

Quandong

magazine of the

West Australian Nut & Tree Crop Association (Inc)

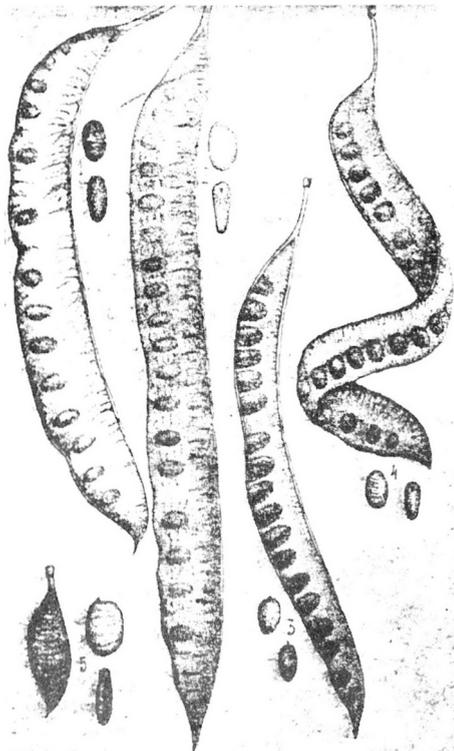
Third Quarter 1990

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Seeds and Fruits of Honey Locust relatives:

1. *Gleditsia sinensis* x *triacanthos*;
2. *G. triacanthos inermis*;
3. *G. triacanthos*;
4. *G. caspica*;
5. *G. aquatica*.



From: *Introduktsiya i ekologiya rastenii* (Ashkhabad, 1968)

Next Meeting:**WINNING THE WAR AGAINST FRUIT FLY**

Our speaker at the next WANATCA meeting will be **Jim Scott** of the Department of Agriculture, who will be talking to us about the continuing struggle against fruit fly attacks in WA.

Fruit Fly was first detected in this State in 1897, at the now Perth suburb of Guildford. This outbreak was of the Mediterranean Fruitfly, native to Africa and perhaps other areas of the Mediterranean. How it got here is not known.

In spite of all efforts, it is still here. Various baiting and spraying schemes were put into force over the years, some official ones under the control of local councils or the D of A, others being private schemes set up with local resources.

Up to the late 1960's it was necessary for households in Perth with even one fruit tree to register themselves as orchards, and pay a small fee towards baiting schemes. The virtual impossibility of getting complete coverage with these schemes was responsible for them lapsing.

Even so, in areas which are to some extent isolated from other fruit trees, as in some of our country towns, control was reasonably effective. Today there are still 55 or such schemes in existence in WA.

A new approach was undertaken around 1982 at Carnarvon. This town is an ideal test site, as it is very isolated, and yet has a thriving fruit production industry (dependent on pumping from the Gascoyne River or its bed). The Department developed fruit fly breeding and sterilization expertise and released immense numbers of sterile male Mediterranean fruit flies over a period of months. The mating of these with fertile females did not produce viable eggs, and enough were released to 'swamp' the wild males.

The exercise seemed to work, and fruit fly seemed to be eliminated in Carnarvon. However, in time re-infection occurred, presumably from infected fruit brought in by visitors. Then in 1989, an outbreak of a species new to WA, the Queensland Fruit Fly, was discovered in the inner Perth suburb of Dalkeith. This species attacked far more types of fruit than the Medfly.

Jim Scott is the Operations Manager of the Queensland Fruit Fly Eradication Programme, and will be recounting the details of the massive effort and millions of dollars put into this scheme. He has been working with fruitfly since 1954, and will be able to put us in the picture on the progress of the War Against Fruit Fly.

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

Time: Wednesday August 15, 7.30 pm

Place: Naturalists Hall, 63 Meriwa Street, Nedlands

WANATCA at the Royal Show

September 29 - October 7

Once again your Association will be represented at the Royal Show, following our very successful debut at the 1989 Show last October.

This year our stand will be in the WA Horticultural Council (WA Gardener) Building. Once again we are indebted to Alex Hart for overseeing our arrangements.

This is the one occasion each year when we call on all members who possibly can to spare a few hours of their time to help us put on a good effort.

Please look at your schedules to see if you can help, during a morning, afternoon, or evening, weekday or weekend, and if you can please contact Alex Hart now on 490 1324 (if Alex is unavailable, contact David Noel on 385 3400).

WANATCA R & D Partnerships off to good start

The R & D Partnership scheme described in the last issue of *Quandong* has really taken off. As well as the original project, a further four were approved at the last Executive Committee meeting, making the total five so far:-

No.	Operator	Scope of R & D Partnership
1	Otto Dik	Introduction of Chilean Fruits and Nuts
2	Matt Bruekers	Improvement & Breeding of Useful Acacia Species
3	Colin McQueen	Exploitation of Yeheb Nut (<i>Cordeauxia edulis</i>) from Ethiopia
4	Bill Napier	Tree Fodder in Yabbie Aquaculture
5	David Noel	Inducing Early Fruiting in Unusual Exotics with Growth Regulators

All the participants are being provided with official Association R & D Partnership letterheads to assist in contacting outside organizations.

An application has been made to a funding source for a block grant to help run the scheme, but the result of this is not yet known.

Full details of the scheme to date will be

found in the Second Quarter 1990 *Quandong*. Further applications and enquiries are very welcome.

Alex Hart has agreed to keep track of approved Partnerships for the Association; preliminary enquiries and suggestions should be directed to David Noel at the Tree Crops Centre.

[Growing Today (NZTCA), April 1990]

NARANJILLA: FAVOURITE FRUIT OF THE ANDES

The Naranjilla, botanically known as *Solanum quitoense*, belongs to the same family as the potato, tomato and tamarillo. It is one of those exotic fruits one hears about but rarely encounter in this country.

To those who know this fruit they are generally well liked, although a first encounter with the fruit may lead to disappointment, as the fruit tends to be very acid or almost bitter when eaten before maturity.

