Vetch here is like a soft blanket with pretty purple flowers that produce little pea-like pods. Best of all, it reseeds itself year after year, and even tends to spread its range. Probably because it can fix its own nitrogen, vetch can grow in soil so infertile that other grasses and weeds cannot grow. I have seen it growing here in white, shaley soil . . . and it pretty much had the area all to itself, without competition from other species.

Are seeds for vetch, trefoil, clovers, lupens, etc. available over there? Do you have and use other, comparable legumes to improve soil? If seeds are not readily available there, perhaps it would be worthwhile to run some through quarantine, because they are here. As you might gather, I greatly favour vetch, and have introduced it in a variety of situations here, including hillside orchards. Besides the advantages already mentioned, a really important characteristic this legume has is the ability to grow in the cool part of the year, which is the rainy

season for both W.A. and California. Same with the clovers and trefoil, but not with alfalfa.

I very much enjoyed reading the issue of Quandong (Feb) that we picked up there. I am enclosing US\$20.00 in hopes of receiving a few more issues by mail. If this is too much trouble, not to worry . . . put it on my account. Nut crops require considerably more processing, as you know, than fruits, but in California anyway, they are more mechanized. You certainly have the market for nuts there.

On the non-edible side, we have done plantings of jojoba here, and we can report that they are definitely one of the most drought resistant crop plants around. We irrigated plantings by drip emitters for only two years, and then removed the system. From that point on they grew, flowered, and fruited in even the driest years on natural rainfall. A cost effective harvesting method appears to be to place or spread some kind of sheeting under the nut-laden bushes, and then hit the nuts off with a bat or stick. Nuts can be vacuumed, swept or otherwise gathered from the surface. Movable pieces of corrugated sheet metal worked fine, since the nuts tended to gather in the grooves. Jojoba oil is really a marvellous conditioner

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for skin and hair, but again, processing equipment, in this case, an oil press, is required to render the crop marketable.

Keep up your good work in the Tree Crops Centre. I will save the remainder of my questions and comments for when I next come to Perth, which I hope will be

REPLY from David Noel

I was very pleased to get your letter and to learn that you enjoyed your visit to W.A. When you return to Perth, I will certainly do my best to help you and your associates see whatever interests you here.

I should caution you that W.A. is generally well behind the development stage reached in horticulture in California. Our tree crop industries are small and not tightly organized; we have no massive research programmes backed by Government (or anyone else). On the other hand, I believe that our development *potential* is huge, and in fact we have the potential to become the world leaders in horticulture. I base this belief on the fact that horticultural conditions here have been judged markedly superior to those in California, both by an early W.A. Government comparison and in the opinion of a Californian orchardist currently resident here and closely familiar with both localities. Our land is cheap by world standards, water supplies are adequate – we lack only the necessary capital and organization!

Another real plus for Australia is that it is the only Western-style nation with extensive tropical areas. In W.A. alone, the size of twelve average U.S. states, we have a complete range of climates, to go with latitudes comparable to those of Oregon down to Venezuela.

soon. If you know of any needs in W.A. in the way of rootstock, seed stock, etc. that might need to come from California, please let me know. I am not aware of all the current quarantine procedures, but I do have some 5-year-old procedures from Canberra (1983).
**Hugh Carroll, 3021 Grand Ave,
Fillmore, Calif. 93015, USA**

Please give me more details on the timing of your expected next visit, the number of people who might be coming, and, most important, their purpose, ie what they expect to gain from the visit. If your group expects only to see W.A. practices, to compare with what they are already doing in California, we have only a limited amount to show. On the other hand, if some of the group are considering either moving part or all of their operations to W.A., or investing in new horticultural industries here, we have an excellent range of contacts to facilitate this. We would also need to know the areas of interest – whether restricted to our temperate and sub-tropical zones or anywhere in the State, whether conventional fruits only or a wider range, etc.

Citrus have been grown here commercially for many years, but the industry currently is in rather a tired state. Avocados have become important, with quite a number of new plantings going in and good prices still being obtained for fruits (A\$1-2 each), but to put it into perspective, total State plantings probably amount only to 200-300 acres.

