

Quandong

magazine of the

West Australian Nut & Tree Crop Association (Inc)

Second Quarter 1992

Vol 18 No 2 • ISSN 0312-8989 • \$2.50

Registered by Australia Post : Publication WBH0868



The PILI (*Canarium ovatum*) (See: About the Cover, p.2)

Next Meeting:

For WANATCA's next General Meeting, our speaker will be Hans Schoof. Hans' subject will be:

Soil Fertility and Tree Crops: Organics/ Synthetics

Hans Schoof is a local consultant on Soil Fertility and Productivity. He was born and brought up in Germany, where he was educated and obtained a degree in Agronomy as an Agricultural Engineer.

He came to Australia in 1968. Before going into practice as a private consultant in 1987, Hans worked with various Australian agricultural service companies and also ran a number of overseas projects, including ones for FAO in the Gambia and for the German development organization GTZ in Sri Lanka.

For the past 5 years he has been advising farmers and orchardists on aspects relating to soil improvement practices. He deals with all aspects of crop

production, using soil/tissue analysis, fertilizer and soil conservation programs, regular crop inspections, and post-harvest assessment of crop yields, quality, and storage life. He has developed a unique computer program for soil and leaf analysis. Hans has written and published two well-regarded books on Plant Nutrition and Soil Fertility. He conducts around 50 seminars or workshops each year for farmer and grower groups and assists with training sessions.

His general objective is to improve the productivity and quality of agricultural produce and ensure that viable, sustainable growing practices are established.

(Hans may be contacted on 09-388 2094)

Time: Wednesday May 20, 7:30 pm

Place: Naturalists Hall, 63 Meriwa Street, Nedlands

WANATCA Field Day — Sunday May 31, 1992

Our next Field Day, at Miami south of Mandurah, is an opportunity for readers based in the Southwest to see an innovative property.

Assemble 11.00 am at the Bernie Langridge property, 18 Pleasant Grove Circle, Miami.

Bernie has developed a very innovative mini-orchard property, mostly using organic methods. Emphasis will be on the new methods used.

Also, Bernie's son Lex, former President of National Association for Sustainable Agriculture, will present a talk Factors in Organic Orcharding.

Current subscribers should receive a detailed leaflet with this issue of Quandong. For late details, contact David Noel on 385 3400 or Neville Shorter on 450 5606. Non-members are welcome to attend this Field Day.

About the Cover . . .

Our cover picture shows *Canarium ovatum*, the Pili Nut of the Philippines.

The illustration is from *Promising Fruits of the Philippines*, by Roberto Coronel. Details of this book will be found in the Book Review section of

this issue of *Quandong*.

The Pili produces an excellent nut, and the surrounding fruit is also edible. The nut is semi-commercial in the Philippines, where Pili icecream and candied pili nuts can be bought.

The 1992 issue of the *WANATCA Yearbook* will have a full article on the *Canarium* family.

The \$10,000 Lychee Tree

Lychee trees are not especially easy to grow and fruit in Perth. Although actually a sub-tropical species, rather than being truly tropical, lychees (botanically *Litchi chinensis*) much prefer a more humid climate and lower temperature extremes than typically occur here.

So I was very impressed last January when Dr Sujit Dey showed me the lychee tree on his Woodlands property which was loaded with ripe fruit.

installed an automatic watering system. He has used cow manure as a mulch, but cautions that it must be kept away from the actual trunk of the tree.

The tree, about 5 years old, is only about

Also growing in the same garden were



Dr Sujit Dey and the lychee tree in Perth

2 metres high. It is not extensively protected, but does have a shade cloth cover over the top.

The lychee is of the variety 'Brewster'. The literature notes that this variety actually needs appreciable chilling in the winter for good bud growth in the following Spring.

Dr Dey has paid detailed attention to the lychee's irrigation and fertilization, and

several mango trees, all bearing fruit, and pineapple plants growing in quite dense shade. The pineapples were of a small, very sweet Hawaiian variety.

Since establishing and raising his lychee tree, Dr Dey has moved to a new property in Nedlands.

Unable to bear the thought of a new owner

ripping out the tree, he has foregone sale or rental of the property for almost a year — he reckons the tree has cost him \$10,000 in lost



A bunch of the ripe lychee fruits

rental!

Early in May, when the weather had cooled down, arrangements were made for the ArborCentre to move the lychee and some of the mangos to his new house. Unfortunately, in spite of precautions, much of the root systems of the trees was lost.

One week after transplanting, all the lychee leaves have turned brown, and everyone is waiting with bated breath to see whether the tree shoots again. More later . . .

— *David Noël*

Farewell Alex Sas

Alex Sas, WANATCA Life Member and a former Vice-President of the Association, died on April 2 after a long period of ill-health.

One of the early members and continuing stalwarts of the Association, back to the period when it was called the West Australian Nutgrowing Society, Alex's special genius was in propagation.

His small nursery in Roleystone was the source for a surprisingly big number of common and uncommon nut and fruit trees. Accurate and painstaking in his work, Alex was able to succeed with difficult species where others failed.

In his native Czechoslovakia, Alex trained as an agricultural scientist, but when he and his family came to Australia in the 1950's he turned more to food health matters. For many years until his retirement, he was Chief Dietician in the Royal Perth Hospital. He knew all about the health value of nuts and fruits, so it was natural that he should turn his love of plants towards helping the development of tree crops in his adopted country.

Always a gentle, helpful, and informed person, Alex will be sorely missed in the Association. Our profound sympathies go to his wife Maria and his children, including Alex Junior, currently working on grape research at Middle Swan.

— *David Noël*

[West Australian/ September 27, 1986]

Grumichama: A sweetie from Brazil

The Grumichama is another member of the myrtle family from South America that includes the pitanga, jaboticaba and feijoa. Other members of this adaptable family closer to home include the eucalyptus and the lilly pillly.

Botanically known as *Eugenia dombeyi*, the grumichama is a highly ornamental small tree with a delicious purple-black fruit.

It is widely recommended for many subtropical areas because it is easy to grow and produces abundant quantities of good eating fruit.

Crimson to purple-black fruits appear four weeks after the pretty white flowers. About the diameter of a dollar coin, the fruits have a thin skin and white melting flesh.

The pleasant flavour makes grumichama worth eating fresh off the tree. It also can be stewed and used for jam, jelly and in fruit cakes.

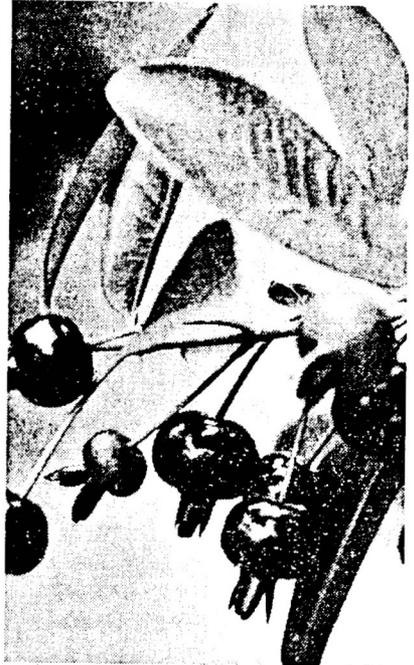
Like the jaboticaba (tree grape), grumichama is a slow-growing compact small tree. A mature height of four to five metres can be expected. It makes an excellent hedge plant and is worth considering for tub planting.

Its big, handsome leathery leaves are dark glossy-green. New foliage has a purple-red colour which adds an attractive highlight in the early summer months.

Most Eugenias are fairly cold hardy. When the grumichama is mature it can withstand temperatures down to minus 2°C. I have seen young plants in pots breeze through a cold winter under shade cloth with no apparent distress.

This robustness in the face of our most severe winters gives me confidence that grumichama will prove to be a very successful introduction to Perth gardens.

