



Quandong

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

Second Quarter 1994

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20th
YEAR OF
ISSUE!!



All measurements in mm

Fig. 78. EBENACEAE. A - *Diospyros bundeyana*, A₁ flower, A₂ berry. B - *Diospyros ferrea*, B₁ flowering branch, B₂ flower, B₃ berry. C - *Diospyros maritima*, C₁ flower, C₂ berry.

NEXT MEETING

Wednesday May 18: 7.30 pm

Our main speaker at this meeting will be **Frank Ellis** of Creative Land Management, who will talk on:

Improving Soil Productivity for Tree Crops

Frank's company produce and sell a unique range of growth enhancement products, including 'Biopac' microbes, 'Neo-Min' powdered rock additives, and 'Harvest' organic fertilizers. Find out all about it!

This meeting will be at our usual venue, the Greening Western Australia office at 1118 Hay Street, West Perth. **Full details on the attached leaflet.**

No charge to attend. Visitors Welcome. Queries to Tree Crops Centre on 385 3400.

"Tomato plants grown organically were found to contain twice the phosphorus levels of tomatoes fed chemically, in addition to 300% more potassium; 500% more calcium; 600% more cobalt, boron and sodium; 1200% more magnesium; 5,300% more copper; 6,800% more manganese, and 193,000% more iron than the chemically fed plants.

"Spinach contains 32% more iron when grown on composted soil, organic wheat 40% more thiamine (B1), vegetables 50 to 80% more vitamin A and oats 28% more protein.

"Organic food is better for you because the nutrients it contains are present in greater amount, are higher in quality, are better

absorbed by the body, and are present in the right proportions for healthy growth.

"It is interesting to note that 50kg of soil in which micro-organisms and earthworms have been killed by chemicals and sprays cannot hold more than 30 litres of water, but 50kg "living" soil, filled with humus can hold up to 95 litres of water. Food grown on this kind of soil definitely has a much more delicious flavour, goes further and satisfies the appetite."

— *Creative Land Management*

(Promotional literature)

About the Cover

Our cover illustration is from *Flora of the Kimberley Region*, edited by J R Wheeler.

For further details see the review of this book on page 18 of this issue of *Quandong*.

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WA PECAN GROWERS GET OVERSEAS STUDY GRANT

Prominent Collie pecan growers Bernie and Cheryl Rochester have been awarded a major government grant towards the cost of an extensive study of U.S. pecan production.

The grant was obtained as a result of an application made by the Tree Crops Centre on behalf of the WA Nut and Tree Crop Association.

Pecan production in WA has begun to take off in recent years, and while still tiny by world standards, the Rochesters are currently the State's leading producers of this delicious nut.

Leaving WA on June 3, the Rochesters will first be attending a Pecan Orchard Management Shortcourse at New Mexico State University. They will then go on to consult with growers, university experts, and machinery suppliers in Texas, Oklahoma, and Georgia.

The United States is the native home of the pecan nut, a type of hickory which is also a cousin of the familiar walnut. The U.S. is still the major producer and origin of most cultivated varieties, many of which were developed in the U.S. Government's Pecan Research Station at Brownwood, Texas.

There are two distinct types of pecan growing area in the U.S. Growers in Oklahoma and Georgia experience wet summers and mostly use natural rainfall. Those in New Mexico and west Texas have dry summers and depend on irrigation.

Because conditions in WA parallel those in the irrigated areas of the U.S., the Rochesters will be concentrating on orchard production for those areas.



Cheryl and Bernie Rochester look forward to their trip

Recommended pecan varieties for the two areas also differ. For example, 'Desirable', the leading humid-summer variety, has good resistance to the Pecan Scab disease which occurs in humid areas.

However, 'Desirable' does not perform well in arid areas. The leading varieties there, also recommended for WA, are 'Western Schley' and 'Wichita'.

Harvesting and processing (de-hulling, drying, and cracking) are similar for both areas. The Rochesters are currently awaiting delivery of a pecan harvester from the U.S., in time for this year's June harvest.

The total cost of around \$20,000 for the 5-week study tour was financed half by the Federal Government's Horticultural Research and Development Corporation and half from local WA sources.

Information resulting from the trip will be published by the Tree Crops Centre. **Y**

Your underground fertilizer factory

One of the major achievements of organic growing and permaculture has been the demonstration that the volume beneath the fruiting tops of plants can be turned, through encouragement of soil and mulch-living organisms, into a powerful fertilizer factory. This factory can feed and nurture plants in economical, stable, and sustainable ways far beyond those possible by bringing in industrial fertilizers. Following on the theme of our next meeting, this issue of Quandong will have several extracts on this topic.

Don't Plant Trees! (Plant Micro-Ecologies)

The main characteristic of trees which makes them so vital in any rational land use scheme is that they are longer-lived, perennial instead of annual. They have necessarily evolved to survive and make use of not only the whole year, but also a whole range of years. Annual crops are necessarily 'catch crops', which have to have the *right conditions* now, this very day, for successful sowing and germination.

By contrast, trees have evolved to use the whole spectrum of the year's conditions, and the whole range of a cycle of years, dry ones and wet ones, hot ones and cold. So they are a lot tougher and more tolerant than the typical annual crop. They also harvest from the available energy through the *whole year*.

The consequence of this is that annual crops almost always need some form of stored energy applied, whether as fertilizer or as the product of fallowing or the like, for successful yields. Modern agri-business uses chemical fertilizers.

Perennial crops, in contrast to annual crops, can be energy-budget positive. They can continue to grow and thrive without the application of external stored-energy products, and can even continue to do so while donating energy elsewhere. Thus, in some developing countries, it has been demonstrated that field crops can be successfully fertilized by the use of plant litter

from adjacent forests without this having any detrimental effect on those forests.

The conventional approach to plant introduction is one which I have called the 'top-down' method of selection. That is, start by choosing the *variety of fruit* you want to produce, and get any available rootstock to go underneath the fruit to hold it up and feed it.

This method is highly selective as far as the whole ecology of the tree is concerned. It tries to pick out the best bits of the ecology, usually a desirable-quality fruit, and run it without thought for the rest of the ecology.

In the introduction of new tree crops, I advocate the use of the 'bottom-up' approach. That is, find plants (of the species you are interested in or a close relative) which will *grow well under the conditions you already have*, and only when you have done that, move toward the fruit type you desire through grafting on or crossing with the good-fruiting types. The point is that by using your local conditions as a selection mechanism, you automatically incorporate more of your local ecology into the plants you press on with.

But often the biggest gain of the bottom-up approach is with regard to your soil ecology. Your sub-surface ecology is at least as complex as that above the surface, but it is hidden from view and so it's much harder to appreciate what is going on. Lack or excess of particular trace elements, variations in drainage and buffering capacity, and presence or absence of whole micro-ecologies of soil organisms can have dramatic effects on plant growth.

Interaction of plants with soil microorganisms is an area where we are finding out more and more, and realizing more and more how very little we know. Perhaps the longest-known aspect is that relating to nitrogen-fixing bacteria, identified as symbiotes with many leguminous plants.

More recently, other quite different nitrogen-fixing symbiotes have been recognized with casuarinas (sheoaks), alders, and heathers. Other soil symbiotes aid in other ways, as in making phosphorous more available. It is possible that all vigorous and pioneering species of trees are dependent on good symbiotic relations with soil organisms.

We are just now making a beginning in consciously exploiting these relationships, which are especially important with newly-introduced species. With many leguminous trees, and a few from other families, it is now possible to get microorganism inoculants to plant with the new trees.

