

# Quandong

magazine of the

West Australian Nut & Tree Crop Association (Inc)

**Second Quarter 1991**

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**The CHINESE CHESTNUT (*Castanea mollissima*)**

## Next Meeting:

### GENETIC ENGINEERING AND TREE CROPS

An exciting topic for our next meeting — all about how genetic engineering is being applied to plants, and some current and possible future applications in crop trees.

Our speaker will be **Stewart Washer**. The fascinating Avowest avocado orchard in Wanneroo, which we visited during our last Field Day on March 17, belongs to the Washer family. Stewart is the son of Nola and Mal Washer, who created this huge orcharding enterprise from scratch over the last 10-12 years.

Stewart has a science degree from the University of Western Australia, and is now working on Plant Molecular Biology in the Biotechnology unit at Murdoch University. He is familiar with the great advances being made in this area, using the powerful tools available to genetic engineering.

An example is the incorporation of a gene from the bacterium *Bacillus thuringiensis*, used in a natural organic method to control caterpillars, directly into the genetic structure of cotton plants, thus causing them to produce their own insecticides. Other applications involve exploiting the Moreton Bay Chestnut, *Castanospermum*, to produce a possible treatment for AIDS, using engineered bacteria to treat metals, and producing specialist drugs such as insulin in 'gene factories'.

As usual the meeting is free and open to the public — visitors welcome.

**Time: Wednesday May 15, 7.30 pm**

**Place: Naturalists Hall, 63 Meriwa Street, Nedlands**

## *Another interesting Field Day - May 19!*

Following the great success of our March 17 Field Day in the area north of Perth — attended and thoroughly enjoyed by around 80 people — we have another event scheduled for Sunday May 19, in this case to some properties south of Perth. Members should receive a pull-out-and-pin-up leaflet about the Field Day together with this issue of *Quandong*.

The Field Day again includes three properties. We meet at the Dept. of Agriculture's Medina Agricultural Research on Abercrombie Road, Medina, at 10.45 for an 11.00am start. We later travel on to Baldivis Estate and Peel Tropical Fruits, further south, to see a range of less usual tree crops.

Looking forward to seeing you there!

## ALL ABOUT WANATCA . . (A POTTED HISTORY)

It would not be inaccurate to say that WANATCA had its beginnings over lunch. I was eating with a colleague from the University of Western Australia, back around 1967, and he said to me “You know, I reckon nuts would be a good thing to look into”.

He went on to say that he had a few nut trees in his yard, but had found out he was allergic to nuts! Whatever, I did “look into nuts”, and they turned out to be a fascinating area. People got to hear that I was interested in the topic. Somebody gave me one of the huge cones of the bunya pine, from a local park tree, and I really enjoyed the big tasty nuts of this Australian native.

Soon most of the space in the tiny backyard I had then was filled with pots of usual and unusual nuts. I rented a bit of space behind the Perth Toc H office, at a very concessionary rent of \$1 per week, and soon filled that up too.

In those days many of the nuts we now take for granted, like pecans and pistachios, were virtually unknown in WA. No local nursery had anything other than almonds on sale, with perhaps a few hazels brought in from the Eastern States each winter. Chestnuts existed here, and a few nuts found their way to market, but you couldn't buy trees.

In 1969 I managed to buy a 13-acre bush block near Dwellingup, in the hills southeast of Perth, for \$2500. I started to raise plants to put on this block, and began to sell some trees to others who contacted me. I was the only producer in the state of some of these trees, on my 25 square metre nursery!

In 1974, one of my buyers suggested that

there was a need for a local group to take in people interested in growing nuts. I contacted the editor of the WA Gardener, the magazine produced for the societies of the WA Horticultural Council, and we put in a notice inviting anyone interested to contact me.

At the end of 1974 we had 16 members, a Secretary (Carolyn Blackwell), and a name, the West Australian Nutgrowing Society. I was the Publications Editor, Peter Good became President. We put together a Constitution, based on those of the California Macadamia Society and the California Rare Fruit Growers. Our subscription rate was \$5/year.

Early in 1975 we put out the first issue of our magazine Quandong, named after the only WA native nut we knew about then. This was a quarterly (sometimes we only managed 3 issues!). In the early years, membership grew rapidly — we seemed to be filling some community need.

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In 1976 we put out the first, 1975, edition of the WANS Yearbook, a more substantial publication with longer reference articles. This publishing pattern was copied from the California Rare Fruit Growers, whose driving force was Paul Thomson. Of course, WANS had little funds, and many financial short-cuts were taken — I printed the first Yearbook myself, getting the use of an offset press after working hours.

Around 1977 some of the members of WANS put together a cooperative company, West Australian Nut Supplies Co-operative Ltd. We got some cheap accommodation and opened a specialist nut shop, Squirrel Nutkin, on Wednesdays and Saturday mornings. We also ran WANS from the same premises.

Squirrel Nutkin was a lot of work, but also a lot of fun. We tried to get, for sale, as many unusual nuts and nut products as we could. We had pili nuts from the Philippines, ginkgo nuts from China, walnut oil, hazelnut paste, and we virtually opened up the WA market to such things as pecan and pistachio nuts. CSR put up a good professional campaign on macadamia nuts, until then quite unfamiliar to the WA public, at this time too.

Squirrel Nutkin also sold nut trees, raised mostly by WANS members, and also sold books about nuts. Its early mainstays were Edmund Czechowski, on the financial side, and later Tony and Bethia Bryant — Bethia took over from Caroline Blackwell in Squirrel Nutkin days and also produced *Quandong*. Brigitta Jones did a great job on running the shop activities.

At the end of 1979 the cheap accommodation evaporated, and Squirrel Nutkin in its original sense had to be dismantled. The name Squirrel Nutkin was sold to one of our members, who used it for a

youth-assistance style nut and craft shop, with unemployed youngsters selling packaged nuts round offices.

The Society went through a fairly slow time at the beginning of the 1980's. In 1980 I was on a trip to New Zealand, and visited Douglas Davies, Secretary of the New Zealand Tree Crops Association. Doug was then working with the DSIR Crops Research Division in Christchurch.