While our sandy soils are very free



The dark purple-black grumichama fruit is thin-skinned with soft melting flesh and a pleasing sweet flavour

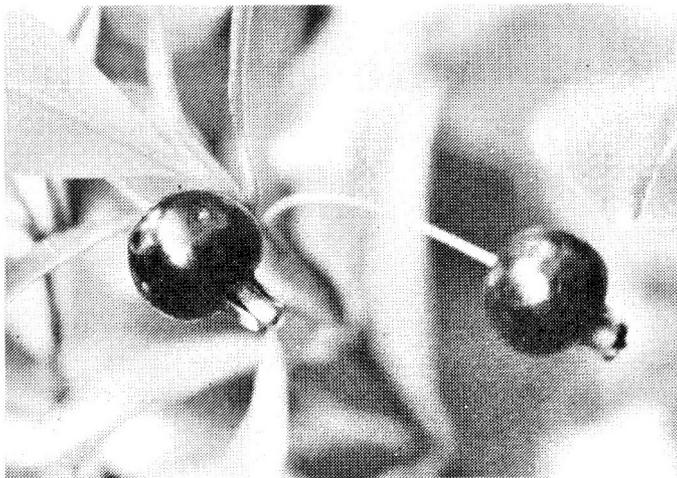
draining, they need substantial bolstering with organic materials to provide a successful springboard for growth. I recommend two parts organic material such as Compeat, Groganic, or mature cow or chicken manure to one part original soil.

During summer, grumichama appreciates ample watering and a humid atmosphere. Increased humidity can be achieved by heavy mulching and by positioning sprinklers either in the canopy of foliage or above the tree.

This sort of extra care may sound a “bit much”, but I would recommend no less for a lemon tree in order to achieve good results. Like a lemon, your grumichama will perform under a lesser regime, but will fall short of achieving its potential.

Under favourable conditions you can look forward to enjoying grumichama coffee cake or grumichama liqueur in about three years from planting.

Long before you enjoy the fruit, however, you are sure to appreciate the good looks of



Grumichamas grown in Shenton Park, Perth
[Photo: David Noël]

this charmer from Brazil.

— *Neville Passmore*

Enquiries active — *What's the future for horticulture?*

Two Australian-Government sponsored enquiries into the future of horticultural industries here are in train at the moment. The first is a project run by the Government's Horticultural Policy Council, who are gathering submissions and views for a document to be titled *Future Directions for Australian Horticulture*.

This new HPC document, when released, is expected to set the structure for future horticultural developments in Australia for many years to come. I made a submission to the HPC on behalf of the Tree Crops Centre (there was not time to prepare an official WANATCA document), and sent a copy, at his request, to Rex Bean of Victoria, current

President of the Australian Nut Industry Council.

Rex thought there was enough interest in this submission to reprint the basis of it in *Australian Nutgrower* (Autumn 1992 issue). Because of this, it seemed that readers of *Quandong* might also be interested, and the text is reproduced below.

Meanwhile, the Federal Government's Industry Commission has also been set to make an enquiry into the Horticulture Industry, and has been receiving written and personal submissions around the country. The IC sat in Perth on April 7, and I gave them a submission made up of the HPC one below plus a further document on the costs and

difficulties encountered by those importing useful tree crop species for background research.

— David Noël

'Future Directions for Australian Horticulture' Project

Herewith my somewhat maverick contribution to your debate. It is maverick not for the sake of being different, but solely to provide some counterbalance to the 'rational', 'sensible', and 'commercially realistic' contributions which will no doubt form the vast bulk of what you receive.

I should note that this is a personal contribution from my position as Director of the Tree Crops Centre, rather than any official submission from the West Australian Nut & Tree Crops Association Inc, of which I am currently President.

What I will be trying to get over to you here is a more longer-term and global approach than what you will receive from the 'rationalists'. There is a basic defect to the rationalist approach. Anyone, inside Australia or elsewhere, can apply a rational approach, and almost any rational thing which might be done by a horticultural enterprise in Australia can equally well be done by another rational horticultural enterprise elsewhere.

Of course all these enterprises are ultimately in competition. When an overseas enterprise has far superior capital backing, as many of them do, it is inevitably the party with the most capital backing which ends up on top. We have seen this, for example, with the wheat market. Australian wheat farmers may be the most efficient and rational in the world, but they will still lose out. They must. The scales are weighted against them too heavily at the moment.

And it is not just a question of money capital. Far more important, in the long run, is what might be called information capital. An example:—

Over the first four decades of the present century, the United States Bureau of Plant Introductions carried out a deliberate and sustained

project to introduce as many possibly useful plant species and varieties as it could into the USA. This was done as the main activity of a significant federal government department, set up solely for the purpose.

The numbers of plants involved were not small. Sometimes a species was introduced and re-introduced over the years, sourcing material from many countries and seed provenances. Introductions were not just trialled in one place, such as the nearest quarantine station, but were spread around a range of potential growing sites.

These introductions were not numbered in the hundreds, or even thousands. More than 140,000 introductions were made. Systematic records were kept, and as a result the USA ended up with an information capital asset unmatched anywhere else in the world. Not only did it possess a huge bank of living plant material, available for later exploitation if needed, it also gained a wealth of practical information on why and where particular species succeeded or failed in introduction.

Now to look closer home. Australia does not have the resources to match the US effort, which is a pity, since Australia has extensive tropical areas which could be the home to horticultural industries

GRAFTED FRUIT & NUT TREES

SHAHTOOT King White Mulberry
MANGO

MACADAMIA

KIWI FRUIT (Male & Female)

PEACH, NECTARINE (Low Chill)

CUSTARD APPLE

CARAMBOLA

PERSIMMON

NASHI, AVOCADO, CASIMIROA

Also seedling Papaya (Taiwan hybrid),

Tamarillo, Guava, Carob, . . .

Gilbert's Wholesale Nursery

Pacific Hwy, Moorland NSW 2443

Phone (065) 56 3148

climatically unsuited to the USA or anywhere else in the developed world. Australia is, in fact, the only developed country in the world with extensive tropical areas. What it needs to succeed in horticulture, in my view, is an approach to research and development — that is, to building up information capital — which is slanted quite differently to elsewhere.

“To succeed with your product, first identify your markets”. That is the cry of the rationalist, in horticulture as in other fields. I suggest that this is a formula for followers, not leaders; for those trying to take over an existing market, not innovators creating new ones. It is a formula for being second-best.

The valuable kiwifruit market, now a significant part of New Zealand's export income, was not created through rational government-directed research. It came about through the side interest of a few nurserymen, idly trying out a handful of seed someone had brought back from China.

Only when some enthusiasts had shown the way, and demonstrated that good fruit could be grown and sold for a profit, and in fact an industry had already begun, was there any help from Government.

In Australia, the present government emphasis on horticultural research and development is to identify a particular industry, and encourage them to cooperate and put funds into industry R & D with some government support. The macadamia industry is a good example.

Fair enough. But the point is that such an approach only helps an existing industry, it does nothing for potential new industries. In actual fact the macadamia industry was not created in Australia, but in the USA. And what R & D is done, is very rational and cost-justified, offering perceivable and reasonably immediate commercial returns. It has to be — the macadamia industry does not see itself as a public benefactor, trying out a range of interesting new nuts for the hell of it. Like any industry, it is in competition, on a world stage, with little financial scope or incentive for improving the world at large.

It so happens that in South America there exists a wealth of species of oil-producing palms, quite different to commercial oil palms. Some of these South American trees produce excellent edible oils, judged superior to olive oil. They could very conceivably form the basis for a new and exciting tropical oil-producing industry for Australia.

But first, a few rational figures. Time to get seed located, imported, and germinated, 5 years. Establishing suitable growing conditions, add another 10 years. Selecting varieties and testing fruits, another 10. Large-scale planting to get commercial yields, another 20 years. Establish and debug a processing mill, another 10. Develop and exploit the market, another 20. Probability of a successful result, after 75 years, well under 1 in 20, perhaps under 1 in 100.

Not the sort of picture to attract commercial investors or ‘justify the expenditure of public funds’! And yet the rational outcome of this situation is that no-one attempts any such project. In the few areas where governments still actually support research, such as in universities and, decreasingly, in Departments of Agriculture, only clearly cost-justified projects where the outcome can be foreseen, such as a treatment for a particular fruit disease, have any chance of getting the go-ahead.

The paradox is that if the outcome can be foreseen, the research is not worth doing, from the information capital point of view. The chances of anything major of longer-term benefit coming out of it are negligible.

SEEDS

Fruits, Nuts, & lots more

100's of species

Personal collection in season

for list, send SSAE to

**FRUIT SPIRIT
BOTANICAL GARDEN**

Dorroughby NSW 2480

Phone (066) 89 5192

There is an answer. That answer is to encourage and assist the enthusiasts, those who try things out just for the hell of it. The backyarders and amateurs, looked down upon by the professional researcher, will put their own time and money into this research, given the least encouragement. Hundreds will labour, at a fraction of the cost of a few professional, inevitably constrained, investigators.

