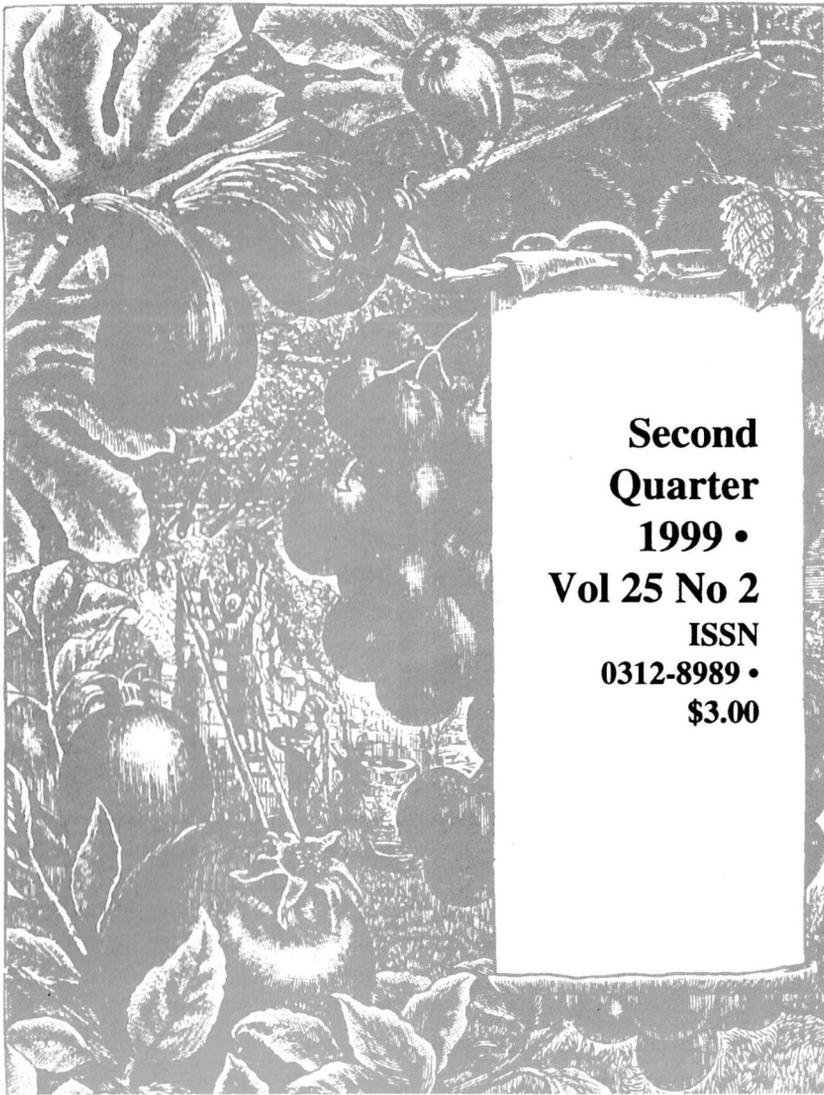




Quandong

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

Quandong • Second Quarter 1999 • Vol 25 No 2



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(See: About the Cover, p. 2)

NEXT MEETING: Tuesday May 18: 7.30 pm

At our next General Meeting, we are looking forward to hearing from **Kellie-Jane Pritchard** in the Business Liaison Group of AgWest International, the Agriculture Western Australia business unit responsible for promoting agricultural trade. Kellie-Jane will be giving us information on:

Growing Bush Foods in WA — Where are we at?

Working within the New Crops section of AgWest, Kellie-Jane has special responsibility for promotion of Australian native food plants, as part of an extensive portfolio.

We look forward to getting up to date with what is happening in this area of tree crop production, and where future emphases might usefully be directed.

Full details on attached leaflet.

Visitors welcome. Queries to Tree Crops Centre, 9388 1965.

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About the Cover

The cover design is from *Plants: 2400 Copyright-Free Illustrations of Flowers, Trees, Fruits, and Vegetables*. It is edited by Jim Harter, a very interesting collection of mostly woodcuts from Victorian times. Many individual fruits are shown, the cover is from the 'Decorative Borders' section.

Material appearing in Quandong is the views of the authors. It is offered in good faith, but neither WANATCA nor Quandong take any responsibility for any use of this material.

Aztec Fruit hits the market

Originating from Mexico, the Casimir Fruit or White Sapote (Casimiroa edulis) has proved to be an easy plant to grow in WA, but turning it into a commercial proposition here is quite another matter. Now a local grower has done all the right things to turn it into a marketing success.

[AMR Mail / 1999 Apr 7]

Tempting fruit

With an exotic flavour described as an amalgamation of smooth mango, a sweet sugary ripe pear, a touch of peach, a hint of coconut with a trace of caramel, the Aztec fruit has been hailed a taste that would tempt the gods.

Grown locally by Metricup fruit farmer Kevin Bligh and his wife Marnie, the couple decided 10 years ago not to plant extra vines and avocados.

Instead, they opted for planting an exotic fruit, the Aztec, also known as White Sapote in its native area, Central America. Ranging in colour from a glowing green to a golden yellow and from the size of a plum to as big as an orange, the Aztec fruit is more than just delicious, it is rich in Vitamin C and second only to the banana in terms of energy.

The couple planted one hectare with 400 Aztec trees, experimenting with three different varieties, all expected to bear fruit during the next couple of months, with early fruit being picked this week.

Although the fruiting season is fairly short, about two-and-a-half months, the Blighs hope that the fruit's harvest timing will follow on from the end of the stone fruit season.



Metricup fruit grower Kevin Bligh picking the first crop of his exotic new fruit, the Aztec.

Quandong Links to ATCROS

Many of the articles, advertisements, and news items in Quandong refer to organizations and people who are listed in the Directory section of the ATCROS Web Site, which is at:

<http://www.AOI.com.au/atcros>

In this issue, items underlined in the text have Atcros reference numbers listed at the end of an article or elsewhere close by. This is so that readers can get more contact details.

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

Quandong: Atcros ref. <A1466>.

Aztec Fruit: A taste that would tempt the gods

There's nothing quite like it ... creamy, smooth with a trace of caramel, a hint of coconut, a touch of peach, and maybe even the suggestion of a sweet, sugary ripe pear, the Aztec Fruit is an absolute taste sensation.

But be warned. Once you've tried an Aztec Fruit you'll never forget its unique texture and fine flavours ...

and you'll always be looking forward to your next one.

Known as White Sapote in their native Central America (literally 'sweet tasting fruit'), the Aztec Fruit is more than just delicious ... it's also rich in Vitamin C and second only to the banana in terms of energy content

AZTEC FRUIT

TASTE THAT WOULD TEMPT THE GODS

From the jungles of Central America comes a fruit with a taste so unique, so tempting that it has been called the "fruit of the gods".

Now, thanks to Malheur Valley everyone can enjoy this exotic, mouth-watering delicacy. Perfect on their own and a dream with vanilla ice cream, you'll just love the taste of Aztec Fruit!

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TANARU RIVER

Malheur Valley
10000 Hwy 101, Malheur Valley, Oregon 97631
Phone: (503) 338-2222 Fax: (503) 338-2223

And enjoying them is simple! All you have to do is halve the fruit, discard the seeds, and savour the flavours. Some say the skin is the best tasting of all, but it can be easily peeled away to relish the pure, smooth white flesh.

Aztec Fruit vary in size and colour from a glowing green to a golden yellow and from plum-size up to as big as an orange. Picked fresh, they continue to ripen after harvest and are ready to eat when gentle fingertip pressure leaves a slight indentation. Firm fruit will ripen within days, but the ripening process can be slowed by placing fruit in the refrigerator. You can even freeze them without losing flavour, so you can enjoy them out of season. Aztec Fruit are great by themselves and an absolutely terrific dessert dish. Try some ... you'll be glad you did!

"It's a big thing to introduce a totally new fruit with such a short fruiting season," Mr Bligh said. "They are a tropical fruit, but they can handle temperate conditions".

"In this climate, it has taken seven or eight years before they fruit and the venture has involved a lot of weekend work, research, and experiments with varieties. The good thing about the fruit is that they are not sprayed at all because they don't attract bugs. They have a terribly bitter skin until ripe, which keeps the birds away, and nothing much else seems to

like them."

Mr Bligh said once picked fresh, the fruit continued to ripen and was ready to eat when gentle fingertip pressure left a slight indentation. He also suggested his fruit was eaten best with icecream after halving the fruit and discarding the avocado-like seeds.

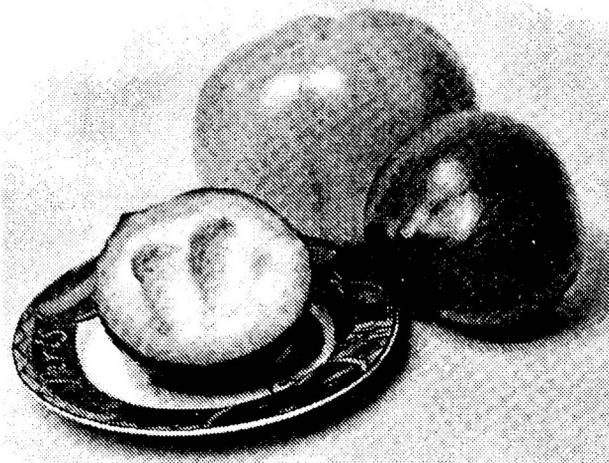
— Carolyn Cordi

WANATCA member Kevin Bligh is to be congratulated on his approach to growing and

marketing Casimiroa. This fruit has been grown in WA for some time, but never marketed professionally before.