I have a suspicion that microorganisms already present in soils may be able to adapt to become symbiotic with new species, particularly when those species are related to ones already present. If this is so, there is a case for including local relatives on the same site as new tree crop species, and to add in soil from around examples of the new species previously established elsewhere; this may already contain adapted symbiotes.

With all these acts, we are recognizing that the tree we are planting as our 'target' crop is only a small part of a wider ecology, and that if we can put as much as possible of the tree's micro-ecology in the ground with it at the same time, we are likely to get a far better result.

— David Noël

[A much-condensed version of an article in *Western Permaculture Manual*, edited by David Brown (Cornucopia Press, 1989)]

Dicing with Life

The Association is now developing an ambitious research project to promote the Domestication, Introduction, Commercialization, and Exploitation of a big range of lesser-known perennial plant species. The researchers will be WANATCA members themselves.

The intention is to offer all members the opportunity to participate in a new WANATCA group, provisionally named the DICE Group. The DICE leadership will obtain an ongoing range of seeds and propagation material of species believed to have development prospects.

These seeds and material will be distributed to DICE Group members without charge. The members will be expected to use their best efforts to raise the new species and report on their results. These results may be summarized in a special supplement published with *Quandong*, or elsewhere.

Members will not choose specific seeds

from a list, instead they will be sent seed, selected by the group leadership, according to their general growing conditions and expressed preferences. Hundreds of species are known to be suitable for DICE treatment, and suggestions will be welcomed for more.

WANATCA intends to run this scheme as a research project, and apply for R&D funds as appropriate in addition to using its own Research Fund.

Suggestions and comments on this project will be welcomed. In the first instance, contact David Brown on 381 8208 or c/o PO Box 565, Subiaco WA 6008. Invitations to participate in DICE will appear later.

MACADAMIA FIELD DAY REPORT

The macadamia Field Day held near Perth on February 28 was popular — 160 people attended. Everyone was there who said they would be.

Three buses headed off to Tony Perrella's property in Herne Hill where we heard from Tony how and why he started growing Macadamias and the problems he encountered. His 500 trees are 6-7 years old and beginning to bear.

You will no doubt be saying but I thought they were supposed to bear from 5 years old...Yes they do. Tony's trees were not fertilized for the first two or three years due to incorrect advice. At that point Doug Johnston took them over and started a fertilizer programme.

The trees had been mulched with mushroom compost which is the Rolls Royce of mulches. However it was pointed out that the base of the trunks were covered. It is most important to keep the mulch away from the trunk if only by 8 cm and then apply it deeper out to the dripline. The reason... to stop collar rot and canker on the trunk and to encourage the feeder roots to grow outwards.

A selection of drippers and sprinklers were demonstrated. There was a bit of a wind and there were a few wet trousers but the exercise was well worthwhile. Thanks to the wind which most of WA experiences in the summer, it was obvious to everyone that fine microsprays were very efficient at watering the grass between the trees. These were quickly crossed off the list. Drippers generally do not cover a big enough area for effective growth. The most popular umbrella emitter was the octo-dripper which is adjustable from a dribble to a 40L/hr, 500mm radius. This has click adjustment so does not unwind itself when you're not looking and is ideal for the first 5 years or so.

Microsprinklers of the spinning rotor type can replace the octodripper quite easily at a later date. These are more effective between older trees where they can water the root zones of two trees. The final message was always use a filter of an appropriate type for your situation.

Next Stop...Alan Stockdale's property at Ellenbrook. This plantation has been in the ground for 2 months. It was planted late due to site problems..late rain and therefore inaccessibility. The area was prepared by the text book. A dozer, a grader, a scraper, drainage and an efficient irrigation system. The soil varies from sandy loam to clay.

1000 trees set out at 8mx4m cover about 4 hectares. They have barely put their roots into the ground but are doing well considering the time of year they were planted. A comment made by me was that every day was too frequent to water given the nature of the soil. Every other day would be quite sufficient and I really think they would grow better.

On the wetter, heavier soils Alan has had gentle mounds made by the grader to elevate the trees and shed excess water. These mounds should be gentle to enable mechanical harvesting under the trees. Again I hear you say....but you said well drained soil is essential ...yes it is. Alan made a decision to try this area, which is not too big, and give it the treatment he has to see how it goes.

The other interesting point on this property is the windbreaks that were planted probably 10-15 years ago. The layout divides the plantation into sections which will provide protection for the Macadamias. The actual design and species used could be improved.

John Forrester gave a tree training demonstration. He stressed the importance of apical dominance which simply put means pruning the young tree to promote one main leader. The reason for this is to provide a solid main trunk and smaller laterals which if broken in a storm or strong wind will not destroy the whole tree. It also has relevance to the ultimate shape of the tree and its yield.

The last stop was at Tim Lynn-Robinson's property in Chittering where we were treated to some 18 year old trees producing around 25kg nut in shell. Tim is very keen for us to develop some WA trees from those that have done well consistently. Some of these are not identifiable and may prove to be worth pursuing. This will take a considerable amount of time and scientific monitoring.

Tim is not afraid of experimenting and lateral thinking as far as Macadamias are concerned. This is vital to our continued growth and development. As I have no doubt said many times before...we have all the tools of trade available to us to develop a very high quality industry here in WA. It is just a matter of fine tuning and disciplined management. Tim is the sort of person we need who is not afraid to have a go.

The day ended with a question and answer session which was very enlightening. Points that were raised included someone who knew of mature trees growing in a moderately low rainfall area without water for 4 years and bearing a good crop; trees that are growing on 4500ppm of salt in the irrigation water [some have died and the plantation is only young] but interesting; one grower only waters once a week but heavily; which is the best variety to grow here? John Forrester said something to the effect that it depends which way the wind is blowing!! i.e.

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THE tree presents itself and is hailed as THE one only to be overtaken by another one. There is nothing totally conclusive about any particular variety.If you want the opinion of the majority of people I have spoken to it is 344 and 246. This is from my observation too.

However on Geoff Stuart's plantation all varieties are growing well. There are many factors to consider.

And so the day ended with tea, coffee, beer, wine, cheese, biscuits, cake and of course Macadamia Nuts! The biggest problem was getting everyone to leave!!

— John Cory

[Fruit Gardener (California Rare Fruit Growers) / February 1994]

Jungle Underfoot

The complex ecology of fungus, bacteria, algae, worms and assorted insects and rodents inhabiting the soil is directly responsible for its fertility and ability to support higher plant life.

In the course of decay, which is brought about by microorganisms, carbon bound up in plants and animals is released in a process called "mineralization." In an environment of excess food, microbes multiply. These live and die and decompose as they release nutrients to the soil. The primary nutrient released is nitrogen.

In addition to carbon dioxide and nutrients, the breaking down of organic residue creates heat, water and humus. If the process is carried out to the very end, when there is no more available carbon to be consumed by the microbes, about 1-5% of the original residue ends up as humus.

Examining the Invisible

These often invisible life forms active include bacteria, fungi, algae, protozoa, nematodes, actinomycetes and earthworms.

Bacteria: These are microscopic plants having round, rodlike, spiral or filamentous single-celled or noncellular bodies. There are about a billion bacteria to every gram of soil. They live in all conditions and it is estimated that there are 400 to 4000 pounds of bacteria to every acre of soil.

They are so vital to the soil because they break down the complex organic matter that we call "plant residue" and turn it into humus. They also are almost exclusively responsible for three basic soil processes: nitrogen oxidation (nitrification), sulfur oxidation, and nitrogen fixation.