In the WA Nut & Tree Crop Association we have set up the beginnings of a R & D Partnership scheme on this basis. The Association provides only a tiny amount of 'seed money', perhaps \$100, for information location and seed or materials procurement. The researchers get whatever financial benefit they can from selling the new plant they have introduced or the new technique they have developed. The Association gets back information on how the project went.

The Association has tried to get outside funding for this and other R & D initiatives, but without success — the system is stacked against it. Only safe, boring, and relatively useless projects, submitted to the appropriate committee in excruciating detail by establishment-approved workers, get any help. Money for producing censuses of farmer attitudes to salinity, OK. Money for enthusiasts to try out exotic pistachio species for saltland reclamation — forget it.

It all comes down to a question of gambling, of probability. Governments could easily put quite small amounts of money into importing a wide variety of propagation material of useful plants and offering them around, they would find no shortage of people willing to try them out at their own expense. Or they could block-fund an organization like ours to do this for them. Perhaps, ultimately, only one in a hundred, or one in a thousand of the new plants would 'come to anything' — but it is just these 'lucky ones' which would make it all worthwhile.

The United States Government 'gambled' their money, at very long odds, starting over 90 years ago. The information capital they built up with that gamble paid dividends. Almost a century later, their capital is still growing, rather than deflating. And still the dividends come. ///

[Citrus Industry (South Africa), May 1991]

Applications of Remote Sensing in Agriculture

Although remote sensing, an offshoot of the American space program and military and security missions, is not a new technology, agricultural applications thereof have come about relatively recently.

Remote sensing can:

- show temperatures of trees and allow growers to find areas needing more irrigation;
- differentiate between areas of high and low vigour;
- show frost damage.

Many a farm has orchards where patchy areas of high or low yields occur. Some trees have smaller diameter trunks and fewer and smaller fruit than neighbouring trees, but it is often impossible to determine whether there is any pattern at all to the varied growth within an orchard.

\$300

Get your property assessed for

NUTS & TREE CROPS

(including tree forage, windbreaks etc)

- Examination of property
- Discussion of development aims
- Written report, recommendations
- We go anywhere

To: Nut & Tree Crop Consultants
 PO Box 27 Subiaco 6008 • Ph. 09-385 3400
 Please send details:

Name.....

Address.....

In a case like this, remote sensing could pinpoint some salient features of the particular orchard.

Thermal Measuring

One classic example is that the trees might not be irrigated properly, and are thus not yielding to their full potential. This could be due to the initial preparation of the orchard. Often land is levelled by moving top soil from the higher areas to the lower areas, giving lower areas a richer layer of top soil, while exposing the higher areas. Infrared surveying, which detects heat, will show that the lower areas absorb more water and thus have healthier trees.

During a remote sensing operation, an aircraft equipped with special sensors in the visible, near infrared, and/or thermal spectral bands flies over the orchard. The sensors measure light wavelengths (which may vary according to temperature) emitted from the trees and soil. A computer reads the digitally-recorded wavelengths and translates them into colour dots, with each colour representing a temperature spectrum.

If a tree is not receiving enough water, its ability to cool through transpiration will be affected, so the temperature of the tree will rise. Remote sensing is able to detect the higher heat of the tree and that will show up on the computer printout. Trees on high ground with less topsoil show up as having a higher temperature than well-watered trees on the low ground. The sensor is, however, not only limited to detecting heat from the trees; it also records ground temperature.

Tree Health And Size

Other bands on the sensor can provide indications of tree health and size, which may ultimately provide information about the size of the harvest or allow assessment of cold damage. The remote sensing technology used

in agriculture is an offshoot of NASA Landsat imagery. It monitors the same spectral bands as the satellites, but instead of being in orbit, the remote sensing equipment is flown within 2 km of the ground. This reduces the pixel size (minimum recording area) of the image down to less than 1 square metre, which is detailed enough to characterize every single tree located on thousands of acres.

Canal Leak Monitoring

Remote sensing can show a grower if there are leaks in an irrigation canal.

Soil Survey

Variations in soil due to changes in organic matter, texture as well as physical and chemical composition, can be determined. This is very useful in areas that have widely varying soil types. The soil may run from a light soil to a heavy clay within the same irrigation unit. With a remote sensing survey, it will be possible to adapt the irrigation schedule to remedy problems.

Frost Damage

It is also possible to obtain a map of freeze patterns, and graphic documentation of the extent and severity of damage. This aspect allows a quick and accurate ground verification of damaged fruit and an evaluation of effectiveness and placement of frost protection equipment.

Fertiliser Application

Imaging may also be used as a management tool for the effective application of fertiliser. Orchard surveys will enable the farmer to identify and fix problems that will save him money on fertiliser. Not only is fertiliser getting more expensive, but there are also a number of environmental concerns being raised about the runoff and its effect on the environment. Technology can thus be used to maximise fertilisation efforts.

Remote sensing is thus a tool of the future

and can be used in agriculture to detect problems long before they become apparent to the human eye.

— **M. Purnell**, Citrus & Subtropical Fruit Research Institute, Private Bag X11208, Nelspruit 1200, South Africa

Editor's Note: Remote sensing and tree crops was the subject of the interesting talk which Baard Maehle gave to the WANATCA meeting on February 19. All the above applications are available from Baard's company, ImageCraft (see advert this issue). In addition, Baard can map for soil salinity, a vital factor in planning drainage and irrigation facilities.

The Fruit Tree Doctor

For help with your tree health and pest or disease problems, phone:

Neville Shorter

Horticultural Consultant

Telephone 450 5606

(best time 5.30-7.00pm).

Advice also given on:

- tree types
- varieties
- site selection
- windbreaks
- nutrition
- tree establishment

REMOTE SENSING SERVICES FOR HORTICULTURE

Complete properties mapped from
\$600

Complete range of overfly mapping facilities:

- Water Mapping (shows all water on property to depth of 6+ metres)
- Tree Health Monitoring (water stress, insect and disease attack on individual trees)
- Soil Mapping (accurate mapping of changes in soil types, textures, organic content)
- Salinity Patterns (variation and movement of salinity)
- Irrigation Monitoring (effectiveness for individual trees)
- Earthwork Planning (location of dams, drains etc)
- Tree Planting Data (locate plantings effectively)

Contact Baard Maehle at

ImageCraft

28 Mt Henry Road, Como, WA 6152

Phone 09-313 1924

COURSES

from Australian Horticultural Correspondence School

Both Hobby and Career Courses

- | | |
|---|--|
| <input type="checkbox"/> Photography | <input type="checkbox"/> Herbs |
| <input type="checkbox"/> Business Studies | <input type="checkbox"/> Plant Propagation |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Turf |
| <input type="checkbox"/> Landscaping | <input type="checkbox"/> Cut Flowers |
| <input type="checkbox"/> Fitness | <input type="checkbox"/> Hydroponics |

Over 130 different courses including Certificate & Diploma

Australian Horticultural Correspondence School



Australian Horticultural Correspondence School

35 Dutton Way, Singleton WA 6211

Phone A. Lewis (09) 537 1360

Principal: J. Mason Dip. Hort. Sc. Supn Cert.

Tick Courses of interest

Name.....

Address.....

New nut harvester a first for WA

Now on its way over to the rich macadamia orchards of northern NSW is a WA-built nut harvester which could be the start of a new export industry.



David Noël (left) and Alex Sheppard check out the new harvester

The harvester, built in the Welshpool factory of John Deere, is an advanced production prototype built to the patented designs of Bill Convine of Dunoon.

Mr Convine started designing and building macadamia harvesters four years ago, in 1988, to meet the requirements of the growing local macadamia industry. The new Convine Harvester is the third model in the development process, and the first intended for routine production trials.

Mr Convine, who calls his machine "The Happy Reaper", says he chose John Deere to make the machine because of their engineering expertise and their ability to produce a machine of international standard.

Rod Tunnercliffe, Sales Manager of John Deere's Engineering Contracts division, says that although the Convine Harvester has been built under a contract with Mr Convine, John Deere will be involved in the promotion and sale of the new machine.

He points out that John Deere are well positioned to sell such a machine on the world market, in view of their established status as an international agricultural machinery supplier.

The production prototype, although not large by broad-acre farming standards, is quite big for an orchard machine, and suited to large commercial macadamia producers. The machine is designed for coupling to the right of a medium (50 hp) tractor with power

take-off and hydraulics.

Because the macadamia tree evolved in the sub-tropical rainforests of NSW and Queensland, it has different growing requirements to traditional temperate nuts like walnuts and almonds.