Each fruit sold is individually packed and accompanied by a colourful leaflet produced by the Blighs' company, Walburra Valley of Busselton (part reproduced on page 4). The fruit I saw was very well sized, with a distinctive point (presumably a varietal characteristic).

Casimiroas are hard to transport when ripe, as the skin marks easily. The Walburra Valley fruits are sold while still firm — they ripen slowly over days, similar to the avocado. They are one of



Casimiroa edulis, marketed as Aztec Fruit

my favourite fruits.

—David Noël

[Bligh e-mail: walburra@netserv.net.au]

[West Australian / 1999 Mar 4]

WA sandalwood oil set for world market

Venture capitalist Foundation Capital has invested \$2 million in an Albany-based project aimed at supplying the sandalwood oil market, which is worth up to \$120 million a year.

Mt Romance Australia Pty Ltd is pitching to provide 40 per cent of the sandalwood oil used by perfume makers, the single biggest user of the fragrant oil, in five years.

Between 100 and 200 tonnes of sandalwood oil, selling at \$450-\$610 a kilogram, is used each year for a variety of purposes, including in perfumes such as Calvin Klein's Obsession and Christian Dior's Poison.

Mt Romance managing director Stephen Birkbeck said the industry was concerned about the traditional sandalwood suppliers

India and Indonesia.

The WA company, which sells emu oil products to Europe, has invested \$1 million upgrading its factory to process WA sandalwood.

— Mark Pownall

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Pomegranates — a new future for an ancient fruit?

Pomegranates have been grown in WA since the earliest times of settlement, but as far as is known has never been looked on here as a significant commercial crop tree.

In Despeissis' *Handbook of Horticulture and Viticulture of Western Australia* (1921 edition), this chronicler of fruit-growing practices in WA mentions the pomegranate only briefly, in the section on trees suitable for shelter round orchards:

POMEGRANATE (*Punica granatum*, Linne).—*North Africa and South-Western Asia; widely cultivated for its showy flowers and fruit; much overlooked regarding its value as a hedge plant; will grow freely from cuttings. Purposely cultivated in Algeria for walking sticks. Passed with very few other plants through years of drought in Central Australia. The best varieties are propagated by grafting; among these there is a practically seedless variety known to Indian cultivators.*

In actual fact, the pomegranate could become a significant production item for WA, where we have close to ideal growing conditions. Apart from export fruit (there is a considerable demand from Middle Eastern countries), there is potentially large market for pomegranate juice. Also, newer almost seedless varieties could transform public attitudes in the local market.

WANATCA member Andrew Cohen has taken the plunge in setting up what could be WA's first commercial planting. He writes:

"I will be planting about 500 trees this spring, with 1,000 scheduled for next year and about another 500 the year after (getting stock is not easy — though by the end of next year I will be producing my own ..). When fully stocked I will have approximately 3 ha of trees. I am specializing in Azerbaijani cultivars.

The name of my orchard is 'Skittery' (yes, there is a story attached, but I'll leave that for

another time) and it is located at Quedjinup, on the ridge between Dunsborough and Yallinup.

I'm always interested to talk to others about pomegranates, my mobile phone number is 0419-856 614, my e-mail is andrew@acequity.com.au."

Pomegranates are also attracting attention in other fruit-growing areas — here is a recent article from California.

[Fruit Gardener (California Rare Fruit Growers) / 1998 Mar-Apr]

Diversity for the future: pomegranate collection expanded

The pomegranate (*Punica granatum* L.) is an ancient fruit native to Persia and adjacent countries. According to Hodgson (1917), the fruit was called *Pomum granatum* (seeded apple) during the Middle Ages. This name eventually became pomegranate. Of course, Linnaeus officially designated *P. granatum* as the scientific name.

The pomegranate is mentioned in the Bible and in old historical documents. Today, while there are several varieties, Wonderful, introduced as a cutting to California from Florida by a Mr. Bearss in about 1896, remains

the most important variety grown in California.

The germplasm collection of the National Clonal Germplasm Repository (NCGR), Davis, consisted of 10 accessions in 1995. These few items, a mix of fruit and ornamental types, fall far short of the genetic diversity inherent in this variable species. Several groups from wide-ranging sources have been assembled which greatly contribute to the overall diversity of the collection. The collection now consists of 73 accessions.

A brief discussion of these groups follows:

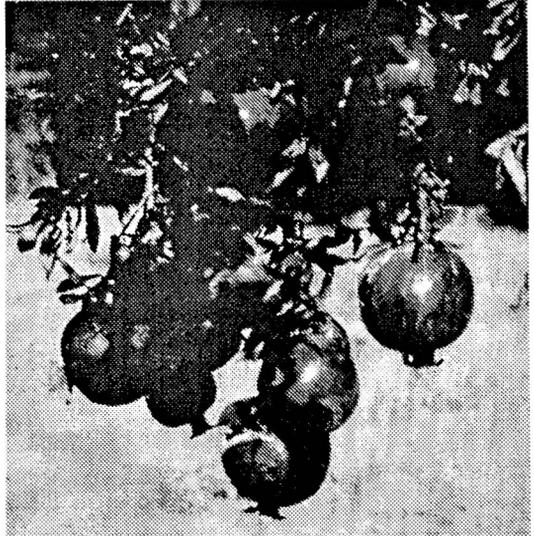
1. Ten accessions established pre-1995. Six are ornamental types. DPUN 004 and 007 are very large-fruited.

2. Seven accessions hand-carried from Turkmenistan during 1995 by George White and Dan Parfitt (Pomology Department, UCD). The variety Sverkhhranni reportedly is both early maturing and soft seeded. These seven have been field established and released from quarantine.

3. Seven varieties from CRFG member Todd Kennedy's field collection at San Martin, Calif. These are cultivars found at various locations in California and one from Palestine.

4. Ten selections of hybrids made by John Chater, Camarillo, Calif. Most display double or semidouble flowers and very large fruits. The top item is Eversweet, a patented variety with early sweetening and multiple ripening characteristics.

5. Twenty-three accessions introduced for the USDA station at Byron, Ga., from Iran and the former Soviet Union (now Turkmenistan) during 1976. Although 45 introductions were initially received, only 27



'Wonderful' pomegranate. Photo by George White

remained by 1982. These were assigned the Plant Introduction (PI) numbers 483098-483124 (White and Drexler, 1985). Currently, only 23 remain.

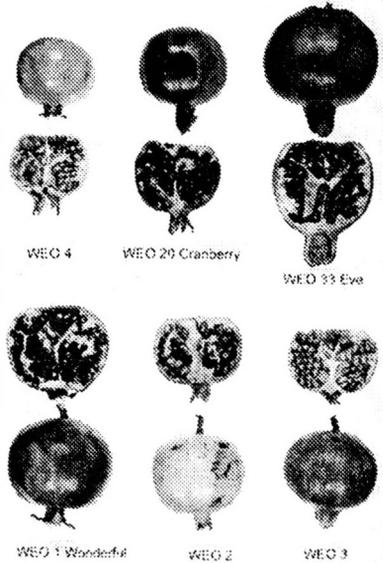
6. Twelve selections from the row of 48 old trees at the Wolfskill Experimental Orchard (WEO), Winters, Calif., that were established by the Pomology Department, UCD (see photo). Not much is known about the background of this planting, but it is said to have been established by Professor Reid Brooks in the 1950s. The first tree at the north end is the variety Wonderful. The remaining trees in the row may be recognizable cultivars preserved by the Pomology Department, or discoveries by Professor Brooks or others. Some are certainly ornamental cultivars, bearing double flowers but producing few or no fruits.

On September 17 1997, Todd Kennedy, Kay Ryugo (retired professor, pomology, UCD) and I surveyed and checked the numbering of the trees. We collated the trees with selection names and numbers assigned

by John Lovell in 1984 as reported in *Fruit Gardener* (Strange, 1988, and Sanders, 1991). We noted considerable discrepancy in numbering systems used in the past because of death or disappearance of some trees in the row. Since some cultivars collected for previous CRFG scion exchanges may be mis-named, nurserymen are cautioned to review trueness to type of their pomegranates from this Wolfskill row of trees. We collected fruits of 16 items; these were then subjected to visual and taste assessments by staff and guests at the Repository. Twelve emerged as suitable entries for the NCGR collection. All of the old trees at WEO have been securely labelled with metal tags. Our DPUN number, plus the WEO number, appears on the 12 trees.

A few of the trees have potential as ornamentals and remain to be evaluated during 1998. Cuttings from the 12 are available and repropagation for the Repository collection has just begun. 'Eve' (DPUN 089) and 'Cranberry' (DPUN 086) are excellent in terms of rich taste and productivity. DPUN 082 and DPUN 083 are soft seeded.

7. Others: 'Palermo' from Italy, donated by Steve Spangler, Vista, Calif. Dwarf types 'Chico' and 'Nana'. 'Ganesh', reportedly seedless, from India (under quarantine until November 1999).



Samples of pomegranates from the Wolfskill experimental plantings near Davis in Winters, California

All of the accessions mentioned above have been assigned PI numbers, the unique identifier of the National Plant Germplasm System. Data are accessible via the GRIN national database home page or from NCGR, Davis.

An abbreviated listing appears in the table. Our main objectives are to preserve genetic diversity and to make it available for breeding and other research purposes.

Only a few accessions will be available before next fall. Requests for green cuttings are due by May 1 and for dormant wood by December 1. For accessions received from NCGR, we require a report of results from requestors. Hobbyists and interested individuals are reminded to obtain plants from commercial sources when available. Well-documented recommendations for other items that should be considered for inclusion in the collection are welcomed.