Actinomycetes: These are also known as

thread bacterial. These are usually beneficial or neutral, but a few species can be harmful to our crops. Actinomycetes are most often found in soils high in humus.

Fungi: A fungus is a lower plant that lacks chlorophyll. These life forms can be found in amounts ranging from 800-8000 pounds per acre. Fungi, having no chlorophyll, cannot photosynthesize, they live entirely off organic matter in the soil.

Mycorrhiza is the symbiotic association of the mycelium of a fungus with the roots of a seed plant. Mycelia are the mass of filamentous threads (hyphae) that forms the thallus, or vegetative body of the fungus. In mycorrhiza, these fungal threads penetrate the root cortical cells of host plants (always a seed plant) and this interaction profits the plant as well as the invading fungus.

The mycorrhiza expands the affected plant's root system enabling a greater uptake of soil nutrients and this promotes increased vigor in the plant. In turn, the plant is therefore able to produce a greater amount of carbon, which in turn feeds the mycorrhiza. Mycorrhizal-associated plants are known to suffer less water stress during drought. Instances have occurred in which a plant species transported to a non-native location of similar climate failed to thrive until native soil, plentifully supplied with the correct species of fungus, was brought in.

Economically important tree species that are known to have mycorrhizal associations include maple, apple, cocoa, coffee, citrus and rubber.

Algae: Most algae contain chlorophyll and require sunlight to perform photosynthesis although a few species live off organic matter below the surface horizon. Algae, blue-green algae in particular, are important because they are able to take

nitrogen out of the air, although it is available to plants only after the algae dies.

Protozoa: These are the most numerous and varied of the soil microorganisms. As many as 40-50 species can be found in a single sample of soil. Protozoa ingest bacteria and other microflora and it is believed their activity hastens the turnover of available nutrients, especially around plant roots.

Animal Life in the Soil

Nematodes: These microscopic animals, often called threadworms or eelworms, can either be harmful or beneficial to our gardens, depending on the species and their feeding habits. They are wormlike, unsegmented and invertebrate, and there are about 15,000 known species, of which about 2200 species are harmful. Most of these chew on the root systems of our plants, handicap their ability to take up water and nutrients and open wounds that invite disease.

Earthworms: These creatures are extremely important organisms in terms of soil formation. The amount of soil these creatures pass through their bodies annually may amount to as much as 15 tons/acre of dry earth. During the passage through the worms, not only the organic matter that serves the earthworms as food, but also the mineral constituents are subjected to digestive enzymes and a grinding action within the animals.

Results in Action

As the result of all these life forms working together in the soil, carbon bound up in plant residues is broken down in a process called "mineralization." In addition to liberating nutrients such as nitrogen, the process also creates carbon dioxide, more microbes, water and ultimately, humus.

— Alice Ramirez

[This is a small extract from the original article. Complete copies are available as Leaflet L60J, 'Jungle Underfoot', at \$2.00]

WANATCA gains first overseas life member

Our first overseas member to take up the Life Membership option is Dianne Hand of California.

Dianne is active in the California Rare Fruit Growers, the producers of the excellent magazine from which the 'Jungle Underfoot' extract was taken. She receives the exchange copy of WANATCA publications under our agreement with the CRFG, and has been most helpful in noting our activities and news in the California publication, which has world-wide influence. She writes:

"My nerves are slowly calming down after the January 17 earthquake. Although I am only 6 miles from the epicenter of the quake, I was fortunate that very little damage was done to my house structurally. I get up at 4.15 each morning so that I have time to do some writing in peace, and was in the kitchen when the temblor struck. The destruction around the area is incredible, and there are areas fifteen or twenty miles from here that are devastated over a wide spread area.

I doubt that I will ever forget the sight of the California State University, Northridge parking building, buckled in three directions by the force of the ground movement.

Three of the freeway collapses are within five miles and that has meant a lot of extra traffic on the surface streets in our city.

One thing for dam sure, whenever I read of earthquakes hitting other parts of the world I shall have a great deal more empathy for the people involved. I felt for the people in Sydney during their terrible fires. We know how frightening that experience can be. Aside from a plague of locusts, I think California has experienced about as many natural disasters as there are to deal with."

Please, Pass More Information

At the February 16 meeting of WANATCA, the large crowd were treated to a wealth of information from local media star and rare fruit nurseryman Neville Passmore.

Neville Passmore opened his talk with a twinkle in his eye, saying that this was a topic close to his heart: he loves eating exotic fruit. He brought a nursery trolley loaded with specimens and presented them one by one to the rapt audience.

Shahtoot Mulberry. This mulberry has a long, slender amber fruit that is sweet, juicy and tastes like an apricot. This pale berry has the advantage that it does not stain. This is a very tough, hardy tree that originates in the mountains of Iran. It is a fire-retardent, deciduous tree that would be useful planted on the north side of a house. There is also a red form, although it is scarce and little-known. The red form has a different leaf shape, a bit like a fig.

Ice Cream Bean. *Inga edulis*, has an unusual leaf shape. The pods are large and resemble poinciana pods. When the pods start to split, they can be opened. A fluffy, white, sweet and succulent material covers the black seeds. It is a tropical legume, but has survived very well in Perth. It grows fast, ten to fifteen metres in four or five years. It has pretty flowers, and comes into bearing early.

Jaboticaba is a member of the myrtle family from South America. It is a beautiful shrub that grows to about three metres in height. Fruit forms right on the main stems like big, black grapes. The skin is thick and fruit flies cannot penetrate it. It is a slow grower, but once it begins flowering, the season is long, flowering and fruiting sporadically throughout the summer. It is a popular street fruit in Brazil.

Kaffir Lime, Nakrut Lime. Australia imports \$2 million worth of dried lime leaf every year. It is used in Asian cooking. The

fruit is small and knobby and is also used in Thai cooking. It is a tropical citrus and probably needs a special warm spot in Perth gardens. Long spines give it potential as a security hedge. It is susceptible to some diseases. It is available at Waldecks, Gosnells, budded onto Citronelle stock.

Sapodilla, also called Sawa, Chiku or Caramel Fruit is a successful tree in Perth. It was cultivated early in this century as a basis for chewing gum. (Phil Ciminata contributed some information.) The American varieties are not as sweet as Asian ones. It is a tropical tree and can grow to the size of Moreton Bay Figs in Bengal. It has some pollination problems so it is probably best to plant three or four. John Verheyen has a large orchard in Gingin. He has had trouble selling the fruit, but this is probably a marketing and education problem. The fruit look like potatoes with sandpapery skin. His trees are eight years old, three metres tall and bushy and loaded with fruit.

Wampi is a member of the citrus family from Hong Kong. It is an attractive tree that bears little yellow berries with jade green seeds and a sweet, watery pulp.

Feijoa. There are probably hundreds of feijoas in Perth, grown mainly for their large attractive red and white flowers. Many people do not realise that the green fruits are edible. Even fewer know that the fleshy white part of the flowers is sweet and edible, an interesting addition to fruit salads. This is a tough, cold-hardy plant from the mountains of South America. The New Zealanders have chosen this as a species to develop and market. Some seedlings have a pollination

problem and it is probably best to plant several. Indeed, some individual plants seem not to bear fruit, ever. (Bill Scott commented that this is a plant that kangaroos don't eat.)

Brazilian Cherry, Surinam Cherry. This is a member of the *Eugenia* (myrtle) family, which also includes lillipillis and Eucalypts. The fruit is very variable and can range from sweet and delicious to very astringent. It is an attractive bush and the berries are colourful. It is very successful in Perth and fruits twice a year.