One of these requirements is the presence of a good mulch of leaf matter under the trees, providing a cool moist environment for the shallow roots.

Good mulching practice can lead to a dramatic improvement in macadamia yields, so it is vital for an efficient harvester to preserve the mulch in operation.

The Convine Harvester achieves this by sweeping up the both the mulch and the nuts together with a carefully-positioned brush unit, which then passes the mixture over a stainless steel grid. Most of the mulch and plant debris falls through the grid and back under the trees.

The new machine has a bank of 9 brush units. All these feed at their rear into a steel auger system over another stainless steel grid. The auger pushes the hard round macadamia nuts along to the left-hand side of the machine, where a pto-powered fan blows off any large light leaves which have not fallen through the auger grid, and passes the nuts up a pipe for delivery into a trailer unit.

Each brush unit can be micro-positioned through a pair of wheels to the exact height above the ground where it will brush up all nuts and mulch, but not score the surface of the ground. Having a series of individual units means the harvester will accommodate to small depressions and rises under the trees.

The harvester, about 2 metres wide in

the 9-brush configuration, has four rubber-tired wheels and is purposely built fairly low (about 50 cm high) to travel under the macadamia canopies, while the propelling tractor rides between the tree rows.

Each of the rubber tyres, and all the brush-positioning wheels, have blowers and/or auxiliary brushes to move nuts and mulch away from in front of them so they will be picked up by the adjacent brushes. The brushes and auger are driven from the tractor's hydraulic system.

Currently available nut harvesting equipment is almost all imported from the United States, and is relatively expensive. It also lacks the ability to replace mulch during harvesting, being designed mostly for almonds, walnuts, and pecans.

The new machine look to be both cheaper and better than the imported equipment. Alex Sheppard of the WA Nut & Tree Crop Association believes that although this machine was designed for macadamias, it should also be suitable for other nuts such as chestnuts, pecans, almonds, walnuts, and pistachios, and even for some fruits such as oil olives, by slotting in appropriate units.

The variations needed for particular crops might be differing grid sizes to suit larger or smaller nuts, differing brush fibres and textures, and switching the steel auger for a nylon or brush auger, for softer nuts and fruits.

One alternative unit is already available. This is a mulching unit, where the brush units are replaced by ones with knives which draw in and chop up mulchable material under the trees. These units would be used outside the harvesting season to achieve a



View showing attachment to tractor

better mulch cover.

The new machine represents an Australian innovation with a potential world market. It also represents a most desirable trend in the approach to exporting — exporting know-how and expertise rather than material products.

A tonne of macadamia nuts can be sold overseas only once, but a single expertise package can be sold time and time again, and generate its own follow-up demand.

It is expected that after final proving in the coming autumn macadamia harvesting season, orders will be taken for standard production models for the 1993 harvest.

Mr Tunnercliffe believes that the new harvester units will fetch around \$30-40,000 each. A package comprising harvester, tractor, and trailer may be available for around \$70,000.

If the demand is there, smaller and cheaper units on the same principle, but with fewer brush units, could be built for smaller

nut orchards. Such units could be self-propelled, and even electrically driven.

Rod Tunnercliffe can be contacted at John Deere on 09-362 0399.

— *David Noël*

First Time Offered in Australia **TOCTE TREES**

(*Juglans neotropica* —
the Evergreen Black Walnut)

\$15 each; reduction for quantity (20+)

From WA-produced seed! Healthy well-grown trees in plastic bags, up to 1 metre tall.

These fast-growing, almost evergreen true walnuts produce excellent timber, good edible nuts, and may also be used as rootstock for other walnut species.

Contact Nola Washer at

Avowest Nursery, Carabooda

Phone: 09-407 5100 • Fax: 407 5070

The Neem Revolution

Over the years, I have come across a number of 'miracle' plants which were supposed to change the course of human history, and when, about eight or nine years I came across the first references to the use of Neem, I maintained the usual healthy scepticism.

Now I can say it — this one is It! The accumulated evidence and reports do truly support the claims which have been made about the Neem Tree and its big range of products and abilities.

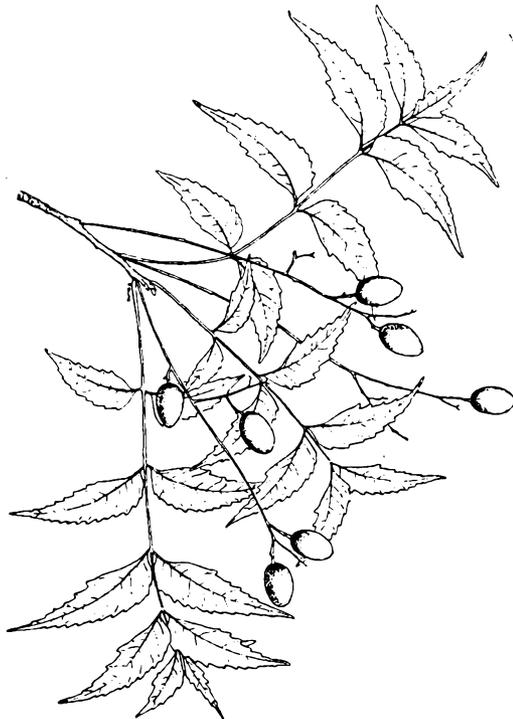
Of all these properties, perhaps the most important of all is the ability of neem extracts to act as a safe, natural insecticide. With this ability alone, the Neem could justify its title of a 'miracle plant'.

But the neem has many more invaluable characteristics — uses in medicine, a source of industrial products, and as a fungicide and viricide. And it is not a temperamental plant to raise, but instead is a tough, heat-resistant and drought-resistant tree which has already proved its worth in reforestation, erosion control, and fuelwood production in such 'difficult' areas as the Sahel region of sub-Saharan Africa.

Now two books have become available which open up the World of Neem for general use. Easily the most important of these is *Neem, a Tree For Solving Global Problems*, just published by National Academy Press for BOSTID, the Board on Science and Technology for International Development of the US National Research Council.

Readers who are already familiar with earlier BOSTID books will know of their fine reputation as well-written, carefully-crafted books which aim to open up areas of possibly fundamental future importance in improving the world we live in, especially those parts of the Third World and elsewhere which have suffered from pervading disadvantages in the past.

In the so-called 'Green Revolution', new high-yielding strains of various food crops such as rice were introduced to the Third World to relieve food shortages and improve economies. These efforts have been relatively successful, but the success came



at a price.

When actually applied, the big drawback to the Green Revolution crops was found to be that they required significant applications of synthetic fertilizers and pesticides for good yields. The cost of these was great enough to cut out most of the economic gains from the higher yields, and their ecological effects could be very serious. As an example, traditional Bali rice-growing used an integrated system, in which fish played an important control role in the rice-paddies, and were a useful source of protein food. All that went by the board with the new, chemical, monocultural approach of the Green Revolution.

Now we have a chance for a new approach, the Neem Revolution, which will tackle the problems of food shortages in developing countries in a new, sympathetic, and locally-based way. The crux of the approach is the realization that major proportions of food crops, in developing countries and elsewhere, are lost to pests. Thirty percent is a routine figure, and much higher losses can occur, as when the locust clouds descend.

The Neem Tree, *Azadirachta indica*, is a member of the mahogany family Meliaceae, native to India and Burma. It is a close relative of *Melia azedarach*, usually called Cape Lilac in WA, White Cedar elsewhere. The latter is native to SE Asia and Australia, where it is found wild in northern WA, Northern Territory, Queensland, and New South Wales, and is naturalized in South Australia.

Because of its potential as an insecticide, quite a lot of work has been done on Neem in Australia. Plantations have been established in warmer areas, and neem products may well be a commercial crop of the future for Australia.

However, trials to date have suggested that existing neem samples do not do well in areas with cooler winters, such as Perth. The neem has grown brilliantly in the Pilbara region of WA (on the tropic of Capricorn), and appears possibly commercial down to Geraldton, 500 km further south. Below there, we might need to look for more cold-tolerant seed sources (Neem is grown right up to the Himalayan foothills), or focus on varieties of Cape Lilac (certainly cold-tolerant, and believed to have similar insecticidal properties).

The BOSTID book looks at Neem from a global viewpoint. It contains 10 chapters and 5 appendixes. The first two chapters, 'The Vision' and 'The Reality', contain an excellent review of what neem is all about, what has been claimed and proved for its products, and where its economic potential lies. Chapters 3 and 4, 'The Tree' and 'What's in a Neem' look at the tree's origin, growth, culture, and chemical nature of its constituents.