The New Zealanders, although initially mostly interested in nuts and newer fruits, had intentionally set their sights wider with the name 'tree crops'. In 1981 the WANS executive decided it was time to expand our own field of interests, and the new name West Australian Nut And Tree Crop Association was adopted.

In 1979 I had attended a conference of the Northern Nut Growers Association in the US, and had been impressed with the value of such conferences. Doug Davies called on me in Perth in 1981, and together we put together the idea of a tree croppers' conference for the whole of Australasia — the ACOTANC series. ACOTANC is the acronym for Australasian Conference on Tree and Nut Crops.

With the help of Tony Allen of the Victorian Nut Growers Association, Doug and I put together the basis for ACOTANC-1, and this was held in Perth in May 1982.

ACOTANC-1 was a great success, with numbers attending much greater than initially hoped for. With the theme 'Tree Crops, the 3rd Component' (of agricultural land use, together with stock raising and field crops), it seemed to strike a strong public chord. Arrangements were made to have ACOTANC sessions every two years; ACOTANC-84 in Victoria, and ACOTANC-

86 in New Zealand, were laid out in 1982.

Progress since 1982 has been steady. In 1984, WANATCA became a legally incorporated body. Since 1980, I have noticed an increasing professionalism and maturity in the activities of WANATCA and its members.

In fact I think it would be fair to say that the 1980's were a decade of coming-of-age for us. Many of our members who started the decade more or less as amateurs or beginners have now matured to producers and professionals. Several members have involvement in commercial nurseries specializing in a range of tree crops. In 1980 such nurseries were virtually non-existent. Other members have become significant producers of nuts or exotic fruits. Others now offer specialized services such as consultancy.

Another development has been the broadening of our interests. Concern with ecology and rational land use has been a feature since the early years, and has led to involvement with areas such as sustainable agriculture and tree crops on broad-acre farms. Interest in 'non-standard' tree crops, things like native Australian tree foods, plant biochemicals, and beverage crops, covers areas which probably contain the 'sunrise' horticultural industries of the future.

The most recent development, and perhaps one which will set the tone for the 1990's, is the establishment of the Tree Crops Centre in a permanent central location. The Tree Crops Centre acts as the headquarters of WANATCA, and is an access point to many information and commercial services in the tree crops area.

It also houses the ACOTANC Permanent Secretariat, which maintains liaison and continuity between conferences. The TCC's

'regional' emphasis will be further enhanced with the forthcoming production of the first edition of the *Australasian Tree Crops Sourcebook*. Like ACOTANC, the new ATCROS is intended to be a valuable ongoing facility for people throughout our part of the world.

WANATCA now embraces possibly a wider range of interests and contacts than any other comparable organization elsewhere in the world. Members outside WA and overseas are always sought, as these members bring new experience and benefits to the more local members. The decision was made early on keep the running of WANATCA within WA, and not attempt to 'go national'.

At the same time, the aim has been to service members drawn from anywhere in the world, and to cooperate as fully as possible with other organizations. Western Australia still has a relatively small population to draw on, so we have needed to look outside beyond our own borders to remain viable!

— David Noël

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[Agricultural Research, October 1988]

## FRUIT FLIES CAN'T TAKE THE HOT AIR

A new hot air process for zapping fruit flies may give growers in Hawaii and other tropical climates new and profitable opportunities to sell exotic tropical fruits and vegetables to new markets.

The technique — gentle on produce but tough on fruit flies — might be suitable not only for papaya but also for mango, atemoya, carambola, lychee, longan, rambutan, and other tropical specialty crops, says ARS research entomologist John W Armstrong.

USDA's Animal and Plant Health Inspection Service has accepted the process as a federally approved quarantine treatment for papaya exported from Hawaii, and is now awaiting public review of the technique.

Quarantine treatments are an extra precaution to ensure that Hawaiian grown papaya are free of the three species of fruit flies (Mediterranean, oriental, and melon flies) that could attack it. These pests pose a continuing threat to mainland crops. But most commercially grown papaya from Hawaii is so carefully checked that it is highly unlikely a fly-damaged papaya would make it to a mainland supermarket, according to Armstrong.

Female fruit flies ruin papaya by puncturing the fruit to lay eggs just beneath the surface. The wound may also cause staining. The worms that develop from the eggs hasten rot and make the crop worthless.

Hawaiian growers sold US\$11 million of fresh or processed papaya to Japanese, Canadian, and mainland US markets in 1987.

Here is how the new process is expected to work in packinghouses: hot air, kept at about 50 percent relative humidity (that's midway between moist and dry) is forced over the surface of papayas packed in single layers in ventilated plastic crates. The fruit is gradually heated to 117°F over a 7-hour period, then cooled with water.

Armstrong and colleagues James D Hansen of ARS and Benjamin K S Hu of the inspection service adapted the process from a moist-air, or saturated-vapour, approach. But the new hot air technique is better than that and other methods in killing flies without harming the taste or texture of fruit in the shipment, Armstrong says.

That is because the saturated-vapour heat treatment with hot, moist air and the other approved treatment — a two stages hot-water bath — kill fruit fly eggs and maggots but occasionally cause scalding or hard, permanent lumps to form in the fruit.

(John W Armstrong and James D Hansen are with the USDA-ARS Tropical Fruit and Vegetables Research Laboratory, P O Box 4459, Hilo, Hawaii 96720.)

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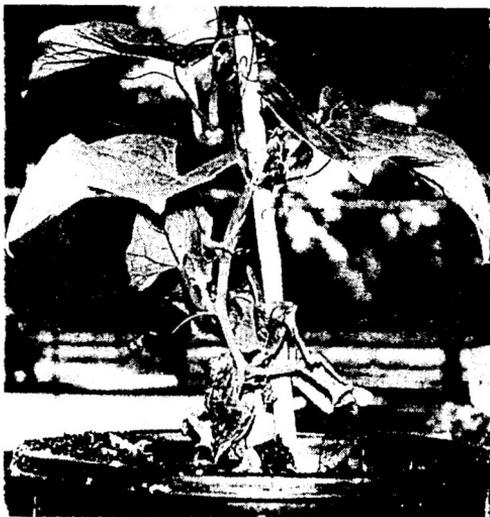
*Phone (066) 89 5192*

[West Australian/ October 26 1990]

## GROW CHOKOS AT HOME

The choko (*Sechium edule*) is a perennial member of the cucurbit (gourd) family and originated in the West Indies and Central America.