In W.A. we do not seem liable to the 'killer freezes' which have been such a problem in California or Florida on occasional years. I have wondered why this is so. I suspect that these 'killer freezes' are not locally generated, but are transferred as large blobs of

freezing air from adjacent naturally-cold regions. Such freezes have occurred in the Murray River area of eastern Australia (they may have come from the Snowy Mountains), and about 2 years ago they actually had snow on the Atherton Tableland area of North Queensland (on my theory, this was transferred from the highlands of Papua New Guinea). However, here in W.A. we have no adjacent high, cold regions.

On pests, as you say, we have no gophers, nor squirrels. Rabbits are not really a problem with tree crops. Kangaroos will eat foliage in bush areas, but are not as much a problem as escaped cows are. I have never seen a dingo here outside a zoo. The biggest tree crop pests here are birds, especially members of the parrot family, some of which have very powerful jaws. There are a range of non-destructive control methods available, often not especially effective. Generally the only effective approach is selective shooting. These parrots are intelligent, adaptive creatures and if they calculate the odds are bad on your patch, they will shift to another!

Legumes have been widely developed here, but mostly for pasture and grazing, together

with seed production. Western Australia was the centre of development of sweet lupins for food purposes, giving high-protein foodstuff similar to soybean. Subterranean clover and medic are used for soil improvement. On vetches, Namoi woolly pod vetch and Popany purple vetch are used for seed production in W.A., according to information I obtained (this is rather out of my area). The Lana vetch you mentioned is believed to be available from Queensland.

Thank you for your offer to try and supply needed propagation stock. Many tree crop seeds can be imported, by arrangement, subject only to inspection and fumigation, but growing plant material such as budwood is much more strictly quarantined (except for tissue-culture material). I am sure there are many things we need, though, and will revert to you on this after asking around.

Finally, do let me know particular species which those among your group may be interested in. I believe that macadamias will do particularly well here as an industry in the future, and your group may already have some involvement with these. Cherimoyas are another fruit which you may be familiar with, I expect them to do well here too. Do you know about ollalie(?) berries?

BOOK REVIEWS

The Food Potential of Seeds from Australian Native Plants. Proceedings of a Colloquium held at Deakin University on 7 March 1984. Edited by Gwyn P. Jones. Deakin University Press, 1985. 212p. Paperback. Available from Granny Smith's Bookshop at \$19.95.

How did I miss this one for so long? It contains some invaluable material, a real eye-opener to our underexploited plants, most of which are trees.

There are 14 information-packed articles. Much of what they said was new to me. Opening with a review of 'The unexplored potential of indigenous plants as

food', other articles deal with use of seeds by Aborigines, nutrients in seeds, and Australian seeds in food products.

Two articles of special interest to me were on 'Kernels of Santalum species as human food' and 'Commercial prospects for edible nuts of Athertonia diversifolia and Elaeocarpus bancroftii'. The Santalum genus includes the quandongs and the sandalwoods, which are noted for the high oil content of their kernels, up to 68%. These species are currently attracting considerable attention for development, but this is the first article I have seen which has a lot of hard data on their properties.

Athertonia is a relative of the macada-

mia from the Atherton Tablelands of Queensland. Its nuts have been said to be superior to those of the macadamia. It may have a great future. The Elaeocarpus species is commonly called the Kuranda Nut or Johnstone River Almond. While locally appreciated, it is hardly known outside north Queensland. The nuts are excellent.

Other articles deal with Acacia seeds, Hovea seeds, and our native coral tree, Erythrina vespertilio. To conclude there is an excellent article on 'Domestication of food trees in Australia', by WANATCA members E.J. & I.M. Laszlo, and a discussion on indigenous Australian plants as serious potential food crops. Recommended.

Alley Cropping: A stable alternative to shifting cultivation. B.T. Kang et al. International Institute of Tropical Agriculture, Oyo Road, PMB 5320, Ibadan, Nigeria. 1984. 23p. Paper.