It might be thought that if Neem contains some 'magic chemical', this could be synthesized industrially and thus destroy the market for the natural product. In fact, Neem is shown to contain a complex mix of more than 20 different compounds, which somehow work together to produce the startling results obtained — as always, diversity is best.

Chapters 5 to 7, 'Effects on Insects', 'Effects on Other Organisms', and 'Medicinals', look at all the insect pests which can be controlled by Neem (a table lists 45, including fruit flies, cockroaches, locusts, aphids, mosquitos, thrips, caterpillars, weevils . . .), and explains their mode of action, whereby useful insects (bees, ladybirds, mantis) are unharmed but destructive pests are stopped. The big range of human ailments which can be treated with Neem are considered.

Chapter 8 deals with Industrial Products (oil for soap, cosmetics, and lubricants, fertilizer, timber, fuel), and Chapter 9 deals with Reforestation, with a good survey of actual use of Neem for this purpose in 15 countries of Africa, Asia, and the Americas. Chapter 10, 'Next Steps', looks at what is needed to turn the promise of Neem into reality.

The various Appendixes deal with Safety Tests, demonstrating the harmlessness of Neem towards mammals, birds, and fish, with Population Control (use as a contraceptive), and the usual invaluable and comprehensive BOSTID lists of literature references (7 pages) and Research Contacts (10 pages).

This book is a complete kit to finding out about Neem and helping to play a part in its development to improve the world in a rational, ecologically-sensitive way. It is both a publishing landmark for a particularly valuable tree species, and perhaps a watershed in the development of full-spectrum, macro-permacultural approaches to crop raising. I would recommend it very highly.

NEEM, A Tree For Solving Global Problems.
BOSTID, Washington, 1992. 141 pages,
Paperback.

Available at A\$25.35 plus \$2.50 post from



As a test of neem's ability to repel insects, entomologist Thyril Ladd dipped a glass rod into dilute neem extract and wrote the letters "N" and "M" on a soybean leaf. He then exposed the leaf to the Japanese beetle, a pest renowned for a voracious appetite for soybean leaves. As can be seen, the bulk of the leaf was stripped to its woody veins, but the insects succumbed to starvation rather than nibble on the "N" or "M." (T. Ladd)

Granny Smith's Bookshop, PO Box 27, Subiaco, WA 6008 — Phone 09-385 3400. Readers ordering through bookshops should ask them to contact the Tree Crops Centre (the Australasian distributors) at the same address.

Another book about Neem just recently available in Australia is *Miracles of Neem Tree*, by G.S. Verma. This little book, produced in India, is in its fifth reprint (1988). It is a fascinating practical compendium on the use of neem products to treat a huge range of human ailments.

After a short introduction on the extraction of neem products for medicinal use, from neem leaves, fruits, bark, resin, and roots, the main bulk of the book (14 chapters) deals with diseases of specific parts of the body (head, eye, ear, teeth, nose, throat & lungs, spleen, rectum, skin), types of disease (leprosy, fevers), or human groups (men, women, children).

The range of ailments for which neem treatment is suggested in this book is truly amazing. If it was not that many of the claims are also substantiated in the BOSTID book (*Neem: A Tree For Solving Global Problems*), it would be

understandable if these claims were dismissed as fanciful. Everything from serious diseases like Malaria, through non-fatal problems like Piles, on to minor problems like Sweating Feet, all have suggested cures. There is gruesome description of treatment for "brain worms, a generally fatal disease which very rarely spares its prey. Manifestations of the disease are lowered tone of speech and subsiding of the bridge of the nose".

The author, who died in 1983 at the age of 79, was a follower of the Ayurveda system of medicine. Here in the 'West', there is a new willingness to look at some of the traditional medicinal practices of the 'East', with the aim of adapting those parts which can be shown to be useful under 'modern' conditions. Readers interested in such aims will find this book a mine of information for consideration.

Miracles of Neem Tree. By Pranacharya, Kvj. G.S. Verma. Rasayan Pharmacy, New Delhi, 1988. 72 pages. Paperback.

Available at A\$9.95 plus \$2.50 postage from Granny Smith's Bookshop.

— David Noël

Compulsory Macadamia levy imposed

The Australian Government has brought in a statutory levy on macadamia nuts as from April 1 this year.

The levy replaces a voluntary one set up by the Australian Macadamia Society Ltd on production by its members, and has been introduced at the request of the AMS. Proceeds of the levy will pass through the Australian Horticultural Corporation and the Horticultural Research & Development Corporation (both Federal Government bodies), and are intended to be used for the 'purposes of promotion, marketing, and research and development of macadamia nuts'.

Under current arrangements, a horticultural industry which raises funds for such purposes from voluntary or compulsory levies, or other sources, can get matching funds from the Australian Government if these funds are channelled through the AHC and HRDC. However, the industry pays the administration costs of the scheme.

The new levy applies to both locally-sold and exported nuts, and will normally be collected by the processor rather than from the grower. Growers who produce less than 1.5 tonnes will be exempt from the levy, and there will be a maximum levy to be paid by any one grower, equal to the charge for 670 tonnes (\$20,100 maximum).

The levy rate set is 3 cents per kilogram of consigned mass (ie nut in shell at 10% moisture content), of which 2 cents will go to the AHC and 1 cent to the HRDC.

The AMS have used the AHC/HRDC arrangement in the past to good effect, and are the first major nut-producing industry to pursue a statutory levy (there is also a chestnut levy, but the chestnut industry is currently quite small here). My only concern is the lack

of available research money for prospective tree crop industries which are not already established.

According to the last AMS annual report, the bulk of their revenue, almost \$200,000, came from levy and associated income, subscriptions being the next biggest item at around \$30,000.

These are huge sums compared to the WANATCA budget of around \$10,000, which needs to cover services for a huge range of crops, not just one. Prospects are gloomy for the smaller 'sunrise' horticultural industries being able to pull themselves up by their own bootstraps, without any effective government support.

— *David Noë*

New Hamel Nursery Catalogue Available

Greening Australia's Hamel Nursery have released their new tree catalogue, featuring an extended range of species.

Most trees are sold in trays of 30-60 jiffy pots, at around 50c/tree. Pots with individual trees mostly cost \$1.00-1.50.

This year Hamel are offering a new service, for raising unusual plants not on their list to meet a customer's request. There is a cut-off date each year for this service, in 1991 it was December 20.

Manager Alan Lewis can be contacted at PO Box 147, Waroona 6215, phone 097-331 241.

[Horticultural Research & Development Corporation: Annual Report/ 1990-91]

Australian research on macadamias: a summary

Six regional varietal trials in Queensland and New South Wales are comparing 23 Hawaiian selections, new to the Australian industry, 12 Australian selections, and 5 varieties widely planted in Australia.

The trials were planted in 1984 and 1985, and all produced commercial crops in 1990. Breeding and selection of high yielding cultivars adapted to Australian environments is the major objective of the project.

Various selections have performed well in the early stages of the regional trials. Of the new Hawaiian selections, 772, 814, 791, 842 and 849 are the most promising at this stage. Of the Australian selections, NG 18, HV A5, HV A16, Own Venture and Daddow are performing well.

A CSIRO study is also directed to the development of high yielding varieties which can improve the industry's viability. For example, the A2 selection of Henry Bell shows a 15% improvement of kernel recovery over standard varieties.

This project has succeeded in developing techniques for the extraction and separation of macadamia isozymes. Leaves have proved

to be the best source for separating and localising macadamia isozymes, and 75 different varieties have now been analysed for their isozyme configurations. By relating isozyme configurations to varietal performance, it is hoped to identify the varietal combinations that will improve productivity by increasing yields as well as by increasing kernel recovery rates.

Intensive water relation studies at Alstonville, NSW, have shown that macadamias are very efficient at extracting water from the soil and conducting it through plant tissues. It is estimated that macadamias have a water-conducting system which is 2.5 times better than citrus, and they show considerably more drought tolerance than was previously thought.

Investigation at Maroochy Horticultural Research Station, in Queensland, has concentrated on examining macadamia

Do YOU Need:

- *Irrigation ?*
- *Fertilizer Equipment ?*
- *Pump/filter Equipment ?*
- *Propagation Equipment ?*

....then call



Watering Concepts

(09) 277 8055

(8 Camden Street, Belmont 6104)

HELPING YOU GROW !



seedling growth in acidic soils limed to various pH values.