While the choko is readily available in fruit and vegetable stores, it is not always realised that the vine can be grown quite



easily in the home garden. Susceptible to frost, it requires warmth for growth as well as fertile soil and regular watering.

To cultivate a choko, select a mature fruit that is free of prickles and keep it in a cool, airy place till a shoot appears. Then it can be planted near a trellis or fence over which it can climb. Cover the choko with soil to the depth of its size, taking care not to damage the shoot. This should protrude from the soil.

Once it starts to grow, the vine produces climbing tendrils which take hold of the support. If you need to improve the soil

content do so before planting. Dig in a generous amount of compost and peat and a dressing of pre-planting fertiliser.

After planting, place a mulch of cool farm manure over the soil, keeping it slightly away from the choko. This plant benefits from regular feeding every three or four weeks with a complete fertiliser applied to moistened soil and watered in thoroughly.

Plants started in spring will bloom in late summer and bear their fruit in autumn. Once the choko stops producing, the vine should be cut back to ground level. New shoots develop each spring. When properly cared for, the vine will remain productive for several years.

The fruit should be picked regularly when five to seven centimetres long and of a lime-green colour. Do not allow the fruit to mature on the vine. Chokos can be stored in the fridge for about a week, but they are not suitable for freezing.

There are several ways they can be used - in casseroles, salads, pickles and chutney. The pear-shaped fruits have a flavour and texture similar to squash and marrow.

They are also tasty when sliced, dipped in egg and breadcrumbs, lightly fried and served with a sprinkling of oregano.

— Joan Hillary

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[CSFRI Information Bulletin (South Africa)/ July 1990]

## GUAVA FRUIT QUALITY INFLUENCED BY TIME OF PRUNING

Pruning of guava trees is an important cultural practice. In the past recommendations as to the time of pruning have been based mainly on the desired harvest time and yields.

However, pruning time also influences the quality of the fruit produced. **Fruit from August, September and December pruned trees have a poorer quality than fruit from the trees pruned in October and November.**

Fruit from August, September and December pruned trees are smaller and have a thinner fruit flesh than fruit from trees pruned in October and November (Fig 1 a, b, c). The total soluble solids (TSS) are higher in October and November pruned trees than in fruit from trees pruned at other times. September pruning results in the lowest TSS value (Fig 2a). TSS is dependent on external factors and the variation observed with pruning time is thus due to prevailing climatic conditions. If the trees receive excessive amounts of water (rain or irrigation) and overcast weather is prevalent during the last period of rapid fruit growth, fruit will have a low TSS value. However, all the Fan Retief trees (CHECK!!) at CSFRI, Nelspruit, showed an inherent ability to produce fruit with a TSS in excess of 120 Brix. The minimum is thus probably cultivar dependent.

Total titratable acids (TTA) are highest in the later pruning times (Fig 2b). TTA is important

in influencing the sugar acid ratio which in turn affects the flavour of the fruit. Ony fruit from December pruning appears to have a very low ratio (Fig 2c).

Ascorbic acid content of the fruit also varies with pruning time, with November having the lowest value and September the highest (Fig 2d). It is unclear what influences these variations, but it is possible that the length of time that the fruit hangs on the tree and, in particular, the length of the last rapid growth period as well as climate could be

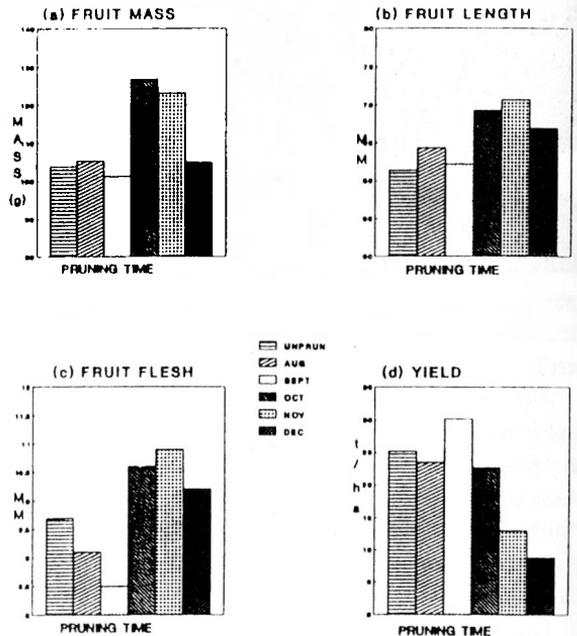


Fig 1. Physical characteristics of guava fruit and yield as influenced by pruning time

important.

Yield is also influenced by pruning time. **September pruning results in the highest yields, while December and November have very poor yields** (Fig 1d).

When selecting pruning time one must decide on what the desired end product must be. If a high yield is the only criterion then September is the best pruning time at Nelspruit.

However, if fruit with a good quality is desired October or November pruning gives better results. October pruned trees, however, have a much higher yield than November trees and this would appear to be the best pruning time for Nelspruit.

— Rosemary du Preez

### MAKING MACADAMIAS START FRUITING

One of the commonest questions asked by people who have planted seedling macadamias is, "When will they start fruiting?".

Sometimes they are disappointingly slow. A friend with a tree in Shenton Park, Ed Kopsen, asked me this question about a year ago, and asked if there was anything he could do to hurry it up.

The tree was definitely big enough to fruit (about 2.5 m high). All I could think of to suggest was advice passed on to me by Tim Lynn-Robinson: trim back the ends of the branches to make multiple shoots appear.

Ed reports that it has worked! For the first time his tree is now fruiting.