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Table. Listing of Repository Pomegranate Accessions

(DPUN No. / PI No. / Name)		
Group 1	001	599587 Double Red-White
	002	599588 Double Red
	003	599589 Double Red No.2
	004	599590 Orange
	005	599591 Small Leaf
	007	599578 Haku-botan
	008	599579 Haku-taka
	009	599580 Kizakuro
	010	599581 Nochi-shibori
	011	599582 Toryu-shibori
Group 2	013	594962 Sverkhrraniy
	014	594963 Molla Mepes
	015	594964 Parfianka
	016	594965 White Flower
	017	594966 Dotch Legrelley
	018	594967 Hyrdanar x Goulosha
	019	594968 Hyrdanar x Kirmiay-Akbuh
Group 3	020	599510 Sweet
	024	599511 Cana
	027	599512 Daru
	028	599513 Fleshman
	029	599514 King
	035	599515 Vina
	038	599516 Balegal
Group 4	048	599111 Ambrosia
	049	599112 Blaze
	050	599113 Eversweet
	051	599114 Golding Globe
	052	599115 Green Globe
	053	599116 Loffani
	054	599117 Loulou
	055	599118 Phoenicia
	056	599119 Purple Heart
	057	599120 Rosamia
Group 5	058	483117 Mejhos 6269
	059	483120 Sakerdze
	060	483107 Al-sirin-nar
	061	483111 Kaim-anor
	062	483121 Salavatski
	063	483112 Kaj-acik-anor
	064	483122 Sejanec 2-5/8
	065	483109 Apseronski krasnyj
	066	483113 Kara bala miursal
	067	483118 Nikitski ranni
	068	483124 Zubejda (Denau)
	069	483116 Kunduzski
	070	483110 Bala Miursol
	071	483106 Afganski
	072	483108 Apseronskii
	073	483114 Kazaka
	074	483119 Saartuzski (Yalta)
	075	483123 Surh-anor
	076	483098 Alk Pust Ghermez Saveh
	077	483105 Tabestani malas Biranden
	078	483099 Dorosht 5 hahanshahi
	079	483100 Entek hobi saveh
	080	483102 Shirin Pust Ghermez
	Group 6	
	081	599517 Wonderful
	082	599518
	083	599519
	084	599520 Cloud
	085	599521 Crab
	086	599522 Cranberry
	087	599523 Mae
	088	599524 Elf
	089	599525 Eve
	090	599526 Sour
	091	599527 Dewey
	092	599528 Gold
	Group 7	
	021	599529 Nana (Calif.)
	093	599530 Palermo
	094	599531 Ganesh
	095	599532 Chico

(Note: The author thanks Kay Ryugo and Todd Kennedy for their help regarding the UC Davis Wolfskill collection. Additionally, Todd provided valuable information, recommended items to be included in the collection, and gave editorial advice.)

— George A. White, Ph.D.

Dr George White recently retired as Curator/Research Leader for the National Clonal Germplasm Repository, Davis. His current address is 11624 35th Pl., Beltsville, MD 20705.

References

Hodgson, R.W. 1917. The Pomegranate. California Agr. Sta. Bull. 276. pp. 163-192.

Sanders, Harry and Gretchen. 1991. The Pomegranates of Wolfskill. Fruit Gardener. 23(3):20.

Strange, Florence. 1988. Pomegranates more Wonderful than Wonderful, but What to Call Them? Fruit Gardener 20(1):3-4.

White, G.A., and S. Drexler. 1985. USDA Plant Inventory No. 192. pp. 3-4.

[Note: An extensive article on *Pomegranate Culture in Central Asia*, by Leonid Burmistrov, appears in our 1993 WANATCA Yearbook (vol. 17, p. 3-13)]

California Rare Fruit Growers: <A1115>

Get ready for the Bring & Buy

WANATCA will again be holding a Bring & Buy meeting in September (provisionally, at the Shenton Park Hotel carpark, opposite the Tree Crops Centre).

The date is Sunday, September 12, 10 am - 1 pm. There will be more details in the next issue of

Quandong, but:

Make a start NOW

on potting up or producing your extra nut, fruit, or other tree crop plants which you can make available.

This is the opportunity to make some money and at the same time raise the number of crop trees planted locally. Commercial sales are welcome too.

*Queries to Tree Crops Centre,
08-9388 1965.*

School moves to set up bush tucker project

In 1996 a bush tucker garden was established at Jacobs Well Environmental Education Centre, which is a Queensland Department of Education "camp" school about 35 km south-east of Brisbane, near the shores of Moreton Bay.

The garden was designed as part of an overall "learnscape" project that in time will have sensory gardens (with perfumed, aromatic and textured plants), butterfly food-plant gardens, bird-attracting gardens, local bush landscapes, rare and threatened plants, and a frog-friendly wetland. "Learnscape" is the term we're applying to our project, that uses landscaping for educational purposes.

The gardens are being constructed by centre staff and visiting children. All gardens are being watered from our grey water irrigation and being heavily mulched with Energen (Queensland electricity supplier) - supplied mulch from roadside tree trimmings. Mulching is used to reduce dehydration, soil moisture loss, and weed growth, and grey

water use solves our water problems through the lack of a reticulated water supply.

Plants used in the Bush Tucker gardens are all native species mainly from Queensland but also including some species from NT, Vic, NSW, SA but sadly at present, none from WA.

In our plantings, we've tried to include a mix of edible fruit species, edible seed species, edible leaves and edible flowers.

Back in 1980, the Principal, Glenn Leiper, established a garden of over 300 native species at another SE Queensland school, Eagleby South State School. These plants were chosen for their variety of uses by aboriginal people. From that exercise, the tastiest and most interesting species were quickly identified by staff and students. Learning from that, Glenn chose similar species, along with many others now available through the nursery trade or specialist gardens for this Jacobs Well project. Some of the species included are:

Eugenia reinwardtiana (Beach Cherry) - 1.5 m tall lillipilli with red 2 cm red fruit

Austromyrtus dulcis (Midyim) - 1 m tall shrub with 1 cm grey berries

Acronychia acidula, *Acronychia imperforata*, *Acronychia oblongifolia* - small rainforest trees with sour fruit

Ficus coronata (Sandpaper Fig) - small tree, tasty fruit

Schizomeria ovata (Crab Apple) - rainforest tree, sour fruit

Davidsonia pruriens (Davidson's Plum)

small rainforest tree, very sour fruit

Mischarytera lautererana (Corduroy Tamarind) - rainforest tree, sour fruit

Citrus australasica (Finger Lime) - native citrus, very sour but tasty fruit

Syzygium oleosum (Blue Lillipilli) tangy fruit

Hibiscus heterophyllus (Native Rosella) - edible leaves and flowers

Wahlenbergia stricta (Bluebells) - edible flowers

Persoonia stradbrokeensis (Geebung) - edible (barely) fruit

Pouteria eerwah (Red Coondoo) - rainforest tree with red fruit

Trachymene incisa (Native Parsnip) - small herb with tasty tuber.

All up, there are nearly 100 species in the gardens. The goal is not to have as many species as possible, but to have a variety of species with different edible parts and species which can grow adequately in our local conditions.

Visiting students and teachers think the idea is great and presently we're helping a few other local schools to establish similar gardens.

[From information supplied by Glenn Leiper, MS 1372, Beenleigh, Queensland 4207]

¥

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[Pacific Nut Producer / 1998 Sep-Oct]

California cotton growers switch to almonds — enough bee colonies to cover the increased area?

California almond growers know about the significant new plantings of almonds without having to read about it — all they have to do is drive around their own county.

Up and down the state, large tracts of land are being planted to almonds. Only a few years ago, after several drought years, orchard development on the west side of the San Joaquin valley came to a halt because new plantings were considered a risky venture due to an uncertain water supply.

COTTON - NO LONGER KING

In 1977 there were 1.7 million acres of cotton in California and 273,000 acres of almonds. In 1998, there were 850,000 acres of cotton and 500,000 acres of almonds. Many (former) cotton growers are now almond growers.

Today, the westside is home to many new plantings as cotton growers, plagued by low prices and high pesticide costs are switching to almonds. Throughout the state, the burgeoning almond hectareage, predicted to increase from 168,000 bearing hectares this year to 208,000 six years from now, is triggering an important question: will there be enough honey bee colonies to handle this increased area?

At the normal rate of five colonies per hectare for bearing trees (trees over five years old) an increase of 40,000 hectares translates to a need for 200,000 more colonies of bees.

While the almond industry is optimistic about the future (due in large part to the fact that there is a limited area of land in the world that meets the unique climatic requirements of almonds — cold winters, yet a frost-free bloom period) the honey bee industry has been stagnant in recent years with bee colony numbers on a gradual decline (see graph). The number of beekeepers is decreasing at a faster rate than the number of colonies with individual bee operations becoming larger (just like farm size is increasing).

A breakdown of US bee numbers by state is shown in Table 1. Virtually all commercial beekeepers in California, Oregon and Washington bring their bees to almonds as do most beekeepers west of the Rockies, and Montana and the Dakotas.

The attraction for beekeepers from the northern tier of states is not almond pollination fees, but the opportunity to winter their colonies in a hospitable environment so that they can start spring in their home state with strong, healthy colonies.