A fascinating little booklet on a newly developed alternative to the slash-and-burn technique widely used in the wet tropics, or the swidden method used in temperate countries. Instead of clearing whole fields from the forest, planting these with field crops for 2 or 3 years until the fertility is gone, and abandoning, a permanently fertile method is used.

This method depends on growing fast-growing nitrogen fixing trees (e.g. leucaena) in rows, 2-4 m apart, and planting field crops (e.g. maize) between the rows of trees. Once or twice a year the trees are

slashed off a few feet from the ground; their foliage decays and provides the nutrient for the next planting of the field crop. The process can be continued virtually permanently.

This is a method highly suitable for developing countries where the cost of artificial fertilizers is prohibitive. Yields of the field crop are maintained or even improved, in spite of the apparently 'competing' trees, and useful by-products such as poles and firewood are obtained also. I cannot see why the same technique should not be adapted to cooler climates also, with say tagasaste

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grown among pome fruits and slashed in autumn to let in winter light and feed the next fruit crop.

Not available commercially, but a copy exists in the University of WA Library, or try writing direct to the publishers.

Brief Notes

Proceedings of the First National Low-Chill Stonefruit Conference. Edited by Ian Skinner. Exotic Fruit Growers Association, PO Box 80, Lismore Heights, NSW 2480. 181p. Paperback. \$20.00 postpaid (\$24.00 overseas) from above address in NSW.

A total of 28 papers covering all aspects of stonefruit production in warmer cli-

mates.

Jan Bilton's Tamarillo Cook Book. Irvine Holt, New Zealand, 1986. 64p. Paperback. \$8.95.

Growing Tamarillos. New Zealand Government Printer, 1984. \$4.95.

Between them these two booklets represent most of what has been published in book form on tamarillos or tree tomatoes. Both available from Granny Smith.

The Nut Lovers' Cookbook. Shirli Carder. Celestial Arts, California, 1984. 165p. Paperback. \$11.95 from Granny Smith.

Around 300 recipes using 18 different nuts. Interesting and recommended.

David Noel

ALF ORTON

The last issue of Quandong sent to Alf Orton was returned marked 'deceased'.

And so passes one of our oldest members, member no. 14 and a Founder Member of WANATCA (or WANS, West Australian Nutgrowing Society, as it was then).

Alf had reached an advanced age. He was a real character. When I first met him he was living in a 6 x 10 foot tin garden shed on his property at Baldivis. He grew many tree crops with enormous enthusiasm, and some unusual things, like multi-coloured silver beet, as well. He handed his produce out freely.

He built his house himself, higher up on the property, a strange construction behind a massive earth wall (for protection from the strong winds there). The facilities there were also a little strange, and Alf was usually at war with the local council authorities.

Occasionally he would visit me in Shenton Park, always bringing a present of produce. On the last occasion, he noticed my neighbour, and remarked that he looked like a German. As my neighbour came in to speak to me, Alf whipped out a mouth-organ and started playing 'Deutschland über Alles'.

David Noel

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Nut growers aim at local market

People treat Amos Machlin with caution when he says he spends time on the "nut-farm" in Gingin.

But growing nut trees has allowed Amos to return to the land, relax in his retirement and crack a massive and mostly untapped local market.

The former engineer for the Perth City Council has entered his third season as a nut farmer (principally pecan), the fruits of an ambitious plan that began 10 years before his retirement.

Amos wanted to return to the land after retirement and had his sights on a crop that was not labour intensive and required little attention to operate efficiently.

He and his wife, Jeannette, came up with the idea of producing nuts when they discovered that nut kernels consumed in WA were largely imported from the United States, and to a lesser extent from the Eastern States.

Last year's figures showed that Australia imported nine million kilos of nuts: 7.6 million kilos of walnut, brazil, pistachio, cashew, hazel, walnut, almond and pecan kernels worth \$47 million, and 1.45 million kilos of the same nuts in shell, worth \$4 m.

Mr. Machlin believes that the local market for pecans will soar when consumers realise their quality is better than the imported nuts. Imported nuts were often up to 12 months old when they reached the WA market. "Many people say they don't like pecan nuts, but you haven't tasted one until you've eaten it fresh."