— David Noël

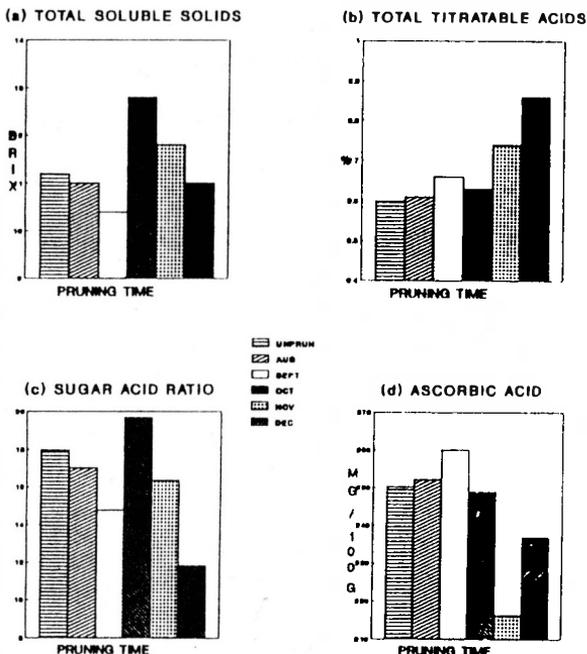


Fig 2. Chemical characteristics of guava fruit as influenced by pruning time

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## BLACK TRUFFLES IN NEW ZEALAND

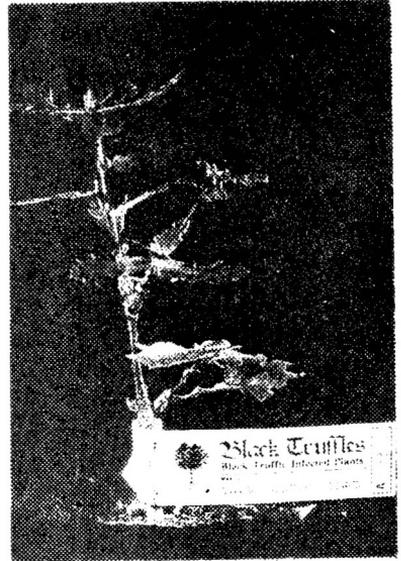
New Zealand black truffles could well be gracing European tables within a few years if progress on the country's truffle plantations (truffieres) continues on track.

Truffles grow underground on the roots of established trees, taking anything from three to ten years to form. Although prized for its unique flavour and intoxicating smell, the spherical black fungus gives no visible appearance of its value, being described as a 'cross between a shrivelled human brain and a lump of coal'.

The natural habitats of the black truffle are the oak forests of Southern France, Northern Italy and Spain and traditionally peasants searched for them with the aid of a specially trained pig or dog. In the mid-1800s a hit and miss system for raising plants infected with the black truffle was to plant acorns under trees where truffles had been found. However, it was not until the late 1970s that techniques were developed in France and Italy for the controlled cultivation of the delicacy which began by raising infected seedlings of the host plants. This research has since been duplicated at Invermay.

Mycologist Dr Ian Hall, Invermay's truffle expert, has spent several years researching the production of this famous delicacy, but his method of infecting hazel and oak tree seedlings with the fungus, which takes up to two years, remains commercially sensitive.

Four thousand trees infected with the black truffle fungus have already been planted in several areas around the country, as research into this potentially big money earner is carried out in MAF Technology laboratories at Invermay.



*Container grown black truffle infected plants*

The first commercial New Zealand truffiere was planted in October 1987 and is expected to produce sometime between 1991 and 1997.

Black truffles prefer a lime rich soil, and some areas of New Zealand have ideal soil and climates, similar to those in Italy, France and Spain. North Otago, North Canterbury, Poverty Bay and Hawkes Bay have proved ideal sites, while a programme of soil modification has been undertaken in Picton, Tasman, Paraparaumu, Taumaranui and the Bay of Plenty. Although these truffieres are privately owned, MAF scientists involved in the project keep a close eye on each one. The roots of several trees checked recently show

the fungus is still there and has moved a metre or so out from the plant, and they are encouraging symptoms of truffle growth at a few of the truffieres. Wet areas like the West Coast, and cooler places like Southlands, are not being considered as potential sites.

While he has looked to France and Italy to learn about cultivating truffles, Dr Hall has also adopted technology not used in European countries. The New Zealand truffieres have irrigation to ensure drought does not mean disaster, as is often the case in France, and Dr Hall has selected sites which are free from competing fungi to minimise the risks as much as possible.

A dry summer in Europe last year proved catastrophic, with only ten tonnes produced in France, compared to 1000 tonnes coming out of the ground at the turn of the century.

While harvest dates are unknown at the stage, MAF is preparing itself already, by training a dog for the job. The Italians have used dogs for many years to sniff out and dig down to where the truffles are buried. Staff at the New Zealand police dog training school have trained a labrador to do the same.

Finding markets for the 'black gold' is not considered an obstacle.. The Perigord black truffle has long been considered a great delicacy, and chefs throughout the world prize the valuable fungus for cordon bleu cooking. Chefs in New Zealand too, have indicated they're keen to get their hands on fresh truffles, but it is the exprot industry rather than the local tourist trade, that these ventures are aiming for.

No one knows for sure whether New Zealand is capable of producing truffles, so investment in Perigord black truffle growing must be seen as a speculative and potentially high-risk investment.



*Signore G. Falconi's black truffle truffiere in Marche, Central Italy*

Dr Hall's research into truffles led him to co-write a book with Gordon Brown, aptly named 'The Black Truffle', released last year.

This comprehensive guide had promoted even wider interest in the commercial growing of truffles, and it is recommended that prospective clients read the book before taking the idea further. The book retails at \$37.50 with copies available from Invermay.

Another five thousand plants will be produced again this year, as interest in the project continues to accelerate, and more truffieres are expected to mushroom up around the country.

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*(The Black Truffle, by Ian R Hall and Gordon Brown, is available from Granny Smith's Bookshop at \$44.95)*

[Australian/ June 9-10 1990]

## Wattle it be? Bunya nuts or lilly pilly?

Witchetty grubs might appear on the odd restaurant menu, but so far bush tucker has hardly made great inroads into the national diet. How many people have ever tasted wattle seed ice-cream? Lilly pilly jelly? Even quandong jam?

Despite Les Hiddens's excellent and hugely popular television series *Bush Tucker Man*, now being repeated on the ABC, not too many bush foods seem to have made the transition from scrub to shop.