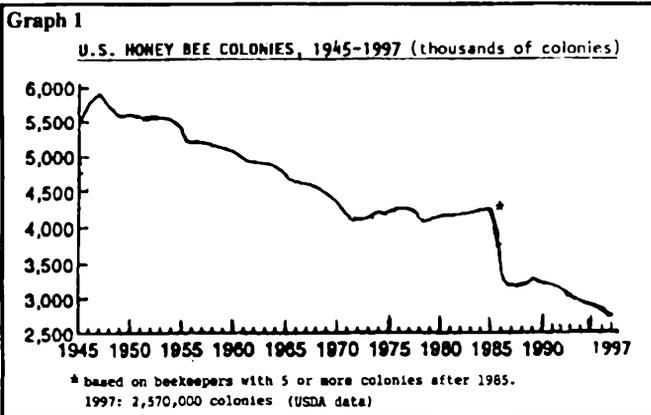
Almond pollination is not as attractive to beekeepers in the southern states because bees winter well in these states. Texas does ship a considerable number of bees to California for almond pollination and there have been sporadic deliveries from other southern states, even Florida. Although there is a large bee supply in Florida, almond pollination fees would have to increase significantly before Florida beekeepers made the trek to California in large numbers.

For northern and eastern beekeepers, the decision to pollinate almonds means spending up to six months out of the year in California

at the cost of a major disruption in family life, both for the beekeeper and his hired help. It would be comparable to an almond grower loading up his almond crop each fall, trucking it back east and tending it and trying to sell it for several months. Few almond growers would put up with such a life style and such a life style is not attractive to many beekeepers.

Mexico probably has around 1 million bee colonies but Africanized bee restrictions likely preclude Mexican bees from coming to California. Canada has 510,000 bee colonies, with the four western provinces (Alberta, Manitoba, Saskatchewan and British Columbia) accounting for 70 percent of the total; however Canada will not allow honey comb nor bees back into Canada once it has been shipped out. It is quite possible to ship Canadian bees to California in the winter in disposable pollination units (DPUs) if methods could be found to hold the bees until almond bloom (many Canadian beekeepers store their colonies underground during the winter so this is not an insurmountable obstacle).

Income from honey production has always been the backbone of the bee industry, especially for beekeepers outside of California, and the number of bee colonies in the United States has closely followed honey prices. There was a big increase in bee colony numbers during World War II because honey substituted for rationed sugar and because beeswax was used instead of petroleum products to waterproof ammunition and other war equipment. A honey price support program initiated in 1949 was quite helpful to



beekeepers until it was cancelled a few years ago.

Honey prices declined after World War II, as did the number of beekeepers. Honey prices were depressed in the 1980s and early 1990s due to the influx of cheap imported honey, primarily from China. The bee industry gathered evidence that China was dumping honey in the U.S. and anti-dumping measures were enforced against China in 1996. The bee industry was ecstatic as it saw honey prices climb from 60 ¢/lb in 1995 to 90 ¢/lb in 1996-1997. This price increase sparked a flurry of activity in the bee industry as beekeepers expanded their numbers and as new people got into the business. Unfortunately, this spike in the price of honey was shortlived as imports from other countries, particularly Argentina, took up the slack left by decreased China imports. Honey prices today are back around

Honeybee Pollination Increases crop yields

Contact the *W.A. Pollination Association Inc*
<A1940> for Beekeeper pollinators
Ph (08) 9450 2912 or (08) 9276 7847

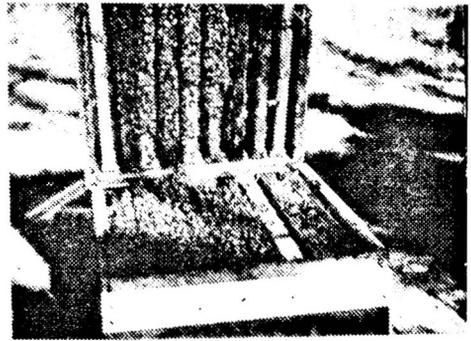
60¢/lb. and are likely to stay there, as dumping cases will be difficult to make against Argentina and other countries. Unlike almonds, honey can be produced in virtually every country in the world and with free-trade measures, honey prices to U.S. beekeepers will mimic world prices for honey for the foreseeable future.

Depressed honey prices are a two-edged sword for almond growers. With high honey prices, some midwestern beekeepers did not bring bees back to almonds in 1997 (some wintered their bees in Texas rather than California) thus reducing their dependence on pollination fees, especially almond pollination fees, to stay in business; more bee colonies are available for almonds, but higher fees must be charged for the beekeeper to stay in business.

How to Increase the Bee Supply for Almonds

In order to get the increased bee numbers needed for almonds, one answer might be to pay more per colony — just as the bee industry responds to higher honey prices by increasing colony numbers, it could respond to higher almond pollination fees by doing the same. Unfortunately, beekeepers cannot survive on almond pollination fees alone and if almond pollination fees were raised to levels necessary to increase bee numbers, almond growers could not afford to pay them.

The best answer to increasing the bee supply for almonds is not to increase bee colony numbers, but to increase the number of bees in each colony. The number of bees in a colony is relatively constant during the summer when there are abundant flower sources, but the number of bees per colony in the winter (when almonds bloom) varies greatly from colony to colony and from beekeeper to beekeeper.



An 8-frame colony

Many almond growers are stuck in thinking in terms of bee colonies per hectare while they should be thinking in terms of frames of bees per hectare. The average frame strength of bee colonies used for California's entire almond hectareage is closer to six frames of bees than eight frames in most years. Twelve frames of bees per hectare should do the pollination job. If the average colony strength of almond bees was increased to eight or nine frames of bees there would be more than enough bee colonies to handle the increased hectareage. In fact, there might even be a surplus of bee colonies even if the same number of colonies available in the year 2004 was the same as that used in 1998.

So how do beekeepers increase the number of bees in the colony during the winter? It is not that difficult to do if bees are fed pollen or a pollen substitute during the fall and winter. Such supplemental feeding causes queen bees to start laying eggs well before almond bloom with a subsequent significant increase in bee populations during almond bloom. UC tests have shown that bee colonies provided with supplemental feed during the fall and winter collected 49 percent more almond pollen during almond bloom.

Many beekeepers use supplemental feeding to build their colonies to six or eight frame strength for almond pollination. These

bees are usually wintered in the San Joaquin and Sacramento valleys (Southern California beekeepers can usually depend on wildflower sources to build their bees during January). Providing all bee colonies wintered in the Central Valley with supplemental feed would go a long way toward fulfilling almond bee requirements for future years. The number of bee colonies would not change, but the number of bees in each colony would increase dramatically and growers could then use fewer colonies per hectare (see Table 2).

Supply-Demand

As the supply of a commodity stays constant in the face of increasing demand, two things happen: the price of that commodity increases and the quality of that commodity (colony strength in the case of almonds) drops. Sometimes a hoarding mentality takes over when a commodity shortage occurs and this only exacerbates the situation. By demanding more bees per colony (stronger colonies) and shooting for 30 frames of bees per hectare, individual growers can use less colonies per hectare and the number of colonies needed for California's almond hectareage 5 or 10 years

Table 2. Bee Colonies Needed for Almonds*

Colony Strength	Cols. Needed per hectare	Cols. Needed for 200,000 ha
8 frame	2.5-4	750,000
6 frame	5	1,000,000
4 frame	7.5+	1,500,000

*Some growers increase the number of colonies per hectare as a hedge against poor bloom weather, however the 1998 season showed thtat growers using 8 frame colonies at 2.5-4 per hectare got the same yields as those that used 5+ cols. / hectare.

down the road should be the same as it is today.

Many almond growers are well aware of the colony strength they are getting, either by first-hand observation or by independent inspection for colony strength. Growers that know they are getting colonies containing eight frames of bees or better can cut back to 3.8 to 4.4 colonies per hectare, thus releasing more colonies for the rest of the state.

By continuing at the same number of colonies per hectare, the almond industry is inviting a bidding war for bees that could drive bee rental fees to uneconomical levels. Beekeepers, like almond growers, are also aware of the increased almond hectareage; they have put the numbers together and some are rubbing their hands in anticipation of a big jump in pollination fees coupled with less scrutiny on colony strength. Paying beekeepers a nominal extra charge for strong colonies (to cover supplemental feeding costs) and reducing the number of colonies used per hectare is far more sensible than getting into a bidding war for a fixed number of bee colonies.

— Joe Traynor

[Conversions to metric units by the Tree Crops Centre]

Pacific Nut Producer: <A3023>

Table 1. Distribution by State of US Bee Colonies

1997 USDA Data (In thousands of colonies)

AL	14	IA	51	NE	61	SC	5
AZ	32	KS	17	NV	14	SD	240
AK	40	KY	3	NJ	8	TN	6
CA	400	LA	38	NM	15	TX	94
CO	35	ME	8	NY	72	UT	32
FL	240	MD	6	NC	8	VT	5
GA	75	MI	85	ND	245	VA	8
HI	9	MN	145	OH	22	WA	54
ID	120	MS	19	OK	4	WV	8
IL	7	MO	24	OR	47	WI	79
IN	8	MT	107	PA	22	WY	38
Total Colonies = 2,570,000							

[Countryman Horticulture / 1999 Feb 4]

Albany chosen for avocados

When John Swain announced his avocado venture in Albany the typical assessment among friends and agricultural authorities was that he had gone mad.

"Everyone said we had to move to Carnarvon if avocado growing was our dream," he said.

"They simply thought we were out of our tree to even try and grow them in Albany."

But Mr Swain and his family had moved to Albany with the specific aim of growing avocados.