Mr Machlin's own research into the industry, which started 10 years before his retirement, revealed reasons for disparity in quality of locally-produced and imported pecan. First, and probably foremost, was the fact that little was known locally about pecan production. The search for detailed information took the Machlins on several trips to America.

They sifted through mounds of information to choose the most appropriate type of pecan from about 50 varieties, proper management techniques, and harvesting and

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processing techniques.

However, to get the enterprise off the ground two essential ingredients were needed — money and time, said Amos.

Their 20 hectare property, nestled into the side of Lennards Brook, has been well capitalised for a project that was originally planned as a hobby.

The machinery for shelling the pecans was imported from the United States and is believed to be one of only two such units in Australia. It is the only one in W.A.

Amos agrees the machinery has made his property over-capitalised, but only until his farm system achieves a targeted potential of 25 tonnes of pecan.

The machinery — which cracks, shakes and cleans the nuts — is also essential in getting the shelled kernels on to the market. Last year the couple produced two tonnes of pecan nuts and the machinery was made available to other growers on a contract basis.

A chill room has also proved valuable. Unshelled nuts, which keep better than kernels, are kept chilled until ordered by health food shops and other food stores. The chill room also allows produce to be sold for premium prices during the off-season.

Return per kilo ranges from \$2.50 to \$4



Amos Machlin

in shell depending on seasonal demand, while kernel halves could fetch more than twice that price.

Any nut tree takes about ten years to reach maturity and this is another reason why nut growing has not been popular in WA. However the pint-sized industry could represent formidable competition for suppliers outside WA if more farmers were prepared to accept a long-term commitment, said Mr Machlin.

The local and South-East Asian markets were ready for the taking if enough people decided to grow nuts. Recognition of differences in quality between imported and locally-grown produce could open massive possibilities for domestically-grown nuts.

Tim Trevenen

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SELECTION FOR A BETTER QUANDONG

Part 2 (Continued from Feb 1988)

The Quorn trees are irrigated with highly saline water, reported to have a conductivity (E.C.) of 4776 micro-siemens/cm at 25° and containing 1264 mg per litre of chloride, which undoubtedly affects their growth and yield.

Fruit colour varies from bright yellow, through pinks, light reds to dark reds. Fruit shape varies from a flattened sphere to a quite long-necked pear shape. The fruit may have a smooth surface or quite distinct vertical ridging. There is distinct variation in leaf shape, colour and size.

At all three sites some of the trees have still not produced any fruit at all. The best tree at Quorn produced about 1600 fruit in its tenth year. At Paringa the best tree produced over 4000 fruits in its eighth year and at Koorlong, in its fourth year, the best tree produced over 2000 fruits.

The ratio of flesh to stone is likely to be important to consumers. Among all the trees so far fruiting in the three collections, the percentage of flesh ranges from about 42 to 70 percent. Actual fruit size ranges from a tree average as low as 2 gm to an average of 17 gm.

The earliest trees begin to mature fruit in late July or early August and some trees are still maturing fruit into December. Some trees mature all their fruit over a period of about one month, while others take up to three months to mature their crop.

With some selections, the skin of the fruit is seriously damaged by even light rain, once the fruit is mature. Other selections appear to tolerate rain without any damage at all.

Quandong as Food

The flesh of the quandong can be eaten fresh, but in this form it lacks widespread appeal. It is high in vitamin C and the kernel is also well endowed with both oil and protein. The fruit is usually quite acidic. When cooked for use in pies, sugar is usually added to taste. It can also be served as stewed fruit. It is often made into jams and jellies. It can be minced up and dried into kamaradin, or fruit leather, either on its own or blended with other fruits such as sultanas, dates or apples. When candied, the fruit is quite attractive in both appearance and taste.

The kernel can be eaten raw or it can be lightly roasted. In some selections people find a methyl benzoate after-taste quite objectionable. This is less noticeable in other selections.

Germination and Propagation

Previous work on germination and propagation has been reported. The quandong seed is very susceptible to fungal infection. The current suggestion is that the seed should be carefully sterilised in 7 percent sodium hypochlorite for about thirty minutes, without removing the shell, then dusted with a suitable fungicide. The seed can then be placed directly into pots or plant bags of about two litres capacity, about 2 cm below the surface in a free draining, sterilised potting mixture. The pots should be kept moist but not waterlogged.