Like so many "new" exotic fruits the Naranjilla is native to the mountainous regions of Ecuador and Colombia in South America. Wild forms of the Naranjilla are found in mountain forests from 1200 to 2000 m altitude in the Andes. The plant itself can be immediately recognised by its spectacular large velvety, purple veined leaves.

The plant is multistemmed, the stems being pale green and spiny and reaching a height of about 2 m. The round orange golfball sized fruits are carried on short stalks on the stem. The green unripe fruits are covered in dense fine hair which rubs off easily when the fruit matures. The Naranjilla plant is a perennial usually lasting about five years under favourable conditions.

Naranjilla is a Spanish word meaning "little orange". The fruit does somewhat resemble an orange in shape and colour, but there the resemblance stops. The skin is



A Naranjilla in full production on Dick Endt's farm.

thin but leathery. The juicy pulp has the consistency of tomato pulp, moss green in colour embedded with flaky seeds.

Our experience is to wait to harvest the fruit until they fall off, usually between the months of October to December. Often the fruit splits open when they ripen. At this stage the fruit is in optimum condition for consumption. The colouration of the fruit from green to yellow orange takes place several months before

maturity. During this stage the fruit is too immature to eat, although by appearance alone one would be tempted to eat it.

The fruit of the Naranjilla is most popular in Ecuador where it is used widely — commonly made into juice, used in sorbets, and made into ice cream. The juice may be diluted and sugar added to make a very refreshing drink of unique flavour. Although not commercially exploited on a large scale, Naranjilla can be bought at most market places in South American towns and cities.

The Naranjilla has been tried in many countries of the world without a great deal of success. The plant has exacting climate requirements. It does not tolerate frosts nor temperatures above 28° C. It prefers humid constant temperatures between 10 to 25° C throughout the year. These conditions are hard to find, and New Zealand can only partly satisfy these requirements.

Our winters are too cool for the Naranjilla, yet the plant survives our climate. During the winter months the plant is set back, losing most of its leaves. Greatest tree losses occur during the cold months as root rot diseases and various stem rots take their toll. Surviving plants are either genetically stronger or a superior microclimate helps in their survival through winter.

The Naranjilla was first introduced in this country in 1956 by Dr. Harold Mouat of DSIR. Plants were grown at the Mount Albert Research centre and some were sent to Kerikeri orchardists. Nothing has ever been reported about what became of these trees.

The writer introduced some Naranjilla seeds in 1968 from Costa Rica. These plants produced fruit and continued to survive for about three years, with the exception of one plant which has survived to this day. The



The juicy pulp is moss green in colour

longevity of the latter is probably due to its growing site, semi shade under an old Puriri tree. Subsequently seeds have been imported by different people over a number of years. No one seems to have yet tackled commercial production of the fruit.

The seed can be extracted from the fruit and sown straight away. Seedlings emerge in about a month and can be pricked out

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when large enough to handle. The plants are difficult to handle in pots or containers as they are very water demanding. Young plants may be lined out in the field when quite small during the late spring.

Growth is rapid. Under favourable conditions flowers and fruitset occurs about six months from planting out. Spacing in the field would need to be 1.8 m each way.

Interplanting with leguminous crops such as beans, alfalfa or the like helps to maintain the ground cover and mulch which the plant requires.

The main problem in growing Naranjilla is the susceptibility of the plant to numerous diseases and pests, in particular Phytophthora rootrot and nematode insects in the roots. Both of these limit the life of the plant.

A well drained soil does help but is no answer in itself. Stem rots caused by bacteria cause die back of the stems. The use of copper based sprays may reduce the problem.

It has been shown that the Naranjilla prefers semi-shade, a soil rich in organic matter with ample moisture during the

summer. During the winter soil should not become waterlogged.

Naranjilla grown under the protection of trees which provide fertile litter, such as the Puriri, but not pine trees, should be ideal for growing in this country.

What does the future hold? Naranjilla can be grown in New Zealand. Some plants have shown that economic results can be achieved. It seems a matter of plant selection to aim for a more disease resistant type of plant.

Over the years it has already been observed that the more spiny type (on leaves and stem) are more resistant to disease than those with smooth leaves. Recent introductions from Ecuador are under trial at the writer's farm.

A sweeter fruit type originally found in the Baeza area in Ecuador is now growing here. Other selections from higher altitudes in the Andes might hold a better future. Hybrid plants of *Solanum quitoense* x *Solanum vestissimum* may result in some interesting fruits.

Growing Naranjilla is one thing. The real challenge will lie in finding a market for the fruit.

— Dick Endt,

Landsend Subtropical Fruits

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Video Review

All About the Bunya Nut

The Bunya, An Australian Nut with Potential. *David Noel.* Tree Crops Centre, 1990. 20 min. Available from Granny Smith's Bookshop — VHS/PAL version (Australia), \$29.95. VHS/NTSC version available (for USA), US\$29.95.

The Bunya Nut (*Araucaria bidwilli*) was so important to the Australian aboriginals that they claimed plant rights over individual trees, and put aside any inter-tribal feuds during the triennial fruiting period. At this time they gathered at the Bunya Mountains in Queensland for a vast festival which has been described as 'an Aboriginal Olympic Games'.

Now WANATCA President David Noel has produced an enthusiastic presentation of the bunya nut story in a very comprehensive and interesting video. Shot mainly in David's backyard (complete with with bird and traffic noises), the video examines fruiting of the bunya, its development from seed, its unique seed propagation and survival techniques, its grafting potential, and tree characteristics.

The extraordinary bunya fruit, a giant pine cone weighing up to 5 kg, is the largest fruit of any temperate climate tree. This cone contains up to 50 or so nuts, slightly larger than chestnuts, tasting like a cross between chestnuts and pinenuts. Each nut is capable of producing a second, underground nut-like tuber which is also edible, tasting of coconut, and has good viability, unlike the original nut.