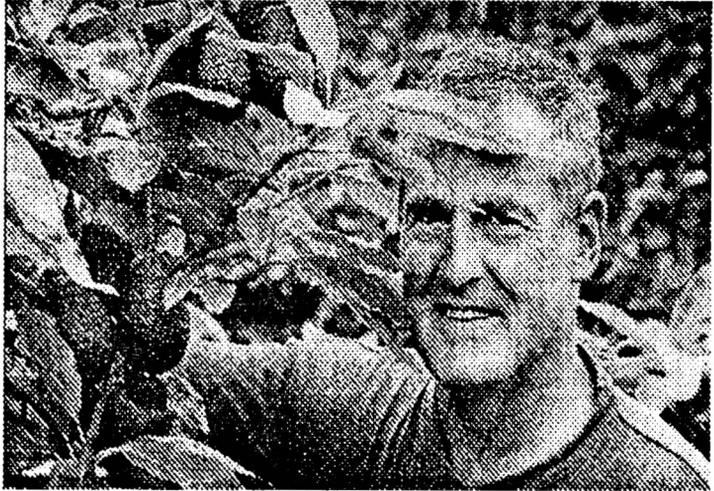
Originally from California, they scoured climate charts from around the world to find a suitable location for their new venture — Albany fitted the bill perfectly.

"We grew some avocados in California, and with the money we got for selling there we bought this 75 acre property," he said.

That was 24 years ago and while most people would assume that the Swains would by now have reached peak production, that was unfortunately not the situation.

Their enterprise — about 20 km from the centre of Albany — took a back step early on in the venture when the grafted avocados they obtained from Queensland were found to have Jarrah dieback.

"Consequently we have been battling that problem ever since," he said. "Our production increases each year but I don't really know when we will reach our peak."



Despite set backs early in the venture, John Swain is confident of the future of avocados in Albany

Fortunately Mr Swain had a full time occupation as a school teacher and did not rely on the income from the orchard for financial viability, although the ease with which the crop was sold did augur well for him in the future.

All of the crop from the 400 trees was now sold, predominantly to local enterprise, Farm Fresh Wholesalers, who also had a retail outlet.

And even if production did increase dramatically, a harvesting period that started after Gingin supplies were all picked ensured good prices.

He said people who tasted his avocados typically claimed they were more flavoursome than those grown north of Perth, but always the diplomat, Mr Swain said he only ever ate his own product.

More about red loam

Back in the 2nd Quarter 1996 issue of *Quandong*, an article about the *Gevuina* or *Avellano Nut* (*Gevuina avellana*) from Chile and its Australian relative the *Red Nut* (*Hicksbeachia pinnatifolia*) mentioned red loam.

Both these species, macadamia relatives in the Proteaceae family, are subject to 'Sudden Death' syndrome. With this, plants can be growing well one day, and perhaps reach a metre in height with glossy green leaves. Look again a week later, and the plant may have lost all its vigour and gloss, to die completely within another week or so.

This behaviour has been an unsolved mystery which occurs widely (New Zealand, California, Australia, even Chile itself). However, the article mentioned work from Chile which suggested that their species was very sensitive to organic matter in the soil, and that much better nursery success had been obtained using red loam very deficient in organic matter as a raising medium.

At the time I had a few small Red Nuts growing from seed, in my normal high-organic growing/compost mix. When the red loam information came up, I got some red loam

from a low-organic subsoil horizon at Dwellingup and re-potted one of my Red nuts in this.

Now, almost 3 years later, the re-potted specimen is the only one which is still living and growing normally (although still quite small, it does have normal leaves and grows new ones occasionally). Flushed with this small success, I tried re-potting in red loam with some of my other problem species. Some have responded very well, including a jaboticaba (previously approaching a lingering death), a miracle fruit (also formerly expressing a strong death wish), and lately a marula (was growing a full centimetre a year, after re-potting added another 15 cm).

But the most dramatic experiment was with lychee seedlings (see photo). In 1996 these were all the same size, about 10cm high, growing in a good sand/compost mix which suits many of my plants. In that year I re-potted one plant in red loam.

Within a few months the red loam started showing effects, and each year these became more obvious. Now (April 1999) the red-loam lychee is four or five times the height of the others (which have hardly altered), with many leaves and a much thicker stem. Apart from the growing medium, all five plants have been identically treated.

Whatever the reason for the red-loam success, it does



seem undeniable. There may be an effect from water retention (my normal mix drains rapidly, in a minute or so, the red loam holds surface water for perhaps 30 minutes). It may be something to do with pH values. The original Gevuina work led to the suggestion that the effect might be due to enhanced sensitivity of the special proteoid roots produced in the macadamia family — this now seems less likely, as these later successes are not in this family.

Some years back, Julie Firth successfully germinated and grew on two Mahwah seeds (*Madhuca longifolia*, source of high-sugar flowers and edible oil) for me, and kindly gave them to me in plastic bags. I was surprised how heavy the nursery mix was that she had used.

I planted one Mahwah out in my garden, in enriched Perth sand, and it has grown reasonably well, but nowhere near as well as the one I left in the original heavy mix. So the conventional wisdom that potting mixes should be light and free-draining may apply to many plants, but not, it seems, to all!

— David Noël

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[*Tropical Fruit News* / 1997 May]

Airlayering made easy

When TFN Editor Bob Cannon came to our Bal Harbour grove last year to put on a few airlayers, there was nothing unusual afoot: at first. When he commenced stuffing clear plastic bags with sphagnum moss I wondered, What was going on? I assumed he lacked the usual finger dexterity to be able to hold dampened moss around the girdled limb without dropping most of it on the ground. I was only mildly interested, feeling Bob was using the moss-filled plastic bags as a ploy until he mastered the more normal methods of producing airlayers.

After some of his marcots were completed I had a chance to inspect the results. I found each presented a symmetrical round ball without any of the sphagnum protruding from underneath the layer, as it frequently does, forming a wick and drying out the rootball. Curious, I decided to experiment with this unique approach myself. I put six marcots on our 'Emperor' lychee (*Litchi chinensis*).

It was amazing how quickly and effortlessly these were attached to the girdled branches. With all the moss located inside the plastic bag, there was nothing to fall out. To enable the future emerging roots to enter the bag and penetrate the enclosed moss, a centred crosscut



The fully rooted lychee marcot

was made halfway through the bag. This was now wrapped around the girdled part of the branch and tied (I tied 20 cm long grafting rubber strips).



Sphagnum moss-filled bag will be cut halfway through on the black line and wrapped around girdled branch

Bob uses several refinements. He pre-wets his moss in a water solution containing soluble fertilizer and a rooting hormone. Our RFCI Editor first got the idea of stuffing bags with sphagnum from the late Morris Arkin of carambola (*Averrhoa carambola*) fame. By varying the dimensions of the plastic bags, marcots from the size of a golf ball to a pumpkin can easily be made. Heavy aluminium foil is usually put around the

completed airlayer to exclude light and offer extra protection.

Most marcots require up to three months to fully root out. If this system was such a winner for me, I'm sure it will do the same for you. Why not give it a try?

— William F. Whitman

Tropical Fruit News: <A3137>

Native Tamarinds

We are now harvesting Small-leaved Tamarind (*Diploglottis campbellii*) and have a large quantity of seed available. The species is classified under the NSW Threatened Species Conservation Act 1995, as 'Endangered' and is therefore worthy of cultivation for this reason alone.

The Small-leaved Tamarind is a highly ornamental tree, which has been planted extensively in parks and gardens as a small shade tree. The tree usually grows up to 10 m. in height under cultivation, although large trees of up to 24 m have been found in the wild. It has a dense, shady crown formed by dark, glossy, pinnate leaves and produces a large fruit in Summer.

The fruit is a hard capsule enclosing 1 to 3 woody seeds. Each seed is surrounded by a bright red or yellow, fleshy aril, giving the fruit a most decorative appearance. The aril is edible and has been described as having the best flavour of all the native Tamarinds.

Though sour in taste, it can be used to make drinks, sauces, jams and jellies or used whole as a garnish and lends itself well to use in Asian-style cuisine. Therefore, it has great potential in the Bush Tucker Industry.

The Small-leaved Tamarind is from the Sapindaceae family and is related to such commercial fruits as the Rambutan, Litchi and Longan. The tree is easily propagated from seed, germinating in 2 to 3 weeks, but seed must be sown as fresh as possible. It is very difficult to propagate from cuttings (as for Lychees).

Growth is slow when young and the tree fruits at approximately 7 years of age, having few pests and diseases. The tree requires a sheltered site with full sun or partial shade and prefers good drainage, with high nutrient and water supplies. It has been successfully planted as a street tree in temperate climates.

— Erika Birmingham, Byron Bay Native Produce, PO Box 232, Bangalow, NSW 2479 <A3265>.

[West Australian / 1998 Nov 4]

State can reap carbon harvest

Talks to be held in Argentina in the next fortnight could hand WA a multi billion-dollar industry as last year's Kyoto signatories meet to line tune the details of carbon trading.

It could be money which grows on trees. Carbon trading — a system which puts a value on efforts to decrease greenhouse gas emissions— was one of the most publicised results of last year's Kyoto conference which saw many countries commit themselves to reduce emissions targets.

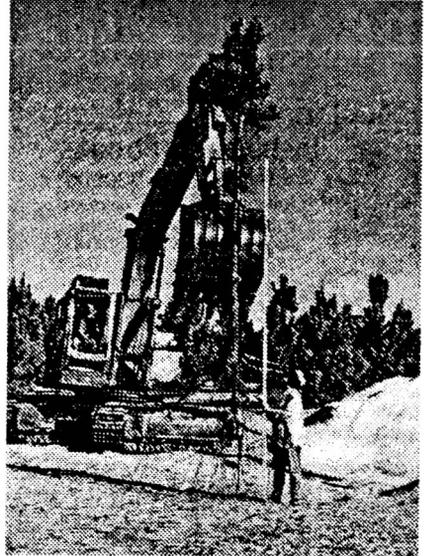
In theory, trading works like this: so-called green countries which reduce pollution would be rewarded by being able to sell unused portions of their emission targets. At the same time, countries and companies can plant trees and sell the right to that stored carbon to cancel out emissions.