Nevertheless, the series served to increase our awareness of how rich Australia is in native foods. It certainly captured public imagination - videos of the series have become one of ABC Marketing's most successful releases, and a second series, to be screened next February, is in the making at the moment.

Though there has been an increased interest in native foodstuffs in the two years since the series first went to air, none is yet being farmed on a commercial scale. The native with the most obvious potential is the billygoat plum, *Terminalia ferdinandiana*.

"Ounce for ounce, they have 50 times the Vitamin C of an orange," Hiddens points out.

"All the fruit juice you people in the cities drink actually has ascorbic acid added to it. Here you have a natural source of it that is viable from a medicinal point of view as a commercial crop."

At the moment in the Northern Territory, there is a plan to grow the billygoat plum commercially on Melville Island. The project, designed by Brian Woods with assistance from the Northern Territory Government, is awaiting substantial finance — from Germany.

In Western Australia, Hiddens showed us dogs' nuts, an Aboriginal remedy for colds, which tasted, he said, like apple strudel. "There were some early pioneers who used them in lieu of aspirin," he says. "The pharmaceutical industry could do well to have a close look at them. It wouldn't do any harm."

While both of these natives have potential medicinal applications, foodstuffs are lagging behind. Among Hiddens's delights was another of the *Terminalia* genus, from the Kimberleys. Hiddens calls these Kalumburu Almonds: "If you could make the fibre on the outside smaller and the nut on the inside bigger with genetic engineering, it would probably be worthwhile. Then they might be commercially viable."

We have been guilty in the past of overlooking the commercial potential of certain Australian natives. We let the Hawaiians take the initiative to farm and

popularise the macadamia, the only Australian native farmed so far on a commercial scale.

With the rapid decline of the North American maple, there have been calls recently for the commercial potential of the sap of the Tasmanian cider gum to be investigated as an alternative to maple syrup.

But one of the drawbacks Hiddens's series demonstrated was how difficult these products are to gather. They are most often found in inaccessible places, and then not in any great quantity. Consistency of supply has to be ensured for them to become more than a cottage industry.

Until now, native foodstuffs haven't appeared as lines of packaged food; at the moment they are available only at specialist outlets. This is changing, and bush foods have begun to creep into the mainstream.

The widely distributed South Australian company Beerenberg is making a quandong jam from the native wild peach, and two Melbourne hotels are testing the commercial potential of native foods. The Eden On The Yarra has just started doing a buffet-style Sunday brunch featuring such bush foods as buffalo with lilly pilly sauce, baked fish with lemon aspen chutney, and desserts including a bunya nut and wattle seed roulade.

Next month the Hyatt will be featuring a bush food menu. Among other bush foods, it will be offering witchetty grubs and emu, the latter farmed by an Aboriginal community in Western Australia.

Also in Melbourne, restaurateur



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Jacques Reymond has introduced wild limes preserved in wild honey and brandy with pheasant to his menu. When a restaurateur of his calibre begins incorporating bush flavours, they're well on their way to wider acceptance.

In Sydney, Jean-Paul Bruneteau at his restaurant, Rowntrees, at Hornsby, has had witchetty grubs on a menu featuring many other bush foods for some years. He now makes and markets cans of witchetty and bunya nut soup.

John Cooper's Foodshow, an upmarket deli in Paddington, pioneered a commercial range of bush food three years ago. Now marketed under the name Kurri Kurri, its products include jams, jellies and relishes such as billygoat plum, lilly pilly jelly and wild rosella relish. It believes the Sydney market is still warming up to bush food.

Rosella relish is always popular, and the wattle seed icecream has been a consistent seller; it's been described as a bit like coffee icecream with the coffee grounds left in, but it is delicious. The delicatessen's corporate catering also includes bush foods such as scorched Illawarra plum glaze on its menus. But there have been problems with the consistency of supply, and the pilots' dispute didn't help.

## **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

Also based in Sydney is Vic Cherikoff's company, Bush Tucker Supplies. Last year he published a book co-written with Jennifer Isaacs, *The Bush Food Handbook*, to give people an idea of how to go about their own foraging.

"It's a real hands-on exercise, to become more familiar with the Australian bush, so that you can go walking through city streets and find out what edible plants the councils are growing, or what's in your local bushland," he says.

"We've also included a chapter on gardening with wild food plants."

Cherikoff is also partner in The Wattle Seed Deli on the edge of Sydney's Chinatown, which specialises in such foods. Among its products are bush tomatoes. About the same size as large raisins, they taste rather bitter but might work well in a curry.

Wattle seeds are available in packets for use as a beverage, or as a flavouring for baking breads or biscuits. The Wattle Seed Deli also has native pepper leaves, used in the same way as bay leaves, and stocks the products of Glen Robins, a Melbourne company that works in close association with Cherikoff.

"We use a lot of the food he gathers," says Julie Robins who, together with Glenda Warn, makes the Glen Robins range of native products sold through Robins' Food Store in Toorak. These include rosella jam, clove lilly pilly, bush tomato, rosella and lilly pilly chutneys, and a range of jellies including Kakadu plum.

The Glen Robins range also offers butter flavoured with lemon aspen, extracted from a tropical rainforest tree, and a lemon aspen vinaigrette. The products have been available for 18 months, albeit in smallish quantities,

according to Robins.

“Everything has to be hand-gathered. Eventually we’d like to get our products into places such as David Jones’ Food Hall.

“In the shop we do a lot of gourmet food to take away — last week we did wild duck with Illawarra plum sauce. There’s a growing awareness, and there’s a huge amount of interest from tourists.”

With tourists on the lookout for anything novel and uniquely Australian, there ought to be great market potential in that area.

In Adelaide, Andre Fielke supplies about half a dozen South Australian hotels or restaurants with bush tucker.

“I organise collectors to go out, and I wholesale to restaurants in Adelaide such as the Hyatt,” Fielke says. “Bunya nuts, quandongs, clove lilly pilly, warrigal greens (like a spinach), ground wattle seeds. The interest is growing dramatically. I have had a huge increase in my sales.”

Fielke is planning to open a bush tucker cafe in Adelaide by the end of the year.