The bunya and its relatives possess a fascinating geographical and local history. The bunya itself is found mainly in south Queensland, with northern outliers, while its two nut-bearing relatives are from South America. All three species are frost-resistant.

This tree has largely been ignored since European settlement of Australia (except when a cone fell on someone's head), but this video makes it obvious that we should reassess its potential as a viable food source or commercial crop.

— *Bill Napier (& Sue)*

WANTED !!!!!

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[*Pomona (North American Fruit Explorers) 1989*]

THE ASIMINA IN CANADA

In Canada, the *Asimina* (here called pawpaw) is found only in the province of Ontario, only in the extreme southern portion of Ontario bordering the great lakes Huron, Erie and Ontario. It has been designated a rare species but receives no protection under the law.

Because in some areas only 2% of the original forest remains, the number of native stands of pawpaw have accordingly decreased.

Some stands consist of single clones and do not fruit. All populations do, however, appear healthy and are increasing by suckers.

The trees grow as a small understory tree (largest is about nine feet tall) on moist, often alluvial sands and clays. Only the yellow fruited form is known, indicating perhaps dispersal by Indians.

For the past two years the reproductive biology of the pawpaw has been part of a study of rare plants, funded by the World Wildlife Fund. What we have found confirms studies done elsewhere.

First, the pawpaw never self-pollinates. Pollen must come from another clone to cause fruit set. No self-pollinated flower has ever set fruit for us.

Each flower develops in a manner that promotes cross-pollination. The female part of the flower becomes receptive several days before pollen is shed.

Secondly, the pawpaw requires an insect pollinator. Flowers enclosed in mesh bags, which exclude insect-borne but not wind-borne pollen do not set fruit. The most common insect visitors (other than

ants) are beetles and flies. The introduced sap beetle is the most common flying insect found in the flowers. Ants appear to play some role in the pawpaw's life—they are the most common insect found in the flowers and later husband large scales along the stems.

Insect pollinators are inefficient. We found that flowers cross-pollinated by hand achieved a fruit set of 25% as opposed to a natural fruit set of less than 1%.

Of interest is that we did not bag the flowers, and therefore, if insect pollinators were active, they could have increased the natural fruit set. Because this did not happen we think that the Canadian pawpaw lost its natural insect pollinator on the way north.

Under our conditions, seeds germinate very late in the year following dispersal—so late, in fact, that the majority of seedlings winter-kill. This and low fruit production explain the rarity of seedlings in the wild.

In areas where it is common, the wild fruit is gathered, and plants have been brought into cultivation as novelty. To our knowledge, no selection or breeding has been attempted in Canada, but these northern clones may be a good source of hardiness and fruit quality.

— *Gerry Waldron*

RR 3, #16, Amherstburg, Ontario N9V 2Y7, Canada

VETIVER GRASS PROJECT

WANATCA member S.Y. Sin from Malaysia is involved in a project to exploit Vetiver Grass for erosion control in orchards, sand dunes, salt scalds, hill slopes, and highway cuttings.

Vetiver Grass, *Vetiveria zizanioides*, is a clump-growing plant about 1 metre high, similar in appearance to lemon grass.

It is very tough, drought- and salt-resistant, and will put down roots to a metre within one month, and to several metres within a few months, especially in loose or broken soils.

It will grow well in the tropics, yet strains are available with great cold resistance.

At the same time, it does not spread, either from runners or from seed (usual strains are sterile). However, planted closely it will mat together to form a barrier which even snakes and mice are unable to penetrate.

This natural barrier is ideal for retaining soil on rainy hill slopes. The vetiver, if planted along the contour, makes automatic self-terracing; as much as 15 cm of soil has been found piled up behind a vetiver barrier, one month after planting. This is soil which otherwise would have moved downhill.

Vetiver (also called khus-khus) has long been known for its aromatic roots,

which have been used to make fragrant baskets, mats, etc. The white inner parts of the stems are edible.

However, these uses are insignificant compared to the new uses of the plant for erosion control. Two booklets on Vetiver have been issued, one by the World Bank, and copies of these are being obtained by Granny Smith's Bookshop.

Research interests associated with Mr Sin have developed a method for rapid propagation of Vetiver. Australia has 5 native species of *Vetiveria*, the common one and four others which are endemic.

The Tree Crops Centre is attempting to obtain live samples of these for propagation experiments in conjunction with Mr Sin, and for trials in erosion control.

More news later . . .

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Tree Crops Centre active at Perth Zoo

The Perth Zoo recently completed an imaginative new project to create a completely new and attractive Children's section.

Called Harmony Farm, the section is set up like a farm yard, with rural-style farm buildings, typical farm animals (which the children can pat), a small dam and windmill, and small paddocks with hardy windbreak and animal fodder trees.

The dam is arranged so that visitors can pass underneath part of it to view, perhaps, freshwater fish and crayfish which might be grown in a dam.

The entrance is through a simulated 'farm workshop', with snakes crawling over a workbench! There is also an ant's nest (viewed from below-ground level) and a honey-bee hive.

The farm 'homestead' has a permaculture-style kitchen garden installed by Miles Durand.

Outside is a simulated orchard, with conventional temperate fruits and nuts (apple, almond, chestnut, pecan, black walnut, peach), and the whole area has been planted with various subtropical and warm temperate specimen trees (macadamia, loquat, guava, fig, mango, mulberry, lilly pilli, casimiroa, date, avocado, banana, many citrus) which could be expected to grow and produce in a 'farm' setting.

Most of the 'orchard' trees were chosen and planted by David Noel of the Tree Crops Centre. In addition, a 'TCC Compost Stack', a composting technique specially suited to smaller-scale tree cropping ventures, was installed. This technique is described in the article which follows.

In a related move, WANATCA is pleased to welcome Perth Zoo to membership of the Association.

The Zoo already has quite a number of less usual fruiting trees (including two pygmy coconuts, and a lot of kei apples in the African exhibit), and their chief horticulturist, John Hickman, is a fount of knowledge.