Proponents of carbon trading say an international system would be both lucrative and necessary to Australia. Under the Kyoto protocol, Australia is only allowed to increase its emissions between 2008 and 2012 by 8 per cent (estimated to be about 40 million tonnes) over its 1990 levels.

According to the Department of Conservation and Land Management, proposed resource projects for WA alone would have emissions equal to the country's total extra allowance. Using carbon credits to cancel out some of those emissions will be vital, CALM says, if Australia is to meet its international commitments.

It may also signal a new boom industry for WA, which has a land mass capable of taking an extra 800,000 ha of trees. CALM chief executive, Syd Shea, said WA had the capacity to lock up 200 million tonnes of carbon over the next 30 years.

"The value depends on the market price which is quoted at about \$US10 (\$16)," Dr Shea said. "It remains to be seen how that price will change, but it could well rise."



A worldwide system of carbon trading could result in a rush of tree planting in WA

At a return of \$16 a tonne, the long-term value of carbon credits from WA trees would be worth about \$3 billion.

Already the British Government has made public its hopes that a carbon credit system could earn it up to \$2.7 billion by 2010 on a much higher return. Although only required by Kyoto to reduce its greenhouse gas by 12.5 per cent, Britain says it is on track to hit a 20 per cent reduction, leaving a credit for 15 million tonnes of carbon for sale.

It estimates the credit can be sold, probably to the United States, which emits about 1.5 billion tonnes annually, for at least \$160 a tonne. The Chicago Board of Trade has estimated the global turnover of greenhouse credits could exceed \$150 billion once a common system is established.

While it is less than a year since Kyoto, Australia is at the forefront of industrialised countries looking at trading. New South Wales, which saw the world's third carbon trade take place in June, is pushing ahead with plans to make itself the regional headquarters for emissions trading. NSW government-owned energy group Pacific Power bought the rights to 1000 ha of State forest plantation for a price reported to be about \$35,000. The State Government has also announced plans for world-first legislation assigning investors the legal right to carbon in tree plantations.

John Hughes, senior vice president of BT Alex Brown, which worked with the NSW Government to negotiate the Pacific Power agreement, and a similar deal with Delta Electricity, said it was still difficult to assess the potential value of an emissions trading market. "There have been some very bullish commentary that (emissions trading) could eclipse the equity markets in the Australasian region," he said. "It is very hard to put a real figure on it."

Les Hosking, chairman of the Sydney Futures Exchange, is less circumspect, putting a total contract value of Australian trades at \$3 billion within two or three years. "On a global basis it has the potential to be quite enormous" he said. The value would rise significantly if it was expanded beyond trades between agricultural markets and emitters, to individual activity such as driving a car.

Mr Hosking said his goal was to have an emissions trading system run through the SFE, offering spot and future prices on carbon within six to 12 months. He expects the timetable to remain, even if there are no clear results from Buenos Aires, where the SFE will be represented.

"If we are second to set up the program in Asia then we don't have the greatest

opportunity," he said. "Australia has the opportunity to be very influential in emissions trading, we have the most to gain and the most to lose.

"We rely strongly on black coal but we also have very large forests and sinks which can be used to cut emissions."

The greatest hindrance in the search for a truly green dollar bill may come from an unlikely source — the Federal Government.

Special adviser to the Government on emissions trading, David Harrison, said trading which was taking place before a national system was introduced bore some risks. Until all the definitions and aspects of the Kyoto Protocol were finalised, there was no guarantee that currently traded carbon credits would comply with the rules, he said.

In particular, the protocol limited forestry activities which could cancel out carbon to "afforestation, reforestation and deforestation". "We basically won't know how these terms will be defined until the middle of 2000," Mr Harrison said.

That may result in too great a delay, according to CALM's Dr Shea, who said trees planted after 2001 would not reach their peak until between 2008 and 2012. Under current international rules, the total amount of carbon sequestered in trees will be measured in those two years and averaged out to give a yearly rate.

"The dilemma is this uncertainty trying to work out the Kyoto rules," he said. "If we don't get planting until 2001, 2002, 2003 it is going to be difficult to get the planting areas which will be needed to meet that period's (emission) target.

"We could feasibly start planting tomorrow."

— *Ruth Callaghan*

WANATCA's new website now in operation

The Association's website has been completely revised and updated. The new version replaces one put together when the world was young, and with rapid development of the World Wide Web, the old site had become outdated and a disgrace.

The new site offers quick and convenient access to the various aspects of WANATCA's operations. Different pages include membership benefits and rates, and a map of the state divided into zones, with recommendations for different fruits and nuts for the various zones.

The site also provides on-line subscription facilities or a printout form.

Since its introduction, the new site has had a pleasing number of accesses. However, there is still room for improvement, and comments and suggestions would be welcomed.

The site is at:

www.AOI.com.au/wanataca

A related site of special interest to WA readers is the 'Main Fruit & Vine Crops, WA' page, Table M in the extensive ATCROS site at www.AOI.com.au/atcros. Among other things, this table lists currently-recommended varieties for the many fruits and nuts.

Many thanks to Neville Shorter for all his work in compiling and revising the information in this table.

[The Organic Grower (WA) / 1998 Dec]

Rare fruit in Bill Napier's garden

Red Pitayas

Bob Nederpelt brought these in from Queensland: they're a tree-climbing cactus, usually grown up a legume tree, and are grown commercially on volcanic slopes in Nicaragua. They produce magenta fruit; a yellow variety is slightly more aromatic — they look like watermelons when you cut them open. Pitayas should fruit in a year and a half, but mine haven't.

They need a very strong support, because they are quite heavy once they are growing well: Pitaya would be expensive to set up commercially because of the strong supports needed. They look stunning, and are marketed to hotels — they taste good too. Though Pitaya are cacti they have scales instead of thorns. Bob Nederpelt has both red and yellow varieties.

For Sale

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John, Linda Price: 08-9497 2302

Bill Napier: 9399 6683

Pistachio Nuts

These have several problems: they take about five years for the males to produce pollen, and then there are five varieties of male, producing pollen at different times. Varieties 1, 2 and 3 are best over here, as 4 and 5 are too late. If you have an early one, you can collect and store the pollen, then use it at different times to get a spread harvest. (Commercially they aim for all to ripen at once). So after waiting five years you may find that the pollen comes at the wrong time for the female trees. They are also very susceptible to verticillium wilt, which you get on tomatoes, so you must be careful how you water them. They have a chill requirement, but you can buy low chill varieties. They are very sturdy growers if watered correctly, and are almost impossible to kill.

Litchi (*Litchi chinensis*)

There is no reason why we shouldn't all have these growing in our home gardens. However, there are one or two problems. The salinity of scheme water is enough to kill leaves on which it lands, so trickle irrigation or low-throw sprinklers are best.

Next, the trees you buy here are essentially cuttings, which don't produce a tap root. Roots only go down about 600 mm and have difficulty getting enough water and minerals. So most litchis that people plant just die from lack of understanding. They mostly suffer from deficiencies in zinc, copper and manganese: using a trace element spray (about 1%) causes a dramatic improvement.

These are under-storey trees, so should be grown under shade cloth for the first few years. They can't stand alkaline sand, such as we have in lowland Perth, so you will have to correct the pH. In Perth they are only available grown from air layers: they would probably

be better grafted onto longans.

Longans (*Euphoria longana*)

Everyone could have these growing in their garden. Frost kills both litchis and longans, but they are tolerant of water logging. They are small trees, and, like litchis, respond to pruning by producing more fruit. In Queensland, litchis must be cinctured (almost ring barked) to make them fruit, but in WA conditions are bad enough to make them fruit well.

Mangos

These (usually grafted) grow and produce well in Perth. When young they are frost sensitive. In lowland Perth they suffer enough stress to fruit well, and they produce less fibre under these conditions. They tend to produce fruit in Perth just at the end of the season, when the price skyrockets, and are less troubled by fruitfly than up North.

Persimmons

The astringent ones taste better, unless you prefer the overpowering sweetness of the Fuji variety. Just let them ripen until very squashy to get rid of the astringency. If you surround the fruit for two days with carbon dioxide (eg from dry ice) the astringency disappears while the fruit are still firm.

Hazel Nuts

We could all be growing these, they are a good under storey tree.

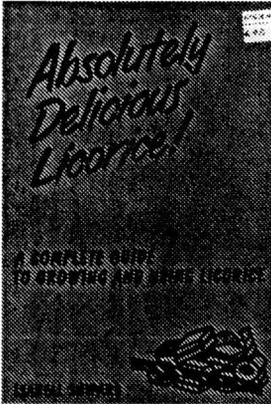
Bush Foods

We should take up growing more of our resources that we have neglected, like the macadamia nut! We could grow bush tomatoes in our back gardens, and there is a market for them now. Current outlets for bush foods are "The Grocer" in Claremont, and "Milligan's Gourmet Gallery" in Swanbourne.