“People are starting to realise we have these unique Australian foods — it’s something a little bit different to offer tourists,” he says.

“We have so many unique fruits, flavours and textures. The bush food industry is really poised to take off.

“I was in the United States and Canada in February, and they all wanted to know where they could order the stuff. They were just knocked out by the flavours. It’s going to be huge. That’s why we’re trying to encourage people to farm them.”

Les Hiddens is probably right when he says it won’t happen on a large scale until there is deemed to be some financial advantage. But somehow I don’t think Hiddens will be popping in to any of the city restaurants to grab a bite of witchetty grub. What Hiddens thinks of putting them on a menu is akin to onanism.

— *Cherry Ripe*

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[The Australian, Oct 27 1990]

## THERE'S MORE THAN A LITTLE OLE IN EVERY KIND OF OLIVE OIL

If it happened in the wine industry — and it has — it would be a scandal of major proportions: importing a product from one country to another, blending it, re-labelling it, and selling it as the product of that second country. But it's apparently just what happens to much Spanish olive oil.

According to Anne Dolamore in *The Essential Olive Oil Companion*: "Italian law allows olive oils imported from other countries to be re-exported without stating the source. So in some cases you may be buying a bottle which has 'produce of Italy' on the label, but the oil could well have come from Spain."

This sort of thing goes on in all sorts of areas of food. One example: Australia exports block cheddar to France and the European Community, where it gets mixed up with French gruyere, butter and emulsifier, and re-exported to us as French processed cheese wedges — generally with a smiling cow on the front, no doubt hugely enjoying the joke.

EC legislation does allow a certain percentage of oil from elsewhere to go into "Italian" olive oil, while still allowing it to be called Italian. And the figures are incontrovertible —

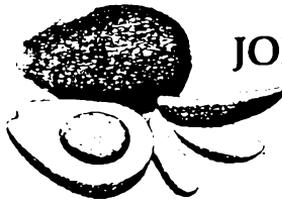
Italy consumes more oil than it produces, and still has plenty left over for export, so the extra must come from somewhere. (In 1986-87, for instance, it consumed nearly twice as much as it produced, and still exported the equivalent of just under 20 per cent of its own

production.)

To be sure you are getting olive oil actually originating from the country stated on the label, you can safely buy Spanish olive oil. This is writ large on the bottle or tin.

Spain was the first country in Europe to establish a Denomination of Origin for olive oil. It is the largest producer in the world, accounting for 30 per cent of world production. Everywhere throughout the Iberian peninsula, olive oil is a primary ingredient, whether covering a spring dish of boiled artichoke hearts in the north, or in the south in Andalusia where all the frying is done in it, or even in baking, in both sweet and savoury doughs. Wherever you are in Spain, it is the one constant, universal component of a meal.

As might be expected, the olive too is ubiquitous. Bars frequently buy their own olives direct from the grower, and cure them



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themselves, sometimes with herbs such as rosemary or thyme, lemon, garlic or fennel seeds.

Olives have been grown in Spain for almost 3000 years: the Phoenicians are said to have introduced them to the city of Cordoba around 1000BC, and the city's name meant "oil mill" in Phoenician.



Spain was exporting olive oil to Italy even in Roman times. Last century, an archaeologist excavating a wall on the banks of the Tiber discovered that the entire wall was built of broken amphorae—40 million of them—most of which had come from Spain. Each of these would have contained 50 litres. That's some quantity.

There are now some 200 million olive trees in Spain, mainly in the east and south-west, and there are around 40 varieties of olives commonly grown. Manzanilla, perhaps the variety most familiar to us, is grown as a table olive because of its lower oil content; others with a higher oil content, such as picual, picudo, gordal and morisca, are grown for oil production.

Each of these varieties brings its own flavour characteristics to the oil, as grapes do to wine, and the flavour is affected by the soil in which it is grown.

In the Spanish oil trade, there is a codified vocabulary of 30 words used to describe various flavour characteristics of olive oil. These closely resemble adjectives used to describe wine—fruity, grassy or having apple or almond characters. Grubby or cucumber flavours are considered faults.

Six main brands of Spanish olive oil are imported by Australia. In a follow-up to the recent national television advertising campaign, Spanish food writer and flavour professional Alicia Rios has been brought out to reinforce the Spanish olive oil message.

As the co-author of a book on olive oil, unfortunately not yet available in English, she sees the

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advantages of Spanish olive oil over that from other countries as being its long history of production and the many different climates and soil types that produce it.

“We have such an extended production over many different geographical areas, so we can obtain many different nuances with respect to aroma, flavour, texture and colour,” Rios says. “In other countries like France or Italy, the geography and climate is more restricted, and doesn’t allow them to produce such a variety of olive oils.

“We can obtain the best mono-varietal oils — that is, oil made from just the one variety of olive: arbequina from Catalonia, for example, is a very singular and very specific olive oil.”

There is also much regional rivalry, such as between the oils of Catalonia, Alicante and Andalusia all, vying to make the best. Rios is an expert not only on oil’s culinary uses but also its cosmetic and medicinal uses from ancient times to the present: as a skin moisturiser, a facial cleanser, or a hot pack to condition the hair, an aid to digestion, and as a laxative.

When visiting England, for instance, Rios’s co-author on the book, Lourdes March, travels with her own personal supply. “We really need it to complete our digestive functions,” Rios says.

I am reminded of an anecdote about a famous operatic diva from Italy or Spain who was invited to appear at Covent Garden. After three days of gruelling rehearsals, this grand dame, who had next to no English, retired to her hotel room and locked herself in, refusing to come out or speak to anyone.

Eventually, in desperation, with the dress rehearsal imminent, a prominent native of her country was summoned to find out what the problem was. The answer he relayed to the astonished opera house management was along the lines of “How do the English ever go to the lavatory? They don’t eat olive oil!”

A bottle of olive oil was quickly procured and — problem solved — the dress rehearsal went on as scheduled.

— *Cherry Ripe*

*The Spanish Olive Oil Advisory Service will provide nutritional information, as well as recipes, on (008) 025 701.*

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## NEW GIANT GRAPE VARIETY APPEARS IN PERTH SHOPS

Bill Napier has been very impressed with a new giant grape variety, ‘Redglobe’, which has begun to make an appearance in Perth shops.