Capulin Cherry is a member of the *Prunus* family and a genuine relative of the European cherry. It is an evergreen tree that grows fast, like a willow, up to six metres in two years. It needs several trees to pollinate, and is a good candidate for a windbreak. The trees are spectacular when they are flowering with long panicles of white flowers, followed by cherries. The fruit has red or black skin and green flesh. It is an easy plant to control and doesn't sucker. It comes from a tropical part of Brazil.

Barbados Cherry. This is a tricky one to grow in Perth as it is very cold sensitive. It might be best in a pot so that it can be moved into shelter during the cold, wet winter. It has gorgeous pink flowers and the fruit is rich in Vitamin C, fifty times more so than oranges.

Coffee has beautiful, perfumed white flowers, and is very ornamental. It is easy to grow. It is possible to process the beans to make coffee, but it is quite complicated and a challenge.

Pomegranate. There are many selections now available. The top performer is probably "Galosha Rosavaya." This is another tough, hardy plant from the mountains of Iran that can handle conditions from snow to 40



Neville Passmore among his nursery plants

degrees, hard soil and drought. It has ornamental orange flowers. The fruit is ready to pick when it "smiles," that is, begins to crack open. The fruit can be rolled on a hard surface to crush the cells inside, then insert a straw to drink the juice. The juice is used for tanning Moroccan leather. Some people use it medicinally to kill worms in children. The plants are easy to start from cuttings.

Pistachio is not too good in Perth as the winters are not cold enough. It has potential in the wheatbelt. It is handsome and tough, and there are a few low chill varieties.

Longan is a success story in Gosnells, beginning to bear early and prolifically. It may have a biennial pattern. The berry is

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Brian Money

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covered with a thin brown skin and has translucent, white, sweet flesh. Neville gorged on longans for two days in Cairns, and found that he began to smell like longan.

Mango. In India there are more than one thousand named varieties. There are many different flavours and textures, colours and shapes. Colour is often dependent on temperature. In Cairns and other humid places, mangos suffer from severe fungal diseases. The familiar Kensington Pride or Bowen mango is one of the best. It is easy to grow from seed as it is polyembryonic; four or five seedlings will come up, all basically identical to the parent.

Bunya Pine is native to southern Queensland and northern NSW. It is a dangerous tree as it is large and spiny and can drop 10 kg cones from a height of 20 metres. The nuts are rich and delicious, and in demand at Bush Tucker restaurants.

Tropical Pear is just that. It does well from Perth to Carnarvon and doesn't require as much cold weather as ordinary pears.

Candle Nut, Aleurites is a Pan-tropic tree that does well in Perth. The nuts are very oily and can be burned like candles. They are

also used in Indonesian curries.

Avocados. Surprisingly, many people still are not familiar with them and haven't tasted them. Some public education might be in order; it is possible that many people don't understand how to know when the fruit is ripe.

Nashi, Sand Pear, Asian Pear. There are many varieties of different shapes in China. Most Australian cultivars come from Japan. They need pollinators.

Some trees which are too tender to grow in Perth include Rambutan, Durian, Mangosteen and Cashew. Neville commented that he was always learning new information about exotic trees. It often happened that when he spoke to an audience about some new, unknown plant that someone would get up and say, "I have one of those and it is covered with fruit."

Neville concluded by mentioning Grobrite All Purpose Fertiliser. It is organic and high in potassium. Fruit trees have a need for potassium. He also showed us a sprayer which snaps onto a garden hose and dispenses diluted foliar fertiliser.

— *Pat Scott*

[Information from an expert panel at the same meeting will appear in a later issue of Quandong]

LOEFFLER PROPERTY HIT BY FIRE

The Yarloop property of Marius Loeffler, WANATCA's Pomegranate Action Group leader, has been hit by a devastating fire.

One of the Association's stalwarts since 1981, Dr Loeffler was responsible for setting up the Pomegranate Action Group in 1988, and had built up an unrivalled variety trial, including some introduced from the Middle East and Azerbaidjan in the former USSR.

He also had planted hundreds of other nut

and fruit producing trees, and had done a great deal of work on revegetation and erosion control using species like poplars and elephant grass. Many of these were seen by members during a WANATCA Field Day on the property in 1988.

In recent years the property had been developed to the state where the majority of trees were well-established and producing.

The fire, ascribed to the downing of an SEC power line, represents a significant setback to the advancement of tree crop culture in WA. Our profound sympathies to Marius on his loss.

Help Needed at the Tree Crops Centre

There has been a pleasing increase in WANATCA membership numbers and activities over recent years. However, this has also meant a large increase in activity at the Tree Crops Centre in Claremont, which acts as the Association's Headquarters.

David Noël, in his capacity as Director of the Tree Crops Centre, is appealing for offers of help from WANATCA members or their families. Ideally, he would like offers from older people with business or office experience, able to put in one or more half-days a week, and perhaps longer when he is away from Perth.

There is some reimbursement offered, and also the opportunity to use the Centre's business equipment (computers, fax, copier) for your own purposes. Obviously an interest in, and some experience with, tree crops would be a great help. There is good train access to the office, which is in the Claremont Showgrounds, but someone living in the Claremont/ Nedlands/ Shenton Park area would be the most likely to find helping out convenient.

At present the Centre is staffed 10am to 5 pm, Monday to Friday. If you can offer help or suggestions, please contact David on 385 3400 between those hours.

[Countryman / March 24 1994]

Arrowleaf inoculant trebles early growth in clover species

The WA Department of Agriculture has selected a new strain of rhizobial inoculant for Arrowleaf clover which trebles the early growth of the plant.

Dr John Howieson, subprogram leader with the Centre for Legumes in Mediterranean Agriculture (CLIMA), collected the new strain on the Greek Island of Serifos in April 1993 while on long-service leave.

The new strain (WSM 1328), packaged as a special "Arrowleaf" inoculum, will be available from retailers throughout Australia this year. It replaces the previously recommended Group B inoculant.

Arrowleaf clover is emerging as a potential clover for soils which store water

below the depth normally reached by the roots of traditional species such as subterranean clover. In the past, early season growth of Arrowleaf clover has been slow.

Dr Howieson said he believed part of the problem may have been due to nitrogen deficiency arising from poor nodulation. "The new inoculant is so superior to the old strain that immediate commercial release is justified," he said.

Y

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(in 5 litre bags, approx 50-100 cm high)

\$12-14 each

Philip Bloomfield

member WANATCA

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[Kansas Nut Grower News / 1993 Dec]

The 3-Flap Graft Revisited

Have you ever been faced with grafting 100 or more pecan or walnut trees with the 3-flap graft? After making my 20th graft of the day, I start thinking about ways to shorten the time it takes to make a 3-flap graft. Do I really need aluminum foil? What about the plastic bag?

A couple of years ago we ran a study at the Pecan Experiment Field to test different methods for wrapping a 3-flap graft. The purpose of the study was to see if we could speed the grafting process while maintaining a high percentage of successful grafts.

We compared the traditional method of wrapping a 3-flap graft with green plastic grafting tape, aluminum foil, and a plastic bag to four other methods. These methods were:

1. Wrapping the graft with 1/2 inch wide blue (or any dark color) flagging tape only. This plastic tape is similar to the green grafting tape but is thinner and blocks out all light.

2. Wrapping the graft with blue flagging tape then and covering the graft union with Parafilm. Parafilm is a waterproof film that stretches to twice its length and adheres to

itself. I think of parafilm as grafting wax that comes in sheets.