— *Bill Napier* (report by Ian McAllister)

Notes on New Books

by David Noël

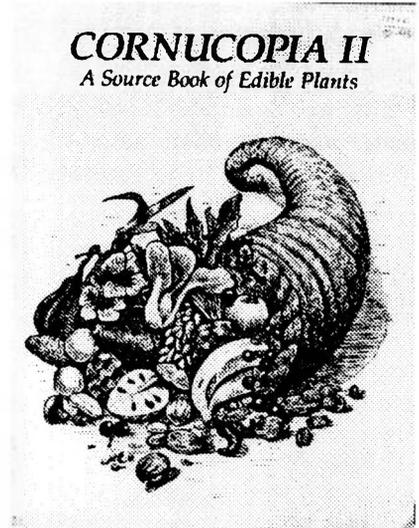


Absolutely Delicious LICORICE! A Complete Guide to Growing and Using Licorice. Isobel Shipard (Aus, 1993). 25p. Pb. Valuable booklet on this neglected niche crop, only writeup known to us. *\$6.95

Real possibilities for someone to turn this into a commercial Australian industry. Licorice is the root of a leguminous shrub.

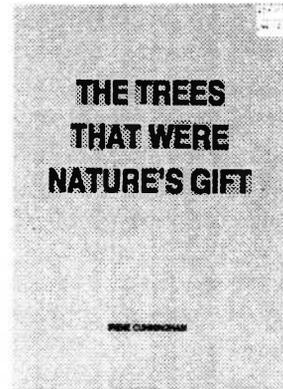
CORNUCOPIA II: A Source Book of Edible Plants. Stephen Facciola (US, 1998). 713p. Pb. Updated edition: Stupendous, unique, all-embracing compendium of 1000's of edible plants worldwide, comprehensive variety listings, global supply sources. Very highly recommended, indispensable for plant introducers. *\$82.95

The first edition of this monumental work won world-wide acclaim. This is the new edition, expanded, and newly arrived.

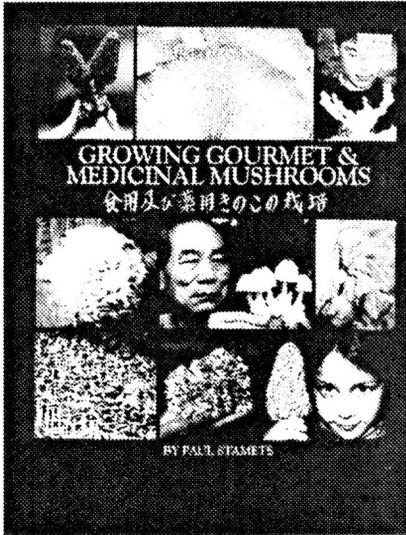


The TREES That Were NATURE's GIFT. Irene Cunningham (Aus, 1998). 291p. Pb. Unique, first-class book on 57 of the most important and interesting trees of Western Australia (incl. sandalwood, quandong, sheoak, kurrajong, boab, native ebony) - all their uses, social history, botany etc. Packed with data, no pictures. Highly recommended. *\$24.95

Here for the first time is a valuable account of familiar and rarer WA trees, how they figured in our past and in our present. Based



upon a series of carefully-researched articles which first appeared in the 'West Australian' newspaper.

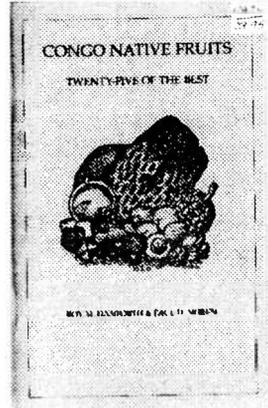


Growing GOURMET & Medicinal MUSHROOMS. Paul Stamets (USA, 1993). 554p. Pb. Highly recommended, well-illustrated, practical manual on different mushroom production techniques, growing over 25 gourmet types. A neglected crop area in Australia. *\$84.95.

Everything you need to know to go into production of these exotic edible fungi, exotic to us but familiar in parts of Asia and Europe, An outstanding production.

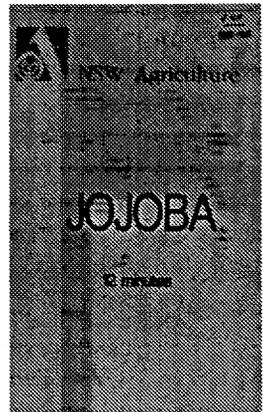
CONGO NATIVE FRUITS: 25 of the Best. 3 ed. Roy Danforth & Paul Noren (USA, 1997). 72p. Pb. Unique sourcebook on valuable but generally unknown fruits from the northwest Congo, produced by American missionaries. Many possibilities for Australia, further 25 fruits briefly described, colour illustrations. *\$29.95

Information on native fruits of this area is very hard to come by, and it is even harder to find illustrations of them — some relatives of better known fruits (custard apple, persimmon), others unique to their area. A huge debt is owed to these missionaries for their work — and they will even supply seeds!



JOJOBA. (Video, Aus, 1998). 12 min. Excellent visual introduction to Jojoba farming - setting up, establishment costs, new Aust high-yield varieties, likely income. Recommended. *\$25.95

After a period of over-promotion and incompetent management, jojoba, source of a unique oil used in cosmetics and specialist lubrication work, is making its way back into a true commercial crop, thanks to Australian work on new varieties and extensive research on growing conditions and methods.



** Prices at Granny Smith's Bookshop (see ad p. 31)*

[*The Nutshell (Northern Nut Growers Association) / 1998 Sep*]

Asimoyer sensitive to soil pH — vinegar fix!

I attended my first NNGA Annual Meeting this year. In addition to meeting many nice people, I learned a lot, but two of the sessions were of great value to me: the grafting workshops and the lecture on meristematic dieback of greenhouse grown paw paw.

Although it was too late in the year to use all the great grafting and budding techniques I learned, I will apply them next year.

I had started paw paw [QEd: American papaw, *Asimina triloba*, not Papaya] from seed last year and some this year. Just before leaving for the Annual NNGA Meeting, I noticed that many of my seedlings had a yellow, wilted look to them. We had been experiencing really hot weather, and I attributed the seedlings' condition to the weather. While listening to the lecture on paw paw, I realized that my seedlings might be suffering from too high soil pH also.

When I got home, I immediately tested the paw paw soil pH. It tested 6.8 — too high. Not having sulphuric acid on hand or the mathematical background to do the calculations for its use, I decided to use what I had at hand to acidify the soil: white distilled vinegar and a soluble, complete fertilizer formulated for acid loving plants. I added 1/3 cup vinegar and 5 tablespoons of fertilizer to 20 litres of water. I saturate-watered the paw paw seedlings with this solution and again a week later.

Four days after the first watering, the seedlings' new leaves were erect and bright green.

Two weeks after the second soaking, the seedlings' health and vigour were much improved, and the soil pH tested 5.8. Some of the seedlings had doubled in size in just three weeks!

I am sure I would have lost many of these seedlings if I had not acidified the soil. So you now know I got immediate benefits from attending the Annual NNGA Meeting.

— Donald G. Cobb, 625 W. River Rd, Waterloo, NY 13165. E-mail: Ann C Cobb <acc3@nysaes.cornell.edu>.

Rare fruits in Tasmania

One of our recent e-mails:

From: "John Harrison"

<techmark@netspace.net.au>

Subject: RARE FRUIT TREES

To David Noel:

I was given you as a contact by the California Rare Fruit Growers Assn. I have undertaken a study to find alternative agricultures for farmers in Tasmania due to the demise of wool.

Do you know any place I can get hold of rare fruit bearing trees and bushes such as: ACEROLA (Barbados or West Indian Cherry) *Malpighia punicifolia* L., Avocados *Persea* species, BABACO (Mountain papaya) *Carica pentagona* Heilborn CAPE GOOSEBERRY *Physalis peruviana* L., CAPULIN CHERRY *Prunus salicifolia* HBK., CARAMBOLA (Star Fruit) *Averrhoa carambola* L., CHE Cudrania *tricuspidata* Bur. ex Lavallee, CHERIMOYA (Custard apple) *Annona cherimola* Mill., EDIBLE HARDY PALM FRUITS: *Palmae* Guadalupe Palm; Jelly Palm; Chilean Wine Palm; California Fan Palm FIG *Ficus carica*

L., TROPICAL GUAVA *Psidium guajava* L., HARDY KIWIFRUIT *Actinidia arguta*, KIWIFRUIT *Actinidia deliciosa*, JUJUBE (chinese date) *Ziziphus jujuba* Mill., LOQUAT *Eriobotrya aponica* Lindl., JABOTICABA *Myrciaria* spp., LYCHEE *Litchi chinensis* Sonn. MACADAMIA *Macadamia* spp., MALABAR CHESTNUT *Pachira aquatica*, MIRACLE FRUIT *Synsepalum dulcificum* Daniell, MULBERRY *Morus* spp., MUSCADINE GRAPE *Vitis rotundifolia* Michx., PASSION FRUIT *Passiflora edulis* / *P. edulis flavicarpa*, PAWPAW *Asimina triloba*, PEPINODULCE

Solanum muricatum Ait., PERSIMMON *Diospyros kaki* Linn, PISTACHIO *Pistacia vera* L., POMEGRANATE *Punica granatum* L., RAISIN TREE *Hovenia dulcis* Thunb., ROSE APPLE *Syzygium jambos* Alston SAPODILLA (Chico) *Manilkara zapota* L., TAMARILLO (Tree tomato) *Cyphomandra betacea* Sent., TAMARIND *Tamarindus indica* L., WHITE SAPOTE *Casimiroa edulis* Llave & Lex, PINYON PINE NUTS, low temperature mangos, and anything else you can think of! Any suggestions gratefully received.