According to information obtained by Bill, the variety is protected by a United States patent — so it presumably was bred there.

‘Redglobe’ is a red, seeded, midseason table grape variety. Its performance in Western Australia has been monitored for

three seasons, and export standards have been developed for the variety.

According to Ian Cameron, of the WA Department of Agriculture, the variety appears to have outstanding export potential for commercial production here, especially as an export variety to South-East Asia.

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## DURIAN FRUITING IN 2 YEARS

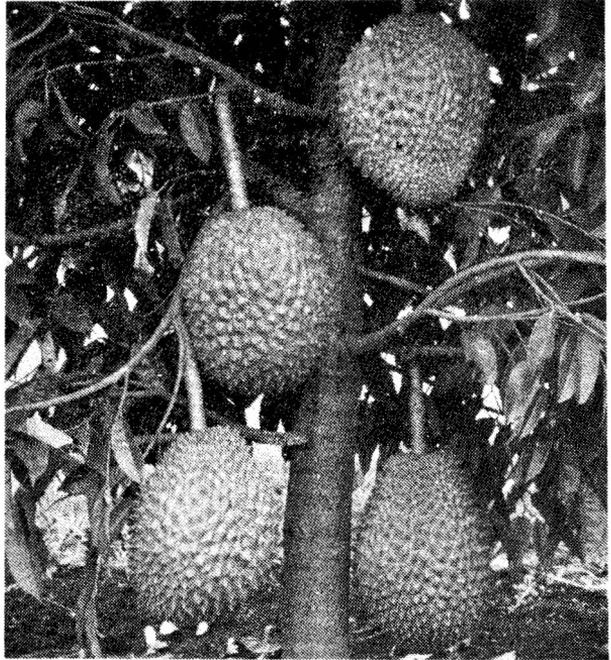
An interesting article in the Indonesian magazine Trubus (April 1990) describes a durian which has fruited within two years of budding to an improved variety.

Normally it is not possible to get durians to fruit within four years of budding, even in ideal tropical conditions.

The Durian was grown in the Cianjur (Jabar) area of Indonesia by Ratna Fauzia, on his 7 ha orchard. In November 1987 it was budded over to the variety 'Bangkok'.

In October 1989 the durian had already commenced flowering. At this time the plant was 2.5 m high.

Exactly why the durian fruited so early is not known for certain. However it may be connected with the fact that the plant was savagely battered by strong winds on two successive years.



*Durian with 4 fruits, 2 years after grafting*

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# NEEM TREES —

## Source of a natural insecticide

World-wide research is identifying a multitude of potential uses for a natural insecticide extracted from the seeds of the neem tree (*Azadirachta indica*). The insecticide azadirachtin is very effective against a wide range of pests, but is non-toxic to humans and other mammals.

A major difficulty in its development as an insecticide has been the production of a stable formulation which can be used in field situations. Research is continuing in this area. There is no evidence to date that insects are able to develop resistance to azadirachtin.

The neem tree is well adapted to hot, seasonally dry regions within the tropics. Although there are very few neem trees in Australia, the species should prosper in dry tropical parts of northern Australia. Much investigation is still required, but it appears that Queensland has good prospects to pioneer this industry with a potentially large market.

### THE NEEM TREE

The neem tree, *Azadirachta indica*, is a member of the family Meliaceae. Synonymous botanical names are *Melia azadirachta* and *Melia indica*. The neem tree is also known in other parts of the world by a number of vernacular names including nim, margossa, kohomba venpu, thini, mambu and sadu.

Neem is a long-lived, rapidly growing erect tree which reaches 10 to 14 m in height. It produces long branches and simple pinnate leaves which may be as long as 30 cm.

The figure compares the leaf shapes of neem and White Cedar or Cape Lilac (*Melia azedarach*), a related Australian tree which may be mistaken for neem. White cedar has small, black seeds enclosed in a husk; they

### NEEM IN THE NORTHWEST

Neem is alive and well in Broome!

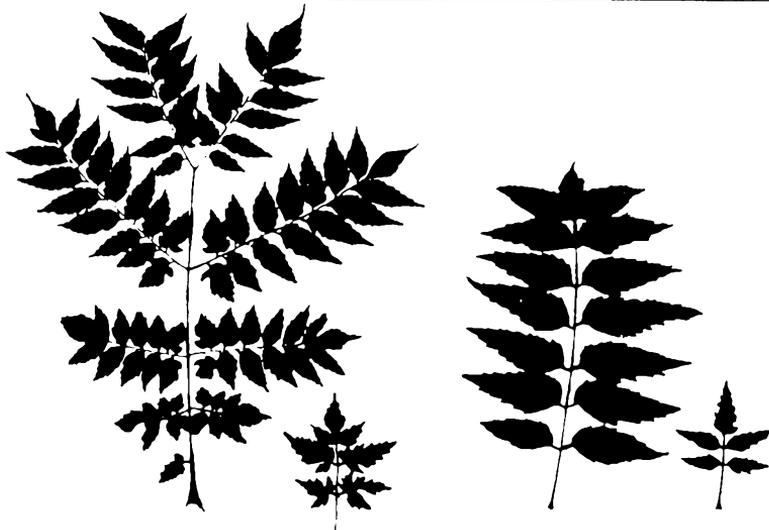
Tim Willing has several growing around the Government Offices, approx 6 m high and fruiting well. I sent some seed to Ken Herivel at Wickham.

I have some growing on my 4 ha block, 17 km NE of Broome. Growing well. I find they need a fair amount of water for their first two years, then will survive on natural rainfall (440 mm during 1989).

They become deciduous at the end of our long dry season — but quickly grow new leaves at the onset of the Wet.

Several others are planted on street trees and in private gardens here in Broome.

— **Liz Rosenberg**, PO Box 135, Broome WA 6725



Leaf from sapling

WHITE CEDAR

Leaf from seedling

Leaf from sapling

NEEM

Leaf from seedling

*Comparison of Neem and White Cedar foliage (appr. one-fifth actual size)*

resemble cherry pips and are equally hard. Neem has a brown seed resembling a small peanut, enclosed in a white husk; they are relatively soft and can be cut with the fingernail.