3. Wrapping the graft with a white adhesive cloth tape. This tape is similar to the tape used for wrapping medical bandages.

4. Wrapping the graft with white cloth tape and covering the graft with parafilm.

One hundred and ten trees were grafted using these wrapping methods, including 75 Giles trees and 35 KS112 trees. I recorded the time it took for me to complete the graft and the percentage of grafts that were successful.

While grafting I made the following observations. The white cloth tape was difficult to handle. I had trouble keeping the tape from sticking to itself or sticking to one of the flaps of the graft and pulling it out of place. The blue tape was easy to handle but for many grafts this tape did not hold the graft securely and became loose in the wind. The parafilm was easy to handle and provided a tight seal around the graft.

In reviewing the table of results given below, you will note that the traditional method of green tape, aluminum foil, and a plastic bag took the longest time to complete but gave among the best rates of success. Using tape alone, either the blue tape or cloth tape was quick but my percent success was very poor. Parafilm took only a few seconds to apply but proved critical to grafting

Method	Giles		KS112	
	Time ¹	% Success	Time	% Success
Green Plastic Tape, Foil and Plastic Bag	3:25 a ²	80 a	3:00 a	86 a
Blue Tape	2:11 c	7 b	2:07 c	29 b
Blue Tape and Parafilm	2:38 b	60 a	2:37 b	100 a
Cloth Tape	2:08 c	28 b	2:11 c	43 b
Cloth Tape and Parafilm	2:29 b	73 a	2:33 b	100 a

1. Time expressed as Minutes:Seconds

2. Numbers followed the same letter within a column are statistically similar.

success.

In conclusion, growers should continue using the traditional method for wrapping the 3-flap graft. The materials needed for this method are easy to find and relatively cheap. For growers faced with grafting over 100 grafts in a season, you may want to consider trying parafilm to cut grafting time. Parafilm is manufactured by the American Can Company, Greenwich, CT 06830.

[In Australia, Parafilm is available from Sigma-Aldrich Pty Ltd, 10 Anella Ave, Castle Hill NSW 2154.

Personal callers at the Tree Crops Centre can get a 1 metre x 10 cm sample of Parafilm (enough for up to 100 small buds) for \$2.]

Mature Olive transplants offered

WANATCA member Ian Mayer intends to remove a row of mature olive trees from his orchard in Araluen in the Perth Hills. He offers them to members on a swap basis.

The olives, believed planted in the mid-1950s, are 2-7 metres tall. Olives are very tough and transplanting is not difficult — Ian has already sold a number of trees as landscape garden specimens.

The olives are to be removed in the next few months as a replanting exercise. Ian intends to plant small macadamias and pecans and would be interested in a swap for specimens of these.

Please contact Ian on 09-222 3631 (work) or 399 6307 (home) if you would like some of these mature, fruiting trees.

Letter from Murray Gomm

As discussed, below is a list of trees that have performed extremely well on the 1-1.5 metres of pure white sand found in the Albany region (rainfall about 850 mm/year). Over a 10-year period, my parents have determined what will and will not grow.

Most of the Goldfields and Wheatbelt trees have died, although these have been planted on ironstone/gravel country.

Anyway, the list is:

<i>Eucalyptus ficifolia</i>	Red Flowering Gum
<i>E. robusta</i>	Swamp Mahogany
<i>E. gomphocephala</i>	Tuart
<i>E. ovata</i>	Swamp Gum
<i>E. botryoides</i>	Bangalay
<i>E. grandis</i>	Rose Gum
<i>E. globulus bicostata</i>	Victorian Blue Gum
<i>E. saligna</i>	Sydney Blue Gum
<i>E. globulus globulus</i>	Tasmanian Blue Gum
<i>E. viminialis</i>	Ribbon Gum
<i>E. maculata</i>	Spotted Gum
<i>Agonis flexuosa</i>	WA Peppermint

I would be happy for this list to be published in *Quandong* for the benefit of anyone. Also, if anyone can add to this list for my benefit, I would be happy if they called me.

— *Murray Gomm*, 1/166 Middleton Rd, Albany WA 6330. Phone 098-42 1056 (work), 41 5354 (home).

For Sale

Quandong Seed

(*Santalum acuminatum*)

\$5.00 for 50

Seedlings \$5 each

Contact Jenny on 09-385 9595

[Rural Research / Autumn 1994]

Bacteria boost for Australian crops

Scientists at CSIRO'S Division of Soils in Adelaide have been negotiating with Chinese scientists to conduct a cooperative study into Chinese yield-increasing bacteria.

The bacteria, which are applied as a powder to seeds or seedling roots prior to planting, are widely used in China, with documented increases in yields of cereals, grain legumes, canola and cotton of 10-15%. There is evidence that the bacteria, which colonise roots and root surfaces, produce antibiotics and plant growth-promoting hormones.

Director of the CRC for Soil and Land Management, Dr Albert Rovira, who visited Beijing last year, is leading negotiations with the Chinese. The CRC is seeking funding from the Australian Centre for International Agricultural Research (ACIAR) to conduct the research in a quarantine greenhouse.

An ACIAR grant, together with input from the CRC, would enable two Australian scientists to visit Beijing Agricultural University for 'on the spot' assessment and to bring a Chinese scientist, together with the cultures of bacteria, to conduct the research in Australia.

The scientists are also keen to test a genetically-modified form of the bacterium, *Pseudomonas fluorescens*, which the Chinese have developed to combat the major root disease of wheat, take-all.

If an agreement can be reached between all the parties, the studies will begin in September 1994. For more information contact Dr Albert Rovira, (08) 303-8670.

Bunya Nut Notes

WANATCA is pleased to welcome new member Rex Parsons, from the Bunya Mountains in Queensland.

This area is, of course, the native home of the Bunya Pine, *Araucaria bidwillii*, Australia's own giant nut-bearing conifer.

The Parsons run holiday units in the mountains as a main occupation. But Rex is particularly interested in the use and potential of bunya nuts — he says he has harvested literally tonnes of the tasty nuts in the past.

Rex is in process of compiling a bunya nut recipe book. He is keen to trial different methods of propagation, and being right there on the spot, he is in an excellent position to look out for individual trees which bear early or have some other feature of possible commercial interest.

Rex can be contacted at Dandabah Holiday Units, Bunya Mountains via Dalby, Queensland 4405 — phone 076-683131.

Bunya a nitrogen fixer

The November 1993 issue of the New Zealand magazine Growing Today has an article on Stone Pine and Bunya Pine nuts. This contains the information that Bunyas are hosts to blue-green algae which fix nitrogen.

The same behaviour is noted in WA *Zamia* Palms (cycads) — a cross-section right through the plant and its soil shows a distinct green envelope surrounding the roots in established plants.

For Sale

Pecan Seedlings

Well grown in tall bags

\$4-5 each

Contact:

Alex Hart on 09-490 1324

71 Terence Street Gosnells 6110

Budding difficult tropical fruits

In the early part of this century, when the Philippines were under American control, the innovative and highly competent horticulturist P.J. Wester was stationed in the islands, and produced a number of extremely valuable publications.

One of these was *Plant Propagation and Fruit Culture in the Tropics* (Manila, 1920). Wester discovered that success in budding tropical fruits often depended on whether the leaf at the bud point had been cut off in advance, so the leaf stalk had fallen ('non-petioled budwood'), or whether the bud was used immediately, with the leaf-stalk still attached. Of the two classes of budwood used, the second was:

"those species in which it has been found essential to cut off the leaves of the budwood while this is still attached to the plant, some time in advance, say two weeks from the date of budding, in order to induce the dropping of the leaves and the formation of a well-healed leaf scar, such as cacao, mango, hevi, and

santol; scions so treated are referred to as non-petioled budwood".