— *John Harrison*, Tasmania

[*Sunday Times* / 1999 Jan 10]

Magnificent mulberries

Although the Shatoot King mulberry has been on sale in Perth for some years, last spring was a golden opportunity to taste the fruit straight from the tree. And what a sensation it was. The flavour was of fresh apricot and there was such sweetness that the fruit must have been dripping with sugar.

Fruits are long, about 10 cm, and cream to yellow in colour. Shatoot mulberry originates in Afghanistan. It is amazingly tough, just like a fellow countryman, the pomegranate.

Being deciduous it can be used to give cooling, dense shade through the warm months of the year before letting the winter sun shine through.

The fruits have so much natural sugar that

they can be dried without: any preservatives.

This allows you to keep eating this delicious fruit outside of the six to eight-week cropping season.

Perhaps the best news for mums, however, is that the fruits are non-staining. This means the kids can eat all they like without overloading the washing machine.

It also means that Shatoot could be used to shade the car without making a mess of the driveway.

Last spring I also tasted a new red-fruited form of Shatoot. This has to be the sweetest fruit ever. At present it has two drawbacks. First, it is difficult to buy, and second, it will stain the paving.

— *Neville Passmore*



Shatoot mulberries ready to eat.

More on plant import restrictions

The last WANATCA general meeting (with a presentation by Mark Stuart, a government quarantine spokesman) gave no indication of any softening of the State Government's draconian restrictions on introducing new plants to WA. Efforts continue, and comments and suggestions continue to be solicited. This matter is too important to let slide.

Letter from Rob Furneaux

A few notes on 'weeds' after reading *Quandong* [First Quarter 1999]. Paul Recher [Fruit Spirit Nursery] is talking in August on the same problem, and we have had many a long discussion.

The 'Authorities' seem to mix up 'Naturalized' and 'Invasive'. They see all as INVASIVE.

Coffee, Olives, indeed Citrus freely naturalize in various parts of the country and would now be prohibited. I cannot import seed into NSW unless WA says it is not a weed.

Rhodomyrtus tomentosa is freely available from nurseries in Queensland. A woman (customer of mine) with a nursery in Tasmania imports (rather, used to import) perennials. Many of which, already here, are no longer allowed in because WA says they are potential weeds.

Victoria is making noises about prohibiting propagation of *Crataegus* species [hawthorn family fruits]. *Salix* [Willows] are all now prohibited, including alpines that take 10 years to cover 30 cm of ground as a prostrate ground cover.

The lists and frustrations are endless. Talk to Paul about importing Ethnobotanical seeds from Botanical Gardens — it will make your gastric juices work overtime.

— **Rob Furneaux**, Kanangra Propagators, PO Box 19B, Douglas Park NSW 2569 <A3092>

Letter to Monty House

To: Monty House, Minister for Primary Industry, 221 St Georges Terrace, Floor 20, Perth, WA 6000

Dear Mr House,

The Weed Disaster

You may wonder why your name should be reviled by a plant nursery owner in Tasmania.

I have to bring to your notice an insidious instance of out-of-control bureaucracy which bodes very poorly for the long-term future of horticultural industries in this State and elsewhere. I refer to an enormously pervasive apparatus which, over the last five years or so, has placed increasing and often unreasonable burdens on the introduction and development of new plant species, in particular species of tree crops.

These species are the very ones which form the basis of the 'sunrise industries' on which most of our long-term futures depend. It is pertinent to comment that of the plants which go to make up the foundations of agriculture in this State, every single one originated outside it. Now, on the fearful grounds of a possible weed explosion, a control apparatus has arisen which is devastating normal commerce in the new plant industry area.

It can be seen how this situation has arisen. With increasing interstate and international movement of horticultural produce, there has

been a natural and generally justified increase in concern about quarantine measures to eliminate introduction of, as far as possible, (a) plant diseases; (b) insect pests. What appears to have happened is that categorizing logic has quietly added to these categories, (c) weeds.

The situation with weeds is totally different to that with diseases or pests, and cannot reasonably be handled by a similar apparatus of exclusion. Every plant species is somewhere part of a natural ecology, where it cannot be classed as a weed. If a weed is 'a plant in the wrong place', what makes it a weed is that someone, somewhere, does not want it, rather than some property of the plant itself.

The really serious change here has been the alteration of official oversight from a 'Restricted List' to a 'Permitted List'. It doesn't seem much different, does it, but in practice it means that an importer of seeds of a new fruit for possible introduction now has to fight a huge government apparatus to do so, and is expected to produce evidence of its harmlessness without any opportunity to carry out trials to produce the required evidence! Goodbye innovation, goodbye all those potential new plant industries....

In a recent instance, a fruiting plant which was to have been grown in Perth was refused entry from the Eastern States (where it is freely on sale) because it had been classed as a weed in Hawaii. The response of the APB when questioned on this logic was that they had no control over where the plant might be taken, and it could be taken north where it might become a weed! This is the sort of reasoning which advises you not to get out of bed in the morning, it would be perfectly within the bounds of possibility that you might break your leg. What no-one seems willing to

face up to is whether the sort of 'control' which has crept in is needed, or wanted, or in the long-term interests of our State.

The Tree Crops Centre and the WA Nut & Tree Crop Association has had considerable interaction with WA government bodies on this matter, and its representatives, such as Mark Stuart, have been pleasant and informative. But there has been no-one in government who is placed to look at the bigger, longer-term position. Can you help here?

David Noël

Director, Tree Crops Centre

PS. The nursery owner in Tasmania used to import seeds of perennial plants, most of which have been grown routinely in Australia for years. Now she is no longer allowed to import them (into Australia) because WA has classed the plants as potential weeds.

The Government's response

**Office of the Chief Executive,
Agriculture Western Australia
3 Baron-Hay Court, South Perth,
Western Australia 6151.**

**Telephone: (08) 9368 3494 Facsimile:
(08) 9368 1205**

16 April 1999

Dear Mr Noel

The Minister for Primary Industry has asked me to provide a reply to your letter of 18 February regarding Western Australia's plant import assessment procedures.

The adoption of the 'permitted list' approach was in response to a number of cases where plant species had been introduced

into Western Australia which were later found to have significant weed potential to both agriculture and environmental resources.

In 1997, the Agriculture Protection Board (APB) was asked to review the adequacy of legislation covering plant imports. The Board took account of the need to balance genetic gain from new species with the risk to agriculture and the environment. Following industry consultation, the APB recommended adoption of the permitted list approach under which plant species cannot enter Western Australia unless their potential weediness had been assessed and was found to be acceptable.

The Weed Risk Assessment system used by Western Australia has been accepted by other Australian States and is also used by the Australian Quarantine and Inspection Service for assessing overseas imports. The system predicts the plant's potential weed status in Australia.

Factors which lead to a high weed risk assessment score include: any history as a weed in other countries; if the species near relatives have a history of weediness; or if the species occupies an aquatic habitat.

On the other hand, a long history of domestic cultivation would indicate a low

"The Government Knows Best"

WAQIS - DOC - 2

DECLARATION 2

DECLARATION TO ACCOMPANY PLANTS, CUTTINGS, BUDWOOD AND BULBS SENT TO WESTERN AUSTRALIA

Company name - Diggers Club

I, KAY STOTT declare the following:
(printed name)

I am aware that only plants listed under Schedule 5 (Permitted Plants list) of Western Australia's Plant Diseases Regulations 1989 are allowed entry into Western Australia.

I have examined Schedule 5 of the Plant Diseases Regulations 1989 and declare that the plants accompanying this declaration are permitted entry into Western Australia.

Kay Stott
Signed

23 APR 1999
Date -

weed potential. The economic impact or potential of the species is also considered in the final decision.

All species are subject to review whether they are on the permitted list or not. Should new or previously unconsidered information come to light that impacts on the plant's weed/ economic potential, a formal review is undertaken. In addition, in my position as Chief Executive Officer of Agriculture Western Australia, I can grant approval and stipulate conditions for the importation from interstate of a species not on the permitted list.

The Australian Quarantine and Inspection Service (AQIS) is responsible for imports of material from overseas. Therefore, the Tasmanian nursery you mentioned in your letter needs to contact AQIS to determine why the plant not on Western Australia's permitted list has been prohibited entry into the rest of Australia.

Regarding species that your members may wish to import that are not on the permitted list, it is suggested that you forward any request for a review to Mr Rob Delane, Executive Director, Agriculture Protection, Agriculture Western Australia, 3 Baron-Hay Court, South Perth 6151.

Yours sincerely

G.A. Robertson, Chief Executive Officer

*The most useful service we
can render a culture is to add a
new plant to its agriculture*

— Thomas Jefferson

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CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: Jul 20

1999

- May 18 Tue **General Meeting (Kellie-Jane Pritchard - Growing Bush Foods in WA - Where are we at?)**
- Jul 4-11 **§International Olive School & Symposium, New Norcia**
- Aug 17 Tue **General Meeting (?Charles Peaty)**
- Aug 14 ***Boyup Brook Agroforestry Field Day**
- Aug 24-26 ***Dowerin Field Days**
- Aug 26-29 **§Australian Olive Association Conference, Mandurah**
- Aug 28-29 **§Australian Quandong Industry Association Conference, Port Augusta**
- Sep 3 Fri ***Karragullen Horticultural Field Day**
- Sep 12 Sun **WANATCA Bring & Buy/ Tree Crops Fair**
- Nov 16 Tue **General Meeting**

*General Meetings are held starting at 7.30pm. *Venue: Theatre Room, Kings Park HQ, West Perth.* These meetings usually include a current magazine display.

• Event with WANATCA participation; § For contact details refer to the Tree Crops Centre.

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

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