Each neem tree produces white, highly scented, bisexual and male flowers. The fruit are smooth and elliptical, 12 to 17 mm long; they turn greenish-yellow and fall from the tree when mature. Each fruit contains a single brown seed. Under north Queensland conditions, neem trees flower in September and the fruit mature in late December and January.

Unselected neem trees may take 10 to 15 years to bear fruit, but the University of Queensland has obtained a high-yielding cultivar that is reported to bear at three years of age.

The neem tree is an evergreen, but it tends to have a short deciduous period in unsuitable environments. Being an erect and very ornamental shade tree, it is often planted in gardens and avenues in countries where it is well adapted.

The neem tree has a deep taproot and an extensive root system which allows it to

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exploit highly leached soils and withstand prolonged droughts. Consequently it has often been used to assist desert reclamation.

Neem tree products have been put to a multitude of uses in its native countries and parts of the third world where it is naturalised. Neem tree products and their uses include: termite-resistant cabinet and building timber; leaves used as stock feed for cattle and camels; neem gum exudates used medicinally and in dyeing; neem oil extracted from the seeds used medicinally, for the manufacture of soap, and burned to produce heat and light (very smokey); neem litter and neem seed cake (after oil extraction) used as fertiliser; leaf stems are often used as tooth brushes; the dry timber is used as a fuel.

More recently the insecticidal value of azadirachtin-rich concentrates (ARC) extracted from neem seed has been recognised. Neem seed oil and several other extracts from parts of the neem tree are being used in an increasing number of commercial therapeutic and cosmetic products.

It has been suggested that companion planting of neem trees within commercial fruit and nut crops (or their use as windbreaks) could reduce insect pest problems.

#### **AZADIRACHTIN-RICH CONCENTRATE (ARC)**

Neem seed kernels contain a group of chemicals called limonoids. The most valuable of these limonoids is azadirachtin.

Increasing evidence from world-wide research is highlighting the value of azadirachtin as a most effective natural insecticide. Researchers have demonstrated its effectiveness in controlling a very wide range of insect and arachnid pests of animals and plants. Since 1980, three international conferences have been held to discuss the

latest developments in uses of products from the neem tree, particularly the use of azadirachtin-rich concentrates (ARCs) in pest control.

With increasing concentration, ARCs have been shown to make a three-pronged attack on insect pests:

- at low concentrations, ARCs disrupt the pest's normal pattern of growth and development, sometimes causing death;
- at higher concentrations, ARCs still affect growth and development. They also trigger the pest's physiological reaction to adverse conditions, cancelling their drives to feed and lay eggs;
- at even higher concentrations, they retain all of the above effects; they will also repel the pests, even without coming into contact with them.

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These valuable attributes of ARCs are further enhanced by other beneficial characteristics:

- they are considered to be non-toxic to humans and other mammals. Therefore they should not cause the residue problems on food produce that are common to many of the synthetic pesticides in use today;

- there is no evidence that they affect fish, earthworms or honey bees;

- research to date has shown no evidence that susceptible pests develop resistance to ARC.

The Department of Entomology within the University of Queensland has developed and patented technology for extracting and assaying ARC. This technology is available to the developing Australian neem industry. Azadirachtin has a complex molecular structure which has so far proved impossible to synthesise economically in the laboratory.

Its effectiveness as an insecticide in field situations will depend on the stability of formulations being developed by research workers. Further research in this area is essential for development of azadirachtin as a commercial insecticide.

### NEEM OIL

The odour of neem seed oil ranges from a not unpleasant nutty smell to an unpleasant garlic-like smell. Neem seed oil comprises about 25% by weight of the kernel of neem seeds. It has significant commercial potential in the cosmetic industry, and therapeutic uses are being researched. However, it has almost no insecticidal properties.

### ENVIRONMENTAL REQUIREMENTS

There has been little study of the ecology of the neem tree, and its environmental requirements have been only loosely defined.

It is native to dry tropical open forests in

parts of India and Burma, and has been naturalised in many other parts of the tropical world with a seasonally dry climate between latitudes of about 25° north and south of the equator.

It thrives in tropical climates with pronounced hot, dry winters, hot, wet summers and an annual rainfall of 500 to 1500 mm. It prefers high temperatures; cool weather slows its growth and young trees are killed by frost. It grows satisfactorily in a wide range of soil types, but does not prosper in fine sands or silty soils. Imperfect drainage causes rotting of the taproot, which results in loss of drought tolerance and eventual death of the tree. Neem trees will not tolerate extended flooding or fire.

Neem trees have long been naturalised in the dry climate zones of the Middle East, northern Africa, Pakistan, India, Burma, Mauritius, southern China and southeast Asia, where they have contributed to local lifestyles. The species has also been introduced to some of the drier parts of USA, as well as Central and South America and the Caribbean islands.

There are very few authenticated neem trees in Australia, and only a handful of these have reached bearing age. The seed was introduced from a number of sources, and there are distinct differences in the characteristics of the trees.

From our limited experience with neem trees in Australia, it seems that dry tropical areas of Cape York Peninsula, south of the Gulf of Carpentaria and possibly the Burdekin may be suited to the crop. Further south or at high elevation (for example, Mareeba), winters may be too cool for maximum yields.

— *G I Jamieson & M J Rice*

[ . . . . To be continued in next issue ]

# West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

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

## CALENDAR OF FORTHCOMING EVENTS

1991

May 15 Wed \*General Meeting (Stewart Washer — Genetic Engineering and Tree Crops)

May 19 Sun Field Day, Medina Area (Details p.2)

Jul 23 Tue Executive Committee Meeting

Aug 21 Wed \*General Meeting (Jen McComb — Foods from Australian Native Plants)

Sep 30 - Oct 3 §'Role of Trees in Sustainable Agriculture' Conf, Albury

Oct 15 Tue Executive Committee Meeting

Nov 20 Wed \*Annual General Meeting (Bernie Dell — Use of Mycorrhizas in Tree Crops)

1992

Mar 27-29 §ACOTANC-92: Whakatane, Bay of Plenty, New Zealand

\*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

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