If members are interested we could ask the Zoo management if we could stage a Field Day there to see some of their exotic crop trees — it's a beautiful setting!

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*Wholesale Prices (20+ trees).

THE TCC COMPOST STACK

The TCC Compost Stack, developed in Perth by the Tree Crops Centre, represents a new approach to composting.

Its main features are:

- *It uses tree prunings and clippings as its basic material*
- *It is a low-cost, low-hassle system, recycling garden material without adding outside materials such as manure. No turning is needed*
- *It produces large quantities of an excellent tree-crops compost, releasing nutrient over a period of years*
- *It does not smell or attract flies*
- *It takes up little space (a 2 metre square for an average garden)*

To build a TCC stack, the site is split into 4 quarters (1 square metre each), and a square stack is built on one quarter using alternate layers of course prunings (cuttable by hand secateurs) and garden soil. The sides of the stack are laid first, filling in the centre later, so a depression exists in the centre to catch rain. The first quarter-stack may be 1-1.5 metres high, second and later stacks are built in turn against previous ones and may be 2 metres or more in height.

Material is drawn from the oldest stack by cutting off a vertical slice as needed; it matures in 6-18 months, depending on conditions. A shovel and a wheelbarrow are the only two tools needed. In planting a new tree, shrub, or garden bed, two or three barrowloads of soil are removed from the planting site and dumped close to the stacks for use as convenient. This soil is replaced by the same number of barrowloads of the matured compost, just as it is. It really makes trees grow.

The outer 20-cm edges of each stack, not in contact with other quarters, only partially break down. Uncomposted material is just added to the current stack as the matured material is drawn on.

Material needing a chain saw or pruning shears to cut is stacked separately to dry for firewood and kindling.

Tree Crops Centre

PO Box 27, Subiaco, WA 6008

THE BUSH TUCKER REVOLUTION

Book Reviews and Comments

by David Noel

The last twenty years have seen a revolution in the way Australians view the edibility and usefulness of their native flora.

Before 1970, interest in our native food plants was more or less restricted to anthropologists working with the aboriginals. There were some notable exceptions many years previously, with the outstanding botanists Baron Ferdinand von Mueller and Joseph Henry Maiden, each of whom published excellent books in the area (see list at end). Both these books were published in the last century.

Commercial agriculture (and horticulture) in Australia during the first half of the present century was mostly based on the adoption and adaption of European and North American crops and methods. Perhaps it would not be unfair to comment that agriculture was no different to other areas of human activity — after the decline of the interest in the unusual which marked Queen Victoria's era, a rather boring ethos prevailed in which mass production, uniformity, and standardization was the rule. Any colour you like, as long as it is black.

The only Australian-origin plant which had been commercialized was the macadamia, although that was not done here, but in Hawaii. Bananas and sugarcane were established, and that was about the extent of our 'tropical' fruits.

In 1974, the year that the WA Nut & Tree Crop Association was founded, there came the first harbinger of a new attitude to

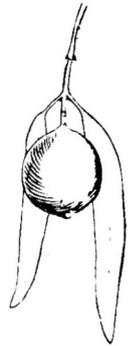
what we now recognize as incredible biological wealth. There must have been something in the air then! For 1974 was the year that A B & J W Cribb published their book *Wild Food in Australia*, a book which has perhaps had the most profound influence on later events, riding as it did on the New Wave of interest in indigenous foods.

The Cribbs' interesting, informative, comprehensive, and even amusing book —

particularly in its account of their use of their children to test for poisons in the foods — was followed in

subsequent years by two related books, *Wild Medicine in Australia* and *Useful Wild Plants in Australia*. These latter two books have the same virtues as the first. A second, revised and enlarged, edition of *Wild Food in Australia* was published in 1987. All these books, appearing in standard paperback format, are excellent value for money.

The Cribbs' work, although drawing on published accounts where they existed, was very much derived from their own tests and



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trials, rather than relying on accounts of what the aboriginals did. The next major step was the publication of Jennifer Isaacs book *Bush Food: aboriginal food and herbal medicine*, in 1987.

Isaacs' book was quite different to the Cribbs, perhaps reflecting the growing respectability of interest in indigenous foods. The word 'bush' appears in the title for the first time. The book itself invokes the description 'coffee-table' book; it is a lavish, large-format hardbound book, beautifully designed and illustrated with a profusion of excellent colour photographs. When it first appeared, I thought the price startlingly high, but these days it is run-of-the-mill.

This book also has quite a difference emphasis to the Cribbs', mostly concentrating on what the aboriginals eat and ate when living 'off the bush'. It is the work of an anthropologist (whereas the Cribbs are botanists). There is

also an emphasis on the plants of northern Australia — which is fair enough, since no aboriginals are living routinely 'off the bush' any more in the south. An excellent, readable work with scholarly undertones.

In the following year, 1988, Tim Low published his book *Wild Food Plants of Australia*. By this time, the Bush Tucker Revolution was in full swing, and definitely 'in'. A botanist, Low had established a reputation as an authority on native foods with his title *Wild Herbs of Australia and New Zealand* in 1985.

Low's *Wild Food Plants* sits between the Cribb and the Isaacs titles. A medium-size hardback, dearer than Cribb but not as expensive as Isaacs, it is a very useful and well-presented compilation. The only one of the three to deal exclusively with plants (the others include some animal foods), it is also the most systematic and scientific. For example, it includes distribution maps for the 150 species covered (a very useful feature for anyone



Kangaroo Apple

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interested in commercializing these foods — it allows seed provenances to be estimated, to yield possible varieties with such things as cold or drought resistance).

By 1989, things were coming thick and fast. The Australian Broadcasting Corporation produced the television series *Bush Tucker Man*, featuring Major Les Hiddens of the Australian Army. This series is now available on videocassette (see list), and is excellent value for its information and entertainment value.