Macadamia seedlings can grow satisfactorily at low pH values (as low as pH 4 in some soils), but growth was reduced when the soils were limed to pH values greater than 6. The results suggest it would be better to keep the pH of potting mixes/soils around pH 5 to 5.5 for optimum growth of macadamia seedlings.

A Queensland Department of Primary Industries project is examining the effect of roasting method on macadamia nut quality, comparing the effects of oil roasting and dry roasting on the storage stability of nut

kernels. Taste testing showed that oil roasted samples had a better colour and appearance than dry roasted nuts.

A challenging study has been undertaken in Queensland, by staff of the Department of Primary Industries Food Research Laboratory, and medical staff from Wesley Hospital. The aim is to determine if a diet which incorporates a significant amount of macadamia nuts or oil will favourably affect blood fats.

Similar research with avocados produced positive results and, if the same can be shown for macadamias, it would represent a major marketing advantage, given the increasing public interest in dietary cholesterol.

ASIMINA SEED OFFER

The Tree Crops Centre has obtained a supply of selected Asimina seed from the F.W. Schumacher Co. in America for a seed distribution.

The Asimina (botanically *Asimina triloba*) is native to the United States, where it is usually called Pawpaw. However, the plant is totally unrelated to the plant called Pawpaw in Australia, this *Carica papaya*, best called the Papaya.

Instead, Asimina is a relative of the custard apples. It produces long, often yellow fruits, somewhat resembling bananas, and some varieties have an excellent flavour. There are many enthusiasts for its development in the US, but so far no-one has got it to the commercial stage. Time to get our own back for the macadamia?

Unlike the Papaya and most of the custard apples, the Asimina is definitely a cold-climate plant. It is deciduous, and has no problem with months of snow cover, so

probably should not be attempted anywhere where it is too warm for apple production.

According to literature sources, the Asimina likes shade when young and does best in loose, friable soils. The best source on this fruit is the R*O*D reprint *The Asimimal American Pawpaw Collection*, available from Granny Smith's Bookshop.

Regarding germination, the suppliers say "the seed should be soaked in water 48 hours (change after 24 hours) at room temperature prior to placing in cold stratification [this usually means leaving in the fridge, not freezer, in a sealed plastic bag with a little peat moss or paper towel]. Stratify for 90-120 days prior to Spring sowing. We avoid over-drying Asimina seed as this will kill it."

The seeds resemble custard apple seeds, but are huge, many as big as kidney beans. To obtain a packet of 10 seeds, send \$5 to the Tree Crops Centre at PO Box 27, Subiaco WA 6008. This cost includes postage. Seeds will also be available at the May WANATCA meeting.

Red Scale — An Early WA Biological Approach

The following interesting account of a biological approach to combatting Red Scale has been found by David Brown. It is from: *The Handbook of Horticulture and Viticulture of Western Australia* (3rd Ed., Govt. Printer, Perth, 1921, pp. 616 - 617)

Red Scale (Aspidiotus aurantii, Mask)

This was, until some years ago, the most serious scale insect which the citrus fruitgrowers of this State had to contend against. It has a very wide range of food plants, and attacks all varieties of citrus fruits, and is often noticed attacking the quince, guava, pear, fig, loquat, mulberry, castor bean and rose as well as many other garden plants and shrubs. Leaves, fruits, and branches are attacked.

California made a long and continuous search for the parasite of this scale, but it was not discovered until 1900, when it was found in China by Mr. Geo. Compère, and from there sent to California, where they were liberated in an orange grove well infested with red scale, and, notwithstanding that the owner of the grove promised the officers of the State Board of Horticulture that he would not spray or fumigate the trees in order to give

the little parasite a chance to become established, this promise, says Mr. Compère, the owner kept, so far as the spraying or fumigation, but turned to and cut out the trees and burned them, with no explanation to offer for his action, only that he had not promised not to burn the trees.

During a subsequent visit of our entomologist to China in 1905, only a few scattered specimens of the red scale were to be found; these were sent to this State and from them a few specimens of the parasite were bred and liberated.

A parasite of the red scale (*Aphelinus fucipennis*) — a tiny chalcid wasp — has now established itself strongly in California, and also in this Western Australia, where it was concurrently introduced from the same source. In February and March, 1906, swarms were found in scale infested gardens in West Perth, and also at Kalamunda at Mr. Parmenteer's orchard, where a few specimens of the helpful parasite had been liberated.

Orange and lemon trees which some 10 to 15 years ago were fumigated every two or three years are now left severely alone, and are all the cleaner for not being interfered with, as it was found that fumigation was fairly efficacious but, when strong enough, destroyed the young bud-carrying shoots, thereby throwing the trees back one season and causing the loss of one year's crop.

COME TO THE HOME OF FRUIT



- For • Professional Advice • Free Information Leaflets
 - Competitively Priced Hi-Tech Fruit Trees
 - We've Got The Lot
 - Exotics • Nuts • Stonefruits • Pomefruits
- (From *Acerola* to *Ziziphus*)

Blossoms Garden Centre

2311 Albany Highway, Gosnells 398 1315 • 398 2425

BOOK REVIEWS

by David Noël

Over the last six months or so, an exceptionally rich array of books valuable to tree croppers has come to hand. Because of this, the reviews which follow are somewhat briefer than would normally be the case, and some items which would merit review have had to be omitted. Two books on Neem are dealt with elsewhere in this issue of *Quandong*.

CORNUCOPIA: A Source Book of Edible Plants. By *Stephen Facciola*. Kampong Publications, Vista, California, 1990. 678p. Paperback. \$55.95*.

"In your hands is one of the most remarkable efforts to come out of the struggle to preserve the genetic diversity of our planet". Thus begins Noel Vietmeyer's preface to Steve Facciola's stupendous and unique compendium of plant sources. It is a truly awesome work.

No doubt in 10 years' time, people will wonder however growers of edible plants managed before *Cornucopia* was available. Anybody coming across this book for the first time would guess that it was the product of a large team of workers, labouring on for some years. The thought that it could be produced by one man is quite hard to accept. I know now why Facciola, a former WANATCA member, dropped out of sight some years back — he must have given almost everything else up besides the compilation of this book.

Resembling a hefty telephone directory in size, *Cornucopia* is divided into three main sections. The first is an alphabetical listing of less well-known edible plants, under family. For each species named, a short description of the species, its characteristics, and uses is given, together with references to further information and, most valuable of all, suggested sources of supply. With species which have named varieties, each of these is described, again with suggested sources of supply.

Taking as an example the Capulin Cherry, *Prunus salicifolia*, Facciola notes in 7 lines the characteristics of the fruit, its uses, such as for filling special tamales in Mexico, its low chilling requirement, adapted to warm-winter areas where true cherries are unable to produce, and its natural range, from Mexico to Peru. Four literature references are given, plus, in coded form, 5 suppliers of plants or seeds. The general entry is followed by descriptions of 6 cultivars, each given around 5 lines, again with supplier codes.

This first part contains descriptions and sources for around 3000 species. This number is to be compared with the 150 or so species actually grown commercially around the world, and the 20 or so species which provide the vast bulk of humanity's food supply. Hence the comment about the need to preserve biodiversity — most of what we eat comes from a tiny 1% of the range.

The second part of the book is a detailed cultivar listing for more than 110 of the major crops. For example, characteristics of around 400 varieties of apple (with references and sources) are given, though Facciola notes that some 8000 apple varieties have been described.

These two sections take around 500 pages of the book. The last 140 pages are devoted to source lists, indexes, and appendixes of every sort — for example, keys to 60 different usage types (barks, gums, piths, tea substitutes ...). Everything is

USEFUL TREE SEEDS FROM CHILE

Good range of seeds of fruits, nuts,
and other useful trees from Chile.
Many should be suited to Australia.
Contact Jan Correa for list at:

Gondwana Seeds

Casilla 53027, Correo Central,
Santiago 1, Chile

accurately cross-referenced, carefully keyed to provide utility with the minimum of space needed.

Addresses and phone numbers of around 1350 source organizations are given, including 150 commercial sources outside North America and 150 non-commercial organizations which can be approached for rarer seeds or plants.

For anyone involved with growing food plants outside the tight commercial range, this book is an absolute must.

Tropical Planting and Gardening. Sixth Edition. By H.F. Macmillan, revised by H.S. Barlow, I. Enoch and R.A. Russell. Malayan Nature Society, Kuala Lumpur, 1991. 767 pages, Hardback. \$69.95*.