A comprehensive list of tropical fruits is included, with propagation methods. Two examples:

Litchi. *Litchi chinensis*. Use non-petioled, brown-gray, mature budwood; cut the bud 3.5 to 4 centimetres long; age of stock at point of insertion of budwood unimportant.

Longan. *Euphoria longana*. Use non-petioled, bluish-green to turning brown, mature budwood; cut the bud 4 to 4.5 centimetres long; age of stock at point of insertion of bud unimportant. Congenial stock: Alpay (*Euphoria cinerea*). ¥

Vetiver Grass for Sale

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BOOK REVIEWS

by David Noël

Brunei Darussalam Fruits in Colour. *Serudin Tinggal*. Brunei, 1992. 148 pages, hardback. *\$89.95

This unusual, valuable, and impressive book is not the product of a commercial publishing house. Instead, it is an 'in-house' prestige production, dedicated to the Sultan of Brunei on the silver jubilee of his rule.

Brunei is the tiny, oil-rich independent kingdom on the north coast of the island of Borneo. It is noted for its wealth and superlatives — the Sultan's palace is perhaps the largest private building in the world — and this book is in the general trend.

A very-large format book (240 x 320 mm), it is crammed with superlative colour photos of the fruits and nuts of Brunei. Yes, there are plenty of good books with colour

photos of fruits, but not like this — the vast majority are unknown outside the immediate region, and to me represent unique pictures with no parallel elsewhere.

The author, Dr Serudin Tinggal, is an academic at the Universiti Brunei Darussalam, while the editor, and principal photographer, was Dr Bobby Tee of the Brunei Department of Agriculture. Some readers may remember Bobby Tee from when he was a keynote speaker at the ACOTANC-West Symposium in Perth in 1983.

Some 60-odd species of fruits and nuts are covered in the book, and the majority will be 'new to western horticulture'. As an example, six native species of mango with edible fruits are covered, apart from the normal mango — Bembangan (*Mangifera panjang*), Belunu (*M. caesia*), Rancha Rancha (*M. quadrifida*), Matan (*M. sp.*), Mangga Ayer (*M. laurina*), and Wani (*M. odorata*). No less than seven species of durian are described.

Then there are species with no well-known relatives — *Baccaurea* (5 species), *Dacryodes* (2), *Litsea* (2), *Pangium* (1), *Pithecellobium* (1), *Santiria* (1), *Tetrastigma* (1), and *Willughbeia* (1). For all these, notes on growth and uses are given, where known. But it must be borne in mind that many of these species are obscure even in Brunei, and for some, information is very scanty.

Because of the circumstances surrounding its production, this book has been difficult to obtain in Australia, even when its existence was known. The Tree Crops Centre is grateful for Dr Bobby Tee's kindness in arranging a special consignment of this book, at a rock-bottom price. While not cheap, this is an absolutely unique work, now available at a realistic cost. Highly recommended.



Pecan Cultivars: The Orchard's Foundation. *Darrell Sparks.* Pecan Production Innovations, Georgia, 1992. 443 pages, hardback. *\$86.95.

This is not just a book about pecan varieties, instead it is a comprehensive handbook to making use of all available pecan types to get the best results from a pecan orchard under given conditions.

The author, Prof. Darrell Sparks of the University of Georgia at Athens, Georgia, is well-known throughout the United States for his many publications on pecan physiology, performance, and behaviour as affected by local conditions and varieties used. This book is not an academic survey, instead it is an intensely practical compendium backed by years of scientific study.

Sparks is centered in the heart of the U.S. pecan belt, in the humid-summer eastern coastal regions, and there is a natural emphasis on those conditions. However, the western irrigation varieties are also well covered.

As well as complete descriptions of the place of all the modern cultivars, there are sections on the rationale and purpose behind pecan breeding and likely routes to obtain better varieties.

This book has been very favourably reviewed by Sparks' peers in the U.S. pecan industry. It should be invaluable for Australian use. It is of relevance that in the world review of pecan prospects which was reproduced in the 1993 WANATCA Yearbook (*Pecan - an Emerging Crop*), the

most limiting cultural problem identified for the Australian region, and for that region alone, was the lack of cultivars in use.

Flora of the Kimberley Region. Edited by *J.R. Wheeler et al.* Dept of Conservation & Land Management, Perth, 1992. 1327 pages, hardback. *\$89.95.

A massive and scholarly compendium of the flora of the Kimberley region, the most northerly and distinctive of WA's floral provinces.

Weighing almost 3 kilogrammes, printed with minimum margins, and well-illustrated with excellent line drawings, this book is of interest to tree croppers because of its coverage of WA native fruit and nut species which have all their botanical links with southeast Asia, rather than with southern Australia.

The book is arranged in normal botanical fashion, by plant family, and is as complete as modern botanical knowledge allows. I was most interested to read of all sorts of species, typically regarded as purely exotic to Australia, which have representatives within the state. I had not realized, for example, that there were 4 species of *Diospyros* (Persimmon family) native to the State.

Produced by the WA Government's department concerned with wild plants, it is clearly a subsidized publication — a commercial equivalent would cost well over \$200.

*Current price of copies from Granny Smith's Bookshop, PO Box 27, Subiaco WA 6008.



Red Pitaya fruits in Perth

The first Red Pitaya fruits have appeared on Perth plants, just two years after the supply of the original cuttings by Queensland WANATCA member Frank Jordan.

This event is a tribute to the hard work of our Pitaya Action Group leader Bob Nederpelt. Bob has worked tirelessly on this promising fruit, and for some weeks was getting up at 4.30 am each morning and travelling round Perth to hand-pollinate various fruiting cacti.

As well as the Red Pitaya itself, Bob has been working with other *Hylocereus* species — there are some quite large old specimens around Perth (see article on next page).

Others of Bob's cacti have also fruited. The photo shows fruits of the apple cactus, one of the *Cereus* species.



Apple Cactus fruit. The fruit shows the splitting which occurs if it is left on the plant too long when ripe

Question from Carol Gilbert

Do you know the botanical name for 'Dragon Fruit'? It is grown in Vietnam, but apparently WA exports some to Singapore.

Answer from David Noël

According to Bob Nederpelt, our Pitaya specialist, 'Dragon Fruit' is the fruit of the climbing cactus *Hylocereus undatus*. He thinks it most unlikely that WA exported the fruit to Singapore (the industry is still at a very young stage here), but he did initiate an enquiry with our Rural Innovation Centre to check out the possible Singapore market — maybe his enquiry was the source of your comment.

Apparently the fruit is called 'Dragon Fruit' because it is available for, and figures in, the Dragon Festival in Singapore. *H. undatus* is a pitaya with a red skin and whitish, translucent flesh. However there is some uncertainty still over *Hylocereus* species,

some varieties are possibly hybrids.

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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.

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Avowest Nursery, Carabooda

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[Subiaco Post / April 5, 1994]

LAST WORD ON THOSE LADIES OF THE NIGHT

This letter may help to clarify some of the observations by correspondents of the POST in the past three weeks.

There are a score or more night-blooming *Cereus*, *Echinopsis*, *Epiphyllum*, *Espostoa*, *Harrisia*, *Hylocereus*, *Marniera*, *Nyctocereus Selenicerus* and *Trichocereus* of the cactus family in cultivation.