Tim Low came back with *Bush Tucker: Australia's Wild Food Harvest*, another lavish, large-format book with perhaps more appeal to the general reader than his earlier book. Horses for courses, perhaps. By now the gradual linguistic transformation from 'Australian Wild Food' to 'Bush Tucker' was complete, and the subject was acceptable in 'polite society'!

The latest entrant, one indicative of the trend, is *The Bush Food Handbook: how to gather, grow, process & cook Australian wild foods*, by Vic Cherikoff and Jennifer Isaacs. We know Isaacs' background; Vic Cherikoff may, with no unkind intention in these turbulent times, be described as an entrepreneur. Scientifically trained, he now enthusiastically promotes the use of indigenous Australian foods with his Bush Tucker Supply company.

Cherikoff & Isaacs have produced another lavish coffee-table book (again, not

unkindly meant), which is good value at the price. It differs from the other books in its considerable emphasis on the production and use of these foods by ordinary Australians — for example, there are many recipes included, and some mention of growing and processing techniques. A useful feature is the tables of bush foods to be found in particular localities.

Elsewhere in Australasia

Away from the Australian mainland, good work was underway in the same direction. The earliest in the current era (von Mueller's work also extended beyond Australia) is probably *Food Plants of the South Sea Islands*. This was written by Emile Massal and Jacques Barrau and published by the South Pacific Commission as a Technical Paper in 1956 (happily it is still available).

A thin-looking 51-page booklet with a paper cover, this densely-printed work is actually a real mine of invaluable information, containing more solid information than some of the 'coffee-table' books. In the South Seas, agriculture was highly developed, in its own way, well before the days of white colonization, and the book reflects this.

On to New Zealand, where in 1981 Andrew Crowe published *A Field Guide to the Native Edible Plants of New Zealand (including those plants eaten by the Maori)*. This book is comparable to the Cribb one, although it has distribution maps like the 1988 Low book, and can afford to be more comprehensive than either, as there are fewer edible native plants (160 are mentioned) over New Zealand's much

USEFUL TREE SEEDS FROM CHILE

Good range of seeds of fruits, nuts, and other useful trees from Chile.
Many should be suited to Western Australia.

Contact **Jan Correa** for list at:

Casilla 53027, Correo Central, Santiago 1, Chile

smaller area.

Finally we have *Kaikai Aniani: A Guide to the Bush Foods, Markets, and Culinary Arts of Papua New Guinea*, published in 1984 by R J May. This book is a real treasure. Beautifully produced, a medium-sized hardback very reasonably priced, it is almost a forerunner of Cherikoff in the way it gives recipes and growing practices, and has overtones of Isaacs in its exposure of the indigenous inhabitants' practices.

Even more than in the South Seas, the inhabitants of Papua New Guinea developed their own brand of agriculture to a high degree, perhaps hundreds of years before comparable development in Europe. And the interesting thing is that this culture is still very well preserved. Add to this the fact that many of the crops described are almost unknown outside the area, with a number of fruits and nuts crying out for greater exploitation, and the unique value of this book can be appreciated.

Summary

It would be a hard task indeed if one were forced to choose only one or two out of those detailed above as being better than the rest. In my view, every one of them would reach at least the 'very good' classification, most being 'excellent'. And for what each of them tries to be, it is good value for money.

It is unusual not to be able to point out drawbacks in at least some of a range, but there it is. In the list that follows, arranged alphabetically by title, only summary details are given for those detailed above. Other titles in the list are briefly annotated — many of these are also first-class for what they are.

References

Bush Food: aboriginal food and herbal medicine. Jennifer Isaacs. Weldons,

1987. 256p. Hb. \$45.00.

The Bush Food Handbook: how to gather, grow, process & cook Australian wild foods. Vic Cherikoff & Jennifer Isaacs. Ti Tree Press, 1989. 208p., Hb. \$39.95.

Bush Tucker: Australia's Wild Food Harvest. Tim Low. Angus & Robertson, 1989. 23p. Hb. \$45.00

Bush Tucker Man, featuring Major Les Hiddens. ABC-TV videocassettes, VHS/PAL. 2 vols, each 120 mins, \$34.95 each. Vol.1, Arhem Land to Kimberleys; Vol.2, Rainforests to Cape York.

A Field Guide to the Native Edible Plants of New Zealand (including those plants eaten by the Maori). Andrew Crowe. Collins NZ, 1981. 193p. Bds. Availability being checked.

Food Plants of the South Sea Islands. Emile Massal & Jacques Barrau. South Pacific Commission, 1956. 51p. Pb. \$16.95.

Food Potential of Seeds from Australian Native Plants. Ed. Gwyn Jones. Deakin Univ Press, 1985. 212p. Pb. \$22.45. Proceedings of a symposium.

Kaikai Aniani: A Guide to the Bush Foods, Markets, and Culinary Arts of Papua New Guinea. R J May. Robert Brown & Associates, 1984. 192p. Hb. \$29.95

Lesser-Known Australian Nut Plants. David Noel. Pp 9-25 in West Australian Nutgrowing Society Yearbook, Vol. 6, 1980. \$5.00 (whole handbook).

Mayi, Some Bush Fruits of Dampierland. Merrilee Lands. Magabala Books, 1987. 60p. Pb. \$9.95. Good local book covering the Broome area of WA, from the aboriginal publishers.

Ornamental Rainforest Plants in Australia. David L Jones. Reed Books, 1986.