Macmillan's *Tropical Planting and Gardening* has a long history, stretching back to the first edition, published in Ceylon in 1910. The book soon established itself as the first reference source for everyone interested in warm-climate plants (subtropicals, such as pistachio nut, are also covered).

However, the last edition was published almost 50 years ago, in 1943. Because of its great utility, second-hand copies of this edition were keenly sought, as hard as hen's teeth to find. With great commendability, in 1983 the Malayan Nature Society began to look at the possibility of reprinting the fifth edition to serve a public need.

It soon became apparent that with the long lapse in time, a total revision of the book was called for. By lucky chance, when Macmillan died in 1948, his widow arranged for Kew Gardens in London to store his photographic collection, comprising crates of heavy glass plates. These plates, which fortunately had not deteriorated with time, were made available by Kew for the new edition, and were supplemented by many new photographs from around the world.

The revision team (which included Rob Russell of Queensland) are to be congratulated on the thorough and extensive revision — a comparison with the previous edition shows it to be closer to a rewriting. Considerable new information has been added, such as on tissue culture propagation — not in general use in Macmillan's lifetime. The

revisers make it plain that with the wealth of species covered, more detailed information on many is inevitably omitted, but reference is made to the modern sources of such information.

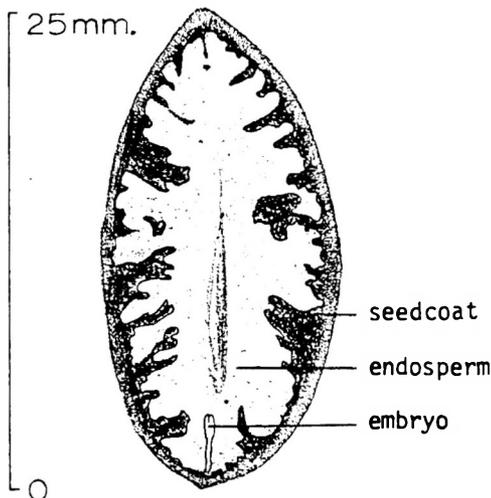


FIGURE 3.—*Torreyya californica*, California torreyya: longitudinal section through a seed showing the folds of the inner seedcoat extending into the endosperm, 3 ×.

California Torreyya Nut, from Seeds of Woody Plants

Book buyers are fortunate that the (non-commercial) publishers made every effort to keep the cost of this massive book as low as possible, in order to reach the large audience it deserves. This book is very highly recommended.

Trees and Shrubs of the Sahel: their characteristics and uses. Hans-Jürgen von Maydell. Verlag Josef Margraf, Germany, 1990. 525p. Pb. \$83.45.

For Sale Pecan Seedlings

Well grown in tall bags

\$4-5 each

Contact:

Alex Hart on 09-490 1324

71 Terence Street Gosnells 6110

This valuable book on the useful woody plants of the Sahel, the semi-arid lands bordering the southern edge of the Sahara Desert, was a product of the German Government-supported international aid and development agency, GTZ. It was originally written in French (the working language of many of the Sahel countries), but recognition of its usefulness has prompted GTZ to produce this version in English.

This is above all a practical book to encourage wider use of these arid-zone species, rather than a botanical treatise. All the major tree species are dealt with in great detail, using excellent colour photos. For example, the entry on *Acacia senegal* (locally called Verek), the source of the universally used Gum Arabic, has 6 photos of the tree and its parts, showing tapping of the gum.

For each species, details are given of botany and growth habit, distribution, site requirements, propagation and management, uses, and references. The uses section may be extensive, and include commercial information — for example, gum arabic is the highest quality natural gum available, exports run at around 60,000 tonnes per year, mostly from Sudan.

Considerable attention is given to soil stabilization and ecological improvement with these species. Most are native, though some widely naturalized species such as Neem are included.

This book is a treasure-house for anyone interested in the establishment of useful tree species in more arid areas of Australia. Although the price is fairly high, the information contained within the book will more than repay the cost.

Seeds of Woody Plants in The United States. Prepared by the Forest Service, C.S. Schopmeyer, Technical Coordinator. US Department of Agriculture, Washington, 1974 (reprinted 1989). 883 pages, Hardback. \$89.95*.

This massive US Government publication notes that it is written "for everyone who works with seeds of trees and shrubs. Part 1 includes chapters on the principles and general methods of

producing and handling seeds. Part 2 is a compilation of seed data on 188 genera of woody plants including conditions, seed yields and weights, methods of breaking seed dormancy, germination tests, and a large collection of fruit and seed photographs."

The book is not restricted to native US species, but includes many introductions (eg Paulownia) and non-American relatives of local species.

This very thorough and comprehensive sourcebook will be most valuable for those concerned with raising trees from seed or with handling or storing seeds.

Promising Fruits of the Philippines. Roberto E. Coronel. University of the Philippines at Los Baños, 1990. 521 pages, Paperback. \$84.95*.

This book is a uniquely useful source on the lesser-known fruits and nuts grown in the Philippines, whether of local origin or introduced. No space is used for the more common commercial fruits of which the Philippines is a major producer, such as coconut, mango, and banana. Instead the emphasis is on second- and third-rank fruits, not of the highest present commercial importance but nonetheless with great scope for future development.

The bulk of the book covers 24 tree crop species of intermediate importance in the country. These include good coverages of fruits grown elsewhere in the tropics (sugarsop, cashew,

Wanted
Frugivory Research
Partner/ Longterm
Helpmate

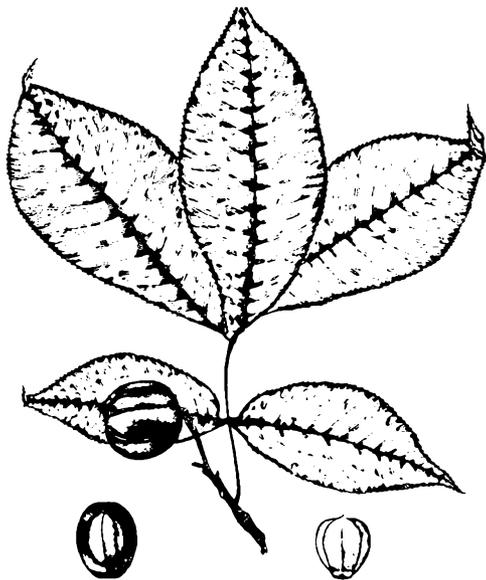
To assist in analysis of Ecosystems, Food Webs, and Frugivore types. Investigate: Nurse trees/ Keystone mutuals/ fauna specialised to displace the habitat of vermin/ Agroforestry potentials.

Please write if interests totally match:

Mark Ashton, 'Symbiotic Agroforestry',
PO Box 86, Dunedoo, NSW 2844.

sapodilla, guava, langsung, mangosteen, rambutan) and tropical production of some normally temperate crops (grape, strawberry). Particularly valuable sections are those on local-origin fruits (pili nut, santol) or ones not widely grown elsewhere (canistel).

The last 25 pages of the book cover 16 minor



SHAGBARK HICKORY
Carya ovata (Mill.) K. Koch

From: Trees, Shrubs, and Woody Vines

fruits, many being of local origin (bignay, kalumpit, mabolo, marang), and thus this section contains much information available nowhere else. The whole book is well provided with excellent line drawings and extensive references are supplied.

Drawbacks of the book include the fact that only local names are quoted for the species (eg Atis for the sugarsop or sugar apple), and that an index is lacking. This is the third printing of a work originally published in 1983, and not commonly available.

Trees, Shrubs, and Woody Vines of the Southwest. Robert A. Vines. University of Texas Press, Austin, 1990. 1104 pages,

Hardback. \$99.95*.

The cover of this book has the subtitle "A guide for the states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas". In a review mostly devoted to massive books, this is the ultimate, a monumental work resulting from over 25 years of work, 400,000 km of travel, and weighing around 3 kilograms!

Every woody plant species in the five southwest U.S. states is covered, including many cacti. The emphasis is on plant botany and ecology, although notes are given on ones which are edible or otherwise useful. More than 1200 species of native and naturalized species are described, with a similar number of superb line drawings.

For Australians, the biggest attraction of this book is as a sourcebook for species likely to be of value for introduction to areas climatically similar to those covered in the USA.

*Prices quoted for books are those currently applying to sales from Granny Smith's Bookshop (see advert, page 27).

[Growing Today/ September 1991]

Asimina in New Zealand

With reference to the question whether the deciduous custard apple relative *Asimina triloba* will fruit from seedlings, the answer is a definite yes!