All are native in the Americas, most have white flowers opening for only a few hours and which are fragrant, although those of the golden heart (*Epiphyllum chrysocardium*) are foul smelling.

At least four species are called queen of the night, including *Epiphyllum oxypetalum*, which has flattened frond-like stems and is probably the most widely grown. It is popular in SouthEast Asia where the Chinese call it keng hwah.

Hylocereus undatus has a three-flanged stem and is often known as the Honolulu queen.

Other nocturnal flowering cacti are called king or princess of the night, Peruvian snowball, lily, moon, torch or night-flowering San Pedro cactus.

The flowering of *Epiphyllum oxypetalum* was studied by the late Professor R.E. Holttum of the Singapore Botanic Gardens and the University of Malaya.

He found that flower buds were continuously produced and each grew until about 3mm long when further development was arrested unless resumed after a stimulus.

All the arrested buds developed simultaneously to open flowers 200 to 300mm long 24 to 25 days after the stimulus. Buds which had not reached the resting state did not respond, although they would do so to a subsequent stimulus after they had grown to the receptive condition.

If there was no stimulus for several weeks, the older buds shrivelled and fell.

The stimulus appears to be cooling, either a day markedly cooler than the previous days or weeks, or a sudden drop in temperature as during a thunderstorm.

The latter usually involves also a rapid rise in humidity and relief of waterstress.

It is sometimes difficult to determine whether this or the cooling is the critical factor but gregarious flowering two or 35 days (according to the species) has been reported in many tropical plants ranging from bulbs, orchids and cacti to shrubs (notably coffee) and trees (eg the Malay angšana).

Such flowers usually do not last long—eight to 60 hours—are often fragrant and striking in appearance, but are not all nocturnal. Many flower by day or last more than 24 hours, seldom more than two days.

— P.R. Wycherley, Nicholson Road, Subiaco WA 6008. ¥

For Sale

Sandalwood Seedlings

approx. 10 cm high, 3 months old,
in small plant bags. \$5 each

Quandong Seedlings

also available

Contact Kevin Smith on
018-917896 (mobile) or
09-339 4752 (a/h)

[Countryman / April 21, 1994]

Chestnut Festival in Manjimup

Visitors will throw more than a few chestnuts on the fire at the Manjimup Chestnut Festival which starts tomorrow.

Council president Don Faulks said Manjimup had become something of a cultural backwater which he hoped to change with an eight-day festival. Support was so strong that the festival was extended to nine days—and the key word was chestnut.

“Manjimup has a thriving chestnut industry and picking starts about Anzac Day every year,” Mr Faulks said. “We thought a chestnut festival would make a change from one involving wine.”

Many Italian families travelled from Perth to pick the nuts—in many cases grown by Italians. The contribution of Italians to the prosperity of the district is recognised in the main festival event, on Sunday.

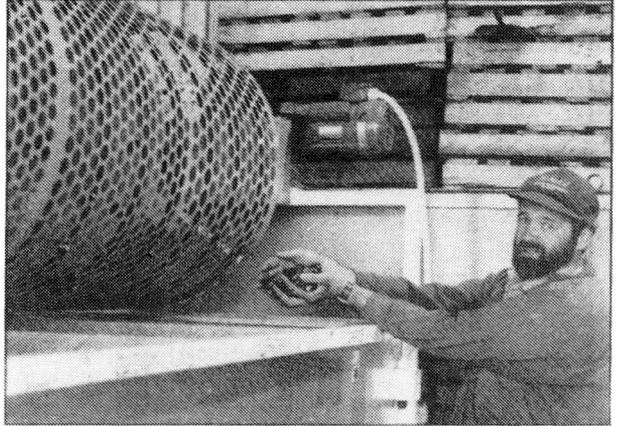
Prominent chestnut grower Tony Fontanini welcomed the festival as an ideal way of promoting a nut which although popular with the European community was still to gain acceptance with other nationalities, Australians in particular.

Mr Fontanini is the State’s biggest grower, producing an annual crop of 15 tonnes at his Manjimup property.

Most of the trees were planted by his father who originally used the property as an apple orchard. “As one apple tree died, dad replaced it with a chestnut tree,” Mr Fontanini said. “He had a bit of foresight and could see

that chestnuts were going to be popular.

“I think the main reason he could see potential in them was the big number of Europeans in WA.”



Tony Fontanini with his mechanical chestnut grader

Chestnuts were ideally suited to the area which had abundant water and good soil. But Mr Fontanini cautioned anyone contemplating joining the industry to think about potential markets. WA now produces 30 to 40 tonnes of chestnuts a year — depending of weather condition —and Mr Fontanini said that was almost saturation point.

He said unless the industry could teach Australians to eat chestnuts, growers would run out of markets. Returns were good now and Mr Fontanini attributed that to his quality product.

He sold 75 per cent from his property and hundreds of people travelled from Perth to pick nuts during the season, which started this week.

— Valma Ozich

[West Australian / April 9 1994]

PAULOWNIA PIONEERS

THE founding vineyard of the Great Southern wine industry will be used to pioneer another industry—a plantation of Chinese paulownia hardwood trees.

Timor sea oil rig workers Ron McGrath and Andrew Marton have bought the 300-hectare Forest Hill property, 18km west of Mt Barker.

Mr McGrath, 43, a marine officer of Perth, and Mr Marton, 37 an electrical technician from Darwin, have set up a nursery as a start to planting 16,000 paulownia trees—a rapid-growing native hardwood of China—over three to four years.

A syndicate of workers from the same oil rig, the Sedco 708, is backing the \$500,000 project.

Mr Marton, who is also involved with a plantation of 900 experimental trees at Chidlow in the Darling Ranges, said paulownia timber was valued for furniture making, the construction

industry and even for making musical instruments. Plantations could also be combined with grazing and cropping. He said paulownia trees grew quickly—to six to seven metres in the first year. They were deciduous and the falling leaves contributed to soil nutrition.

The men came up with the idea of growing the trees independently while looking for an investment that could ultimately be their job.

When Mr McGrath found out about Mr Marton's Chidlow planting from another rig worker, the men decided on a big venture. Mr McGrath's wife, Sally, found Forest Hill while searching for suitable land. "We thought it ideal for our trees," Mr McGrath said. "The vineyard is a bonus."

The first plantings failed because of waterlogging but the vineyard ultimately proved successful, producing trophy winning wines and providing the impetus for a new industry in the region.

Mr McGrath and Mr Marton said they planned to steadily expand the vineyard. And they said they hoped their paulownia plantation would also be the start of another local agricultural industry.

— Michael Zekulich



Ron McGrath and Andrew Marton
with a paulownia tree

New edition of ATCROS close

Compilation has started on a new edition of ATCROS, the Australasian Tree Crops Sourcebook. Publication of the new edition is scheduled for November, 1994.

To be called ATCROS 1994-95, the new edition will follow the successful format of the first edition, published in 1991. About half the book will consist of tables of information about all sorts of nuts, fruits, and other tree crops, both conventional and exotic — names, growing conditions, propagation, fertilization, and much more.

The second half of the book comprises the ATCROS Directory - contact information for grower, trade, and government organizations of relevance for Australasia, suppliers of plants, orchard and propagation gear, educational courses, consultants, books, and journals in the area, plus seed suppliers and useful contact organizations worldwide.

This edition is being sponsored by

ACOTANC Inc, the Australasian Council on Tree and Nut Crops. It is being offered at a massive discount, \$2.50 instead of \$10.00, to organizations participating in ACOTANC.