- 364p. Hb. \$29.95. Superb book, mentions hundreds of edible species, gives horticultural tips.
- Select Extra-tropical Plants readily eligible for industrial culture or naturalization.* **Ferdinand von Mueller.** NSW Govt. Printer, 1881. 404p. O/p, but reprint expected from R*O*D Books, around \$42.00. A classic work, various editions produced.
- The Useful Native Plants of Australia.* **Joseph Maiden.** Trubner & Co, 1889. 696p. O/p, but reprint expected from R*O*D Books, around \$76.00. Extremely comprehensive source.
- Useful Wild Plants in Australia.* **A B & J W Cribb.** Collins, 1982. 269p. Pb. \$19.95. Deals with non-food plants for oils, dyes, gums, honey etc.
- Wild Food in Australia.* 2nd ed. **A B & J W Cribb.** Collins, 1987. 284p. Pb. \$19.95.
- Wild Food Plants of Australia.* **Tim Low.** Angus & Robertson, 1988. 236p. Hb. \$39.95.
- Wild Herbs of Australia and New Zealand.* **Tim Low.** Angus & Robertson, 1985. 160p., Pb. Out of Print.
- Wild Medicine in Australia.* **A B & J W Cribb.** Collins, 1983. 228p. Pb. \$16.95.
-
- Where prices are given, items are currently available at these prices from **Granny Smith's Bookshop, PO Box 27, Subiaco, WA 6008.** Prices subject to alteration.

ACOTANC-90 APPROACHING

Australasia's premier Tree Crops event, ACOTANC-90, the 5th Australasian Conference On Tree And Nut Crops, is approaching.

To be held in Berri, South Australia (in the Riverland, the Murray valley close to the Victorian and New South Wales borders), ACOTANC is THE place to meet people who matter in the Tree Crops field, and to listen and talk to experts in many subjects.

Main sessions are from Monday to Friday, September 10-14. Day registrations are possible, and there is plenty of cheap accommodation available at the conference site.

The programme includes sessions on almond, pistachio, walnut, chestnut, hazelnut, pecan, macadamia, cashew, bush tucker, persimmon, nashi, table grape, avocado, irrigation & salinity, computers in horticulture, agroforestry, feijoa, guava, carob, date, jujube, olive, quandong, casimiroa, loquat, pomegranate, fig, jojoba

It's not too late to make up your mind to go. All details available from Bruce Lockier, Conference Director, 6 Frederick St, Cavan SA 5094, Phone 08-349 4556, Fax 08-349 5316.

LETTER FROM THE PILBARA

If only just, the Pilbara and myself are still here, and thanks to David Noel's mention in Quandong and his reminder note, I've managed to crawl out from underneath my Bundi and write . . .

THAT the Neem is alive and well in Wickham. If memory serves me correctly I received 14 seeds. All took. Seven trees were planted in Wickham townsite, in one of the worst possible positions, in the middle of a carpark.

Now 3-4 metres tall, they are on a trickle line (sometimes working), and have never seen a pair of secateurs. Some have straight leaders, others not. One of these days I'll crawl out of the air-conditioned vehicle and have a closer look. But they are doing okay. The others — 4 went to houses around town, and at last passing were doing well, due to their better position, watering in a garden situation etc. A couple went out in the bush (Survival of the fittest), much slower in growth but still green when last seen. One went to Northampton, it had its top broken off to fit into the vehicle, if it keeps growing the way it is I might have to move the house.

For the past nine months I've been

involved with a seedling programme 'The Greening of Wickham' — 10,000 seedlings was the plan, to be planted in June/July, using natives to the area. Everything is growing like mad, mainly acacias, eucalypts, and cassias.

Not much luck with the Desert Walnut, *Owenia reticulata*, or Native Almond, *Terminalia canescens*. I've cracked them in a vice, belted them with a hammer, and soaked them in gibberellic acid. I haven't given up yet though, next I'll add termites to the soil mix — well that's the way they propagate themselves out in the bush!

The figs, guavas, etc. that I originally planted three years ago are still managing to give people breakfast from time to time. While on trickle, they still have to put up with the odd cyclone, not to mention the heat.

So how's all the other Neems around the country doing? A friend in Perth who's a bit keen on tree crops once said "If you can practise horticulture in the Pilbara you can practise it anywhere", well, we are trying — trying — tryi. . . — ing . . . — ng . . . — . . .

— *Ken Herivel*, PO Box 270,
Wickham WA 6720

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[West Australian, November 25 1989]

TREE PROJECT FOR THE GOOD OIL

Murdoch University research technician James Hunter keeps one eye on his job in the trees and one on the ground — watching for snakes.

“Keep an eye out,” he said during an inspection of a trial plot at Murdoch this week. “There are quite a few around here.”

Mr Hunter is involved in a research, development and demonstration project that could be the basis of a new industry for WA.

The project involves the collection of oil from eucalyptus trees, and also aims to help control soil salinity.

Despite the number of eucalyptus trees in Australia, the nation imports more eucalyptus oil than it produces.

The Australian Special Rural Research fund has provided \$42,175 for 1989-90 of \$134,000 sought over three years for the work.

The Men of the Trees group — a non-profit society formed to promote increased tree planting — is helping to plant the Cartmeticup catchment north of Katanning with high oil-yielding eucalypts.

Murdoch University associate professor Allan Barton said yesterday that it was one of several plots around the state planted in the search for trees that would produce best.

Many farmers were keen to co-operate in the scheme as a means of halting the spread of salinity caused by the removal of the original tree cover.

Professor Barton estimated total world production at 3000 tonnes with the oil worth



James Hunter savours the aromas at a eucalyptus trial plot at Murdoch

\$10 a kilogram. It was used for pharmaceutical products and had the potential to be used as a fuel blender.

— *Michael Zekulich*

What the Macadamia Plantation Advert Said (and Didn't Say)

An interesting advertisement in the January 1990 issue of the Australian Macadamia Society News Bulletin gave some details of a macadamia plantation offered for sale.

A summary of the figures: "257 acres with 17,400 macadamia trees, 3-9 years old, a mix of 'the 6 preferred varieties'. All trees irrigated with under-tree sprinklers fed by 4 large dams and a permanent creek.

Property is 18 km from Gympie in Queensland. Asking price of \$2.5 million includes older house, 3 sheds, and approx \$100,000 of equipment.