I have a number of trees grown from seed which produced fruit at five years of age.

The tree does not exuberantly put on growth and must be persevered with, but the fruit is worthwhile.

For best results sow only seed of the yellow-fleshed variety.

— Brett Burney, Hamilton, NZ

New nut processing plant set up at Collie

WANATCA member Bernie Rogers has recently set up a new pecan nut processing plant at Collie, and is actively looking for nuts to process.

Bernie himself has a pecan orchard of around 1000 trees at Collie, in our Southwest. These include 17 varieties, although the main ones are Western Schley and Wichita. Bernie expects a production from his own trees of around 4 tonnes.

However, he believes he has an assured outlet for at least 60 tonnes of nuts a year, in the form of kernels. He is actively seeking offers of further nuts for this market.

Bernie is also willing to arrange cracking and processing of growers' nuts on a per-kilo

charge basis. If the supply is there, he will also attempt to provide cracking facilities for other nuts, such as macadamias and almonds.

This is the second major nut cracking plant set up in WA. The first was that of WANATCA Executive member Amos Machlin at Gingin, north of Perth. This was described in the last issue of *Quandong*.

Bernie Rogers can be contacted at 90 Buckland Street, Collie, WA 6225 — Phone 097-341309.

— *David Noei*

Letter from Julie Firth

(to David Noel)

Thanks for the copy of the letter re:Yeheb-nut. It looks good, here's hoping there is a response.

I have another contact in the Zimbabwe Botanical Gardens who I will be writing to shortly in order to obtain some Sahelian species for my new project, Sahelian Edible Landscape.

Apparently the Director of these gardens likes correspondence and a friend of mine from the Ag. Dept in Meekatharra gave me his address.

Another address I noticed in the Australasian Tree Crops Sourcebook was a contact in Sudan, who I might also write to. I think I'll throw in a couple of

American dollar notes in the letter as a gentle persuader to reply and to cover their postage (I hope it doesn't make them think I am rich, and have them charge me a fortune for the seed).

Yes, *Cornucopia* is a good book, this is one you don't have to sell me. I was so impressed when I came across it last year I purchased two copies from the publisher. I'd even looked at the Yeheb-nut in it and didn't even think of locating its seed source!

I was surprized to see Vaughan's Wildflower seeds and *Nindethana* in the resource section (I supply bulk lots of Native Seeds to them). We used to do a lot of seed picking before the nursery became so demanding.

I might even go through *Cornucopia* again for alternative Sahelian seed sources. I wish I had enough money to go

over there and collect my own seed. One day!

Another species that I'm after is Sunhemp, *Crotalaria junea*. I haven't been able to locate it in Australia, have you seen it anywhere?

The Vetiver grass is doing really well, we have planted a heap out and have a stock 120 plants always under division in the nursery.

I got hold of Frank Jordan re Pitaya and have some cuttings on the way...

The nursery is doing really well at the moment with 22,000 farm trees and lots of dryland fruit trees coming along nicely — Acerola, Ceylon Hill Cherries, Purple Mombins, Emblic, Nance, Kei Apples, Phalsa, and Natal Plums. In a week or two I am having a fresh kilo of seed of Neem trees sent over from the Weipa plantation (I think) so I'll let you know how they go when they arrive.

— **Julie Firth**, Yilgarn Traders, Lot 12 David Road, Waggrakine, Geraldton WA 6530 (Phone 099-38 1628)

For Sale Fodder Trees

(6 inch pots; 40c each)

200 Acacia saligna

50 Honey Locust

200 Carob

200 Tagasaste

Also: 300 Carob in tubes, 25c ea.

Contact **DAVE MYNOTT**

447 1181

BOOKS

on Useful Plants, Nuts, Exotic fruits, Tree crops, Permaculture, Organic growing, Farm trees, etc.

Best selection in Australasia — drawn from world-wide sources

Efficient mail-order service

Contact us for free lists

HIGHLIGHTS FROM OUR 'NEWLY-ARRIVED TITLES' LIST

532B • BETTER FRUIT Growing (Aus, 1991). 64p. Pb. Beautiful little booklet, surprisingly wide coverage, exc. colour photos, and only \$3.95!

519C • CORNUCOPIA, a Source Book of Edible Plants. Facciola (US, 1990). 678p. Pb. Stupendous, unique, all-embracing compendium of 1000's of edible plants worldwide, comprehensive variety listings, global supply sources. Very highly recom., indispensable for plant introducers. \$55.95

V115 • The GLOBAL GARDENER: Gardening the World back to life (Video, Aus, 1991). 120 min. Bill Mollison's inspirational presentation of Permaculture worldwide, in cities, cold climates, the tropics, and arid lands. Highly recom. \$49.95

514G • GO Native WILD FOOD COOKBOOK. Sked (Aus, 1985). Excellent cookbook on Australian native foods, many bunya recipes. \$9.95

B41N • NEEM: A Tree for Solving Global Problems. BOSTID (US, 1992). 141p. Pb. Exc. review of the outstanding potential of neem for safe natural insecticides, reforestation, industrial products... \$25.35

530T • TREES & Shrubs of the SAHEL: Their characteristics and uses. Maydell (Ger, 1990). 525p. Pb. Superb survey of useful trees of semi-arid N. Africa, with uses, site needs, propagation etc. Highly recommended. \$83.45

517U • UNCOMMON FRUITS & Vegetables: A Commonsense Guide. Schneider (US, 1990). 546p. Pb. 'An encyclopedic cookbook of America's new produce... over 400 recipes'. Acclaimed. \$28.95

Mail: PO Box 27 Subiaco 6008
Phone 09-385 3400; Fax 09-385 1612
Office: WA Gardener Building,
Showgrounds, Claremont



Granny Smith's Bookshop

West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

EXECUTIVE COMMITTEE 1992

David Noël (President)	385 3400(W)	381 7341(H)	Amos Machlin	389 1180
Matt Bruekers (Vice-President)		291 6210	Bill Napier	399 6683(H)
Lorna Budd (Secretary-Treasurer)	458 5918		Milan Mirkovic	420 2341(W); 451 3144(H)
David Brown	381 8208		Pat & Bill Scott	397 5892
Alex Hart	490 1324		Alex Sheppard	451 3144(W); 446 2316(H)
Bob Haywood	097-577597		Neville Shorter	450 5606

ACTION GROUP LEADERS

CHERRY: Neville Shorter, 450 5606 (2/9 Clydesdale St, Como 6152)

FIG: Alex Hart, 490 1324 (71 Terence St, Gosnells 6110)

JUJUBE: Ian Fox, 354 3131/H, 380 2571/W (15 Stringybark Ramble, Willetton 6155)

MACADAMIA: Wilf Prendergast, 384 3047 (PO Box 291, Claremont 6010)

PECAN: Amos Machlin, 389 1180 (19/3 Park Ave Crawley 6009)

PISTACHIO: Tom Bateman, phone tha (PO Box 315, North Beach 6020)

POMEGRANATE: Marius Loeffler, 097-33 5220 (P.O. Box 22, Yarloop 6218)

CALENDAR OF FORTHCOMING EVENTS

- 1992
- May 20 Wed *General Meeting (Hans Schoof — Soil Fertility & Tree Crops
— Organics/ Synthetics)
- May 31 Sun WANATCA Field Day, Mandurah
- Jul 7 Tue Executive Committee Meeting
- Jul 12-24 §Hills Orchard Improvement Group Tour of Tasmania/Victoria
- Aug 2 Sun §Landsdale Seminar — Growing Fruits & Nuts
- Aug 19 Wed Special General Meeting, Horticulture at the University of WA
— Meeting held At The University
- Sep 11 Fri §Karragullen Horticultural Field Day
- Sep 26- Oct 3 Perth Royal Show, Claremont
- Oct 13 Tue Executive Committee Meeting
- Nov 6-8 §Horticultural Spectacular, Claremont
- Nov 18 Wed *Annual General Meeting

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

§ For contact details refer to the Tree Crops Centre

Current Subscription Rate: \$40.00 per year
(includes all publications for the year). Student Rate: \$20.00

Quandong is produced by the Tree Crops Centre, PO Box 27, Subiaco, WA 6008.

Phone: 09-385 3400. Fax: 09-385 1612.

Advertising Rates: Whole page, \$80; Half page, \$45; Quarter page, \$25;

§ Eighth page, \$15. 20% discount for 4 insertions