To be continued

West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

EXECUTIVE COMMITTEE 1988

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ACTION GROUPS

PISTACHIO: Contact Tom Bateman, 401 8138

CALENDAR OF FORTHCOMING EVENTS

1988

May 18	Wed	*General Meeting (Gilbey: Weed Control in Orchards; Passmore: Fruits of Thailand)
May 22	Sun	Field Trip: Machlin Orchard, Gingin
Jul 19	Tue	Executive Committee Meeting
Jul 22-24		'S'Nut Growing in Australia' Conference, Albury, New South Wales
Aug 15-19		§ACOTANC-4 Conference, Lismore, NSW (4th Australasian Conference on Tree & Nut Crops)
Aug 17	Wed	*General Meeting (? Growing macadamias in W.A.)
Sep ??	Sun	Field Trip: Greening Australia Hamel Nursery, Warona
Oct 18	Tue	Executive Committee Meeting
Nov 16	Wed	*Annual General Meeting

*General Meetings are held at the Naturalists Hall, 63 Meriwa Street, Nedlands, starting at 7.30 pm. These meetings usually include a plant auction and current magazine display.

§ For contact details refer to the Tree Crops Centre

Members wishing any matter to be considered at an Executive Committee meeting should contact the Secretary by 2 days before the meeting.

Current Subscription Rate: \$30.00 per year
(includes all publications for the year). Student Rate: \$15.00

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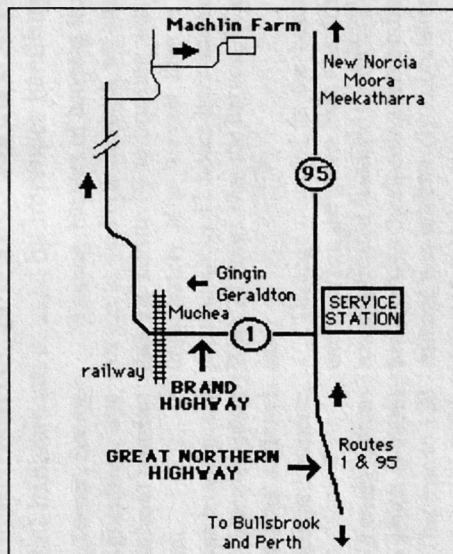
FIELD DAY THE MACHLIN ORCHARD AT GINGIN Sunday May 22 (Meet at Orchard at 12 noon)

Don't miss our next Field Day at the Machlin Pecan/ Macadamia/ Pistachio Orchard at Gingin. This orchard is now producing several tonnes of nuts a year and uses advanced harvesting and cracking equipment.

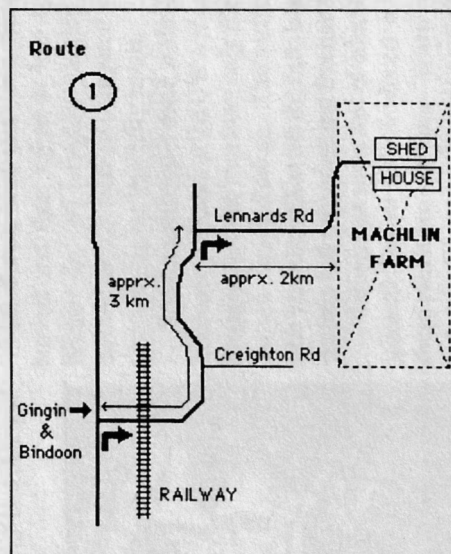
Meet at the Farm at 12 noon. and bring your lunch with you. Barbecues, hot and cold water, and toilets

are available. We expect to move off on the farm tour around 1.15, and expect to finish about 4 pm.

Please keep children under control and respect Amos Machlin's generosity in opening the property for inspection by not interfering with anything unless permission has been given.



Mud Map 1



Mud Map 2

*** ALL WELCOME TO ATTEND ***