WANATCA is already a participant, and has budgeted to cover this cost for all its members — all will receive a copy of ATCROS 1994-95 as part of their WANATCA subscription.

All relevant organizations who did not appear in the first ATCROS and who wish to have an entry, without charge, in the new ATCROS should contact the Tree Crops Centre in the near future.

Previously-listed organizations will be contacted with a reminder and check in the next few months.

From the CLM literature

The extracts below are from the promotional literature produced by Creative Land Management.

Neo-Min

Allan Woodvine, Scientific Horticultural Researcher at Bentley College of TAFE has stated that after two years of repeated trials using a combination of Neo-Min and conventional fertilisers that the combination of the two will produce an increase in the growth rate of Eucalyptus by up to 30cm in 12 weeks.

He also found that where Neo-Min was added to the soil, leachate of fertiliser was reduced by 30%. This means that

conventional fertiliser application rates can be reduced by 50% immediately when used in conjunction with Neo-Min. Nodulation on roots of acacias increased by 200%.

PLANT NUTRITION: A BIOLOGICAL APPROACH

The investigation of plant nutrition has always been one of contention. Van Helmont's (1651) experiments were a search for the principle means by which plants grow. The famous Brussels Experiment was an attempt to demonstrate this principle. Placing a five pound willow tree into 200 pounds of oven dried soil and sealing the vessel, Van Helmont added only water. Five years later he "harvested" the tree finding that it was now 164 pounds. The soil had lost 2 ounces of material when re-weighed.

The assumption made is that the water

was the only ingredient that enabled the plant to grow. Van Helmont overlooked two aspects (1) gaseous exchange and (2) the loss of two ounces of soil material. Consideration of the effect of microbes did not occur in this experiment.

The soil organisms collected nitrogen from the air and made it available to the plant. A further observation from the missing two ounces of soil is the 'digestion' of the soil particles into plant available nutrients. Hence the effect of microbial action has a role in the release of soil nutrients. The enhancement of soil fertility with microbes increases the efficiency of conventional and other nutrients (Abbott, L. University of Western Australia 1993. "Future Depends on Soil Biology" *Farming Ahead*, 1 5:41).

Microbial Interactions in Soil and Healthy Plant Growth

(A.M. Smith, Principal Research Scientist, New South Wales, Department of Agriculture, Biological and Chemical Research Institute PMB 10 Rydalmere 2116):

Microbial interactions in soil play a key role in the biological control of plant diseases, the turnover of organic matter and the recycling of essential plant nutrients. An understanding of the mechanisms involved may lead to more efficient methods of growing plants whether they be food crops in agriculture or native and ornamental plants in gardens.

Mobilization of Essential Plant Nutrients

A major limitation to plant growth in most agricultural soils is an inadequate supply of essential plant nutrients. This occurs even though there are adequate reserves of these nutrients in soil, but they are held in highly insoluble forms. Their high degree of insolubility prevents loss from the soil by

leaching, but since they are only available to the plant in the soluble form, problems of supply rate to plants are created. Formation of anaerobic microsites in the rhizosphere of plants which is of such paramount importance to ethylene production, can play a critical role in the mobilization and thus supply rate of these essential nutrients to plants.

Some practical guidelines for successful management of soils include:-

(1) It is essential that organic residues be returned continually to the soil. Organic residues contain essential plant nutrients for recycling, stimulate microbial activity in soil, supply ethylene precursor and restrict the rate of nitrification in soil. It is best to use mature plants as a source of organic amendments and it is better to return the residues to the soil surface rather than incorporate them into the soil.

(2) Techniques of minimum tillage should be utilized wherever practical. This ensures that plants are growing in soil virtually continually that there is a minimum of disturbance to the soil and increases the amount of organic matter that is returned to the soil. Again, nitrification is restricted when these techniques are used.

There is an alarming decline in the amount of soil organic matter deficiencies of plant nutrients become commonplace and the incidence of plant diseases increases dramatically.

We attempt to overcome these problems by additions of inorganic fertilizers and by the use of pesticides which increases our production costs considerably. It is also generally true that the longer we farm soil, more and more of these inputs are necessary to maintain our yields.

[Countryman / March 31, 1994]

\$2m program will identify new crops

THE University of Queensland Gatton College will lead a \$2.25 million research program over the next five years to identify new, commercially-viable crops.

The project — funded by the Rural Industries Research and Development Corporation and the Grains Research and Development Corporation — will also involve the CSIRO, Queensland Department of Primary Industries and New South Wales Agriculture Department.

Dr Rob Fletcher, a plant breeder at Gatton's plant production department, said the program would benefit the agricultural and food industries as well as Australian farmers.

He had compiled a list of 4236 potential new crops—including beverages, cereals, drug plants, medicinal and pesticide crops—as the first step in the program.

Dr Fletcher said the research team had come up with an innovative market-driven approach to evaluate and select those crops with the best economic prospects and to help foster their commercial development.

— John Logan

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[Kansas Nut Grower News / December 1993]

Kernels of Wisdom

New York City Physician, Dr. R.T. Morris, was among the founding members of the Northern Nut Growers Association. In 1922, Dr. Morris spoke these words to his nut growing friends at the annual meeting of the NNGA.

"I have had a good many experiences in grafting for a number of years. I have finally discarded most methods and have gotten down to rather simple principles. As a matter of fact this is the last word from my own point of view. During the past thirty or forty years I have changed my mind so many times on so many subjects that I have no confidence at all in anybody who puts any trust in me."

Later in his presentation Dr. Morris spoke of the importance of a sharp knife.

"... it is well to have a knife with which you can shave. That is the sort of edge to use in all our grafting work, the sort of edge that will bring terror to the heart of the mother of boys. I find very few people who can sharpen a knife. They put on a feather edge, or they leave a round edge, or at any rate they are unable apparently to use a little finesse required to put the finishing touch on a really good knife."

KNGN Editor's Note: Simple methods and a sharp knife - words I can use when I start dreaming up exotic new methods for grafting.

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Research plant collectors sought

We have been contacted by David Sleigh of B & T World Seeds, who have a very comprehensive catalogue of seeds, but are looking for collectors.

He says "We wish to identify Australian suppliers of tree and shrub seeds, common and rare, also collectors and suppliers of plant material (fruit, leaves, bark) for use in medicinal and biochemical research."

Anyone able to help can contact David at B & T Seeds, Fiddington, Bridgewater, Somerset TA5 1JE, UK — phone & fax, (0278 - 733209

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JUJUBE: Ian Fox, 310 8972/H, 015-38 4820/mob (PO Box 217, Willetton 6155)

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CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: July 20

1994

May 18 Wed *General Meeting (Frank Ellis - *Improving Soil Productivity for Tree Crops*)

Jul 5 Tue Executive Committee Meeting

Aug 17 Wed *General Meeting (Ed Barrett-Lennard - *Growing Perennial Plant Crops under Saline Conditions*)

Aug 20-22 Aust. Nut Industry Council Annual Conference, Riverland

Aug 24-25 WANATCA at Agricultural Show, Dowerin

Oct 1-8 WANATCA at Royal Show, Claremont

Oct 18 Tue Executive Committee Meeting

Nov ?? Sun § WANATCA 'Bring & Buy' Meeting?

Nov 16 Wed *Annual General Meeting

1995

Sep §ACOTANC-95, Lismore, New South Wales

*General Meetings are held starting at 7.30pm. Venue: Greening WA, 1118 Hay Street, West Perth.

These meetings usually include a current magazine display.

§ For contact details refer to the Tree Crops Centre.

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