In 1989, 38 tonnes of macadamias were produced and returned \$130,000. The Queensland Deptmt of Primary Industry estimates that within 5 years the plantation will produce over 260 t/yr, returning in excess of \$783,000/yr".

What can we derive from these figures?

With arithmetic: entire property covers very close to 100 ha. Macadamias might be planted anything from 10 x 5 m (a typical

density), equal to 200 trees/ha, up to (exceptionally dense) 5 x 3 m (660 trees/ha). Assume 250 trees/ha average, the above 17,400 trees would cover 70 ha out of the total (reasonable).

The 1989 yield of 38 t represents 0.54 t/ha over 70 ha; the projected 1994-5 yield of 260 t represents 3.71 t/ha. The 1989 return of \$130,000 represents \$3.42/kg, the projected 5-year return represents \$3.01/kg. Yields per tree are 2.18 kg in 1989 and 14.9 kg projected. All these figures are reasonable.

Perhaps the most interesting derivation concerns the cost of the property. Of course, asking is not getting, but even so \$2.5 million represents \$25,000/ha gross, or \$35,000/ha if all the value was in 70 ha of trees.

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These values are probably at least 10 times the cost of undeveloped land (if it were available). They suggest a value per tree, in ground, 3-9 years on, of at least \$100. Conversely, they suggest that if suitable development project land can be obtained for \$2,500/ha (\$10/tree, at 250 trees/ha), and a tree can be brought to the above producing condition for under \$90, a profit could be made from the development.

The more the cost of tree establishment is below \$90 each, and to a lesser extent the more the land cost is below \$2500/ha, the greater the profit — assuming macadamia prices are maintained.

From the Macadamia Action Group

Macadamias at Bridgetown

Just a short note to inform you that we are planting 100 macadamia trees this year on our property at Bridgetown [Ed: cold apple country].

This may be of use in the future as knowledge regarding their range of suitable growing areas.

— *P & R Davies*, PO Box 14,
Bridgetown WA 6255

[West Australian, January 17 1987]

A LOW-FAT NUT WITH MANY USES

The tasty chestnut is an unusual member of the nut family because it has little protein, contains only traces of oil and has a high percentage of carbohydrate.

As such it's a low-fat food, and the only nut recommended in diets such as the Pritikin. Its increasing popularity is not only attributed to its low calories, but to the interest of Greek, Spanish and Italian migrants.

The chestnut has many uses. It can be eaten fresh or roasted; dried and ground into flour which is then used in soups and confectionery; boiled instead of potatoes; and baked and turned into stuffing for poultry.

When added to cakes it makes them moist and improves their keeping qualities.

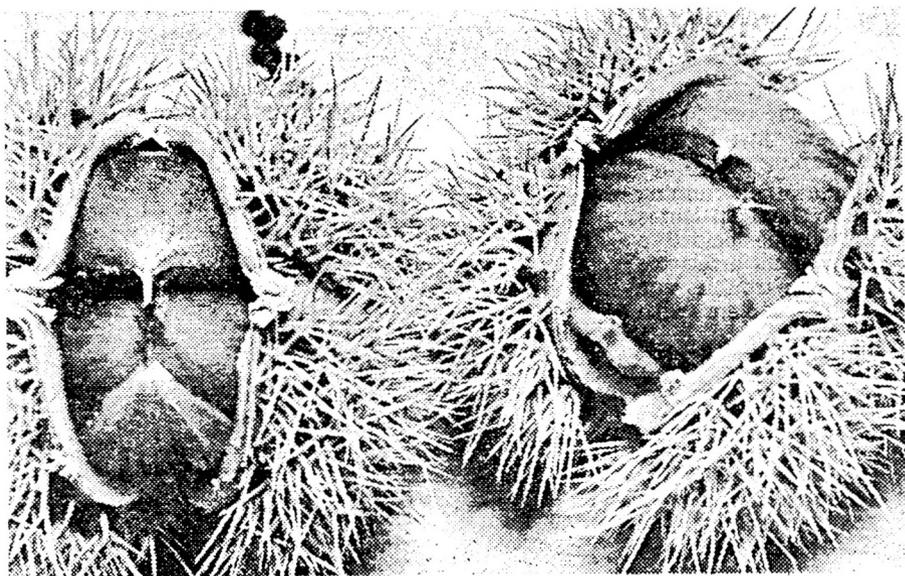
A simple recipe that is ideal for introducing chestnuts into the family diet is

to cover fresh chestnuts with water and boil them for an hour. Drain and peel the nuts, then cut right through the centre of each one and sprinkle with salt and butter. This makes a delicious and filling meal.

Another factor that has led to interest in growing chestnuts is the tale of \$1000 worth of nuts coming from one tree. A mature tree can produce 100-150 kilos of nuts, whereas big old trees have been known to produce in excess of 300 kilos.

Castanea sativa is the botanical name of the European, or Spanish, chestnut as it is known. These are big forest trees and are related to the beech.

The chestnut tree is not for every backyard.



Chestnuts in their spiny husks

It is a big and spreading specimen, sometimes reaching 20 metres in height with an equal spread. It is a very showy and attractive tree — with handsome foliage and small white flowers in clusters. It is able to withstand hard frosts and the flowers are rich in nectar, making it very popular with honey bees.

GROWING NEEDS:

Chestnuts appreciate shelter from hot winds, and while they have a moderate

chilling requirement — that is a need to experience either light frosts or fairly low temperatures through the winter months — they will grow in the Perth area.

Free-draining soil is essential and they will grow in sand or gravel soils. However, growth and productivity will be improved in rich, deep loams.

The geographical area that is best suited to them in WA runs from the inland region

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round Eneabba through to Esperance.

However, it is recommended that you avoid planting chestnuts in near-coastal areas. Chestnuts will not tolerate limey soils and the micro-climate near the coast tends to be a bit too warm and adversely affects cropping.

POLLINATION:

While chestnuts have both male and female flowers, usually round November and December, not all trees are self-fertile.

It is recommended that two trees be planted in the same hole and a multi-stemmed style of tree be cultivated.

The nuts can be harvested in autumn and early winter. It is recommended that the ground beneath the tree be cleaned. Usually the whole nut — including the burr-surround — falls to the ground.

However, some varieties drop the nut and leave the burr on the tree.

The burrs contain very sharp spines and gloves are needed to handle them. It is easier to remove a nut from the burr if it is slightly moistened.

Nuts should only be washed if dirt has gathered on them and they should be rapidly dried out in a shaded spot.

STORAGE:

All storage methods require that the nut is removed from the burr. Because of their high starch and water content, chestnuts tend to deteriorate very quickly without treatment.

They can be soaked in water for a few days (it is important to renew the water

daily) then dried and stored in ventilated plastic bags at room temperature for short periods of time up to a month. During this time the starch in the nuts turns to sugar and the nuts become sweeter.

Another method is to store the nuts in perforated polythene bags in the fridge. A third alternative is to cut the nut, place it in boiling water for a few minutes then peel the skin while the nut is still hot. Nut meat treated in this way can be frozen for long periods of time.

VARIETIES:

The development of varieties is still in its infancy in Australia. Some recent work has been done in Victoria and NSW, and now some WA varieties are becoming available for planting.

As with most nuts and cultivated fruits, grafted trees are far superior to seedling varieties. They will produce crops in two to three years, whereas seedlings can take between four and 10 years for the initial crop. The cultivated nuts are bigger with generally superior flavours and keeping qualities.

PESTS:

In WA there appear to be relatively few pests of chestnuts. We are fortunate because some lethal diseases such as chestnut blight, which has virtually eliminated chestnut growing in the United States, has not entered Australia as a result of our effective quarantine barriers.

While the chestnut isn't for every garden, it is an asset for those who can afford the space and have a suitable climate.

— *Neville Passmore*

New Organic Horticulture Action Group

Bob Davidson Takes on ORGAG

Member Bob Davidson has agreed to take on the leadership of our newest Action Group, the first devoted to a particular approach rather than a particular crop.

Growers interested in the production of fruits and nuts using natural methods which avoid the use of pesticides, or those seeking to obtain the premium prices which this sort of produce can attract, should get in touch with Bob.

Produce is sold through Bob's company Organic & Biodynamic Fresh Pty Ltd at Market City, Canning Vale 6155 (Phone 455 2166), and literature and information (including the *Organic Fresh Newsletter*) are available from the Organic Fresh Information Centre, PO Box 6155, Canning Vale 6155 (Phone 455 2199).

Bob's after-hours phone number is 09-295 4411. If you are interested in 'organic' methods (and who isn't, when they work?), he can help you and you can help him.

SOURCEBOOK NOW BEING COMPILED

Compilation is underway for WANATCA's new publication, the *Australasian Tree Crops Sourcebook*. Input is needed urgently from all readers who wish to make sure that they are correctly represented in the *Commercial Sources* section.

Entries in this section are free, for anyone offering a commercial service to tree croppers — not only suppliers of trees and seeds, but also suppliers of orchard and nursery equipment, orchard chemicals, fertilizers, and of course tree planting, information, soil analysis, and consultancy services and so on.

Entries will cover the whole of Australasia, including New Zealand and Papua New Guinea, and in some categories (eg seed supplies) will be world-wide.

Display advertisements, ranging from \$15 for 1/16 page (A5 pages, as the *Yearbook*), are also very welcome. Services associated with members of WANATCA will have the names highlighted in bold print in the standard directory, where these names are known. In addition, members can claim \$15 off the cost of a display advertisement — in effect, they can have a small display ad free of charge.

Please contact the Sourcebook Section at the Tree Crops Centre for inclusion of your entry. The best way is to send a fax to 09-383 1612. Artwork to PO Box 27, Subiaco WA 6008. Act now!

West Australian Nut & Tree Crop Association (Inc)

PO Box 565 Subiaco WA 6008 Australia

EXECUTIVE COMMITTEE 1990

David Noel (President)	385 3400(W)	381 7341(H)	Amos Machlin	444 4609
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Lorna Budd (Secretary-Treasurer)	458 5918		Alex Sheppard	451 3144(W);
David Turner (Yearbook Editor)	380 2415(W)	387 6057(H)		446 2316(H)
Don Findlay	362 5744(W)	458 2468(H)	Neville Shorter	450 5606
Alex Hart	490 1324			

ACTION GROUP LEADERS

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

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

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

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

ORGANICS: Bob Davidson, 4552199/W, 295 4411/H (PO Box 6155, Canning Vale 6155)

PECAN: Amos Machlin, 444 4609 (38 Hartwell St, Mt Lawley 6050)

PISTACHIO: Tom Bateman, 401 8138 (4 Lygnern Cres. Kallaroo 6025)

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

CALENDAR OF FORTHCOMING EVENTS

1990

Aug 15 Wed *General Meeting (Winning the War against Fruitfly — Jim Scott)

Aug 29-30 §Dowerin Machinery Field Day, Dowerin

Sep 9-14 §ACOTANC-90: 5th Australasian Conference on Tree and Nut Crops, Berri, South Australia
Sep 29-Oct 7 ROYAL SHOW, Perth (see notice p.3)

Oct 16 Tue Executive Committee Meeting (Moved from Oct 9)

Nov 21 Wed *Annual General Meeting (John Bussell — Integrating Tree Crops with Farming)

1991

Feb 3-5 §International Garden Centre Conference, Perth

Feb 22 Wed *General Meeting (Wally Edgecombe — Growing fruits & nuts in northern WA)

*General Meetings are held at the Naturalists Hall, 63 Meriwa Street, Nedlands, starting at 7.30pm.

These meetings usually include a current magazine display.

§ For contact details refer to the Tree Crops Centre

Current Subscription Rate: \$35.00 per year
(includes all publications for the year). Student Rate: \$17.50

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