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Quandong

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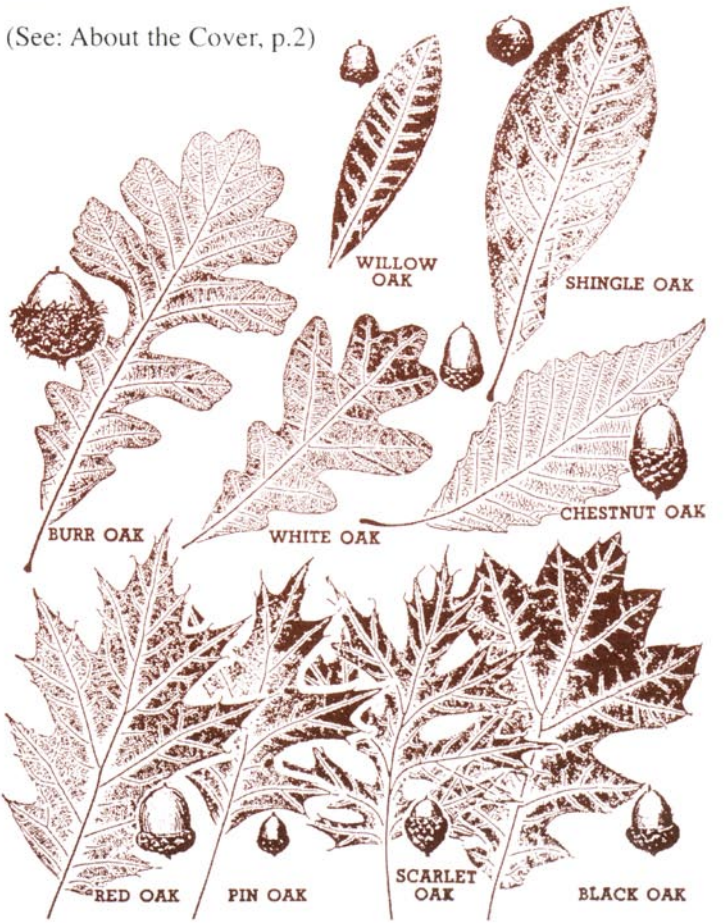
Oaks, *Quercus spp.*

(See: About the Cover, p.2)



DON'T MISS THE NEXT WANATCA GENERAL MEETING:
7:30 pm, Tuesday August 23, 2005

At our next meeting Peter Coyne, Project Co-ordinator of Agritech Smartwater, will speak on two related subjects:

Salinity - Australia's Cancerous Scourge
and
Water - Our most Precious Resource

Agritech has two plans in place for the correction of salt-affected land in our wheatbelt and the provision of huge quantities of water to negate our current water crisis. These projects offer to correct vast tracts of our valuable agricultural land, restore our rivers, streams and lakes, and as a consequence produce cold, green, renewable energy plus large amounts of potable water for current and future needs.

This meeting is at Kings Park Headquarters as usual. It's a unique opportunity to find out more about this vital topic.

Late enquiries to 9250 1888 please.

In This Issue

About the Cover

The cover drawings are of oak leaves and acorns from *Scout Field Book* by James E. West amd William Hillcourt. See also pages 15 - 19 in this issue of *Quandong*.

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.

Marula Tips

These notes were taken at the last WANATCA meeting. Rob Harington spoke about his experiences in growing Marula trees, and passed along some information about improving the success rate in germinating Marula seeds.

Our speaker, Rob Harington, was born virtually in the shade of a Marula tree in South Africa, and is now enthusiastically pursuing the development of Marula as a tree crop in Western Australia.

Marulas can grow to be large trees. In the wilds of Africa, trees are usually single-stemmed with no low foliage - this is because they are pruned by animals. Rob finds that when protected from animals that chew on them, multiple stems occur. Trees damaged by frost or animals will re-shoot. The roots of Marula trees are very fat and juicy; water can be drained from them in desert emergencies. Trees are semi-deciduous. In colder areas, leaves drop in August. A few weeks later, stems of small flowers appear.

Marulas are dioecious, that is, male and female flowers occur on separate trees. Rob's large tree has proved to be a male. He has a crop of new, young marula trees growing now, so hopes to produce some fruit in the next few years.

The fruit is golf ball size, with a tough yellow skin, a layer of fibrous, white flesh, and a large, tough, irregular seed which is very hard to crack. There is great variation in the flavours of the fruits and also the kernels from different trees. More than 140 flavour compounds have been identified in Marula flesh, and 250 flavours in the nuts. The nuts contain 28% protein and 60% oil, and the fruit has 4 times more Vitamin C than citrus.

A few people have been specially selecting seed from good-flavoured fruits, but general seed suppliers simply collect their seeds from cattle dung.

Marula seeds have a reputation for being difficult to germinate. Passage through the digestive system of an animal doesn't help. Rob has worked out a method that gives him better than 100% germination. The reason it is more than 100% is that each seed can contain 2, 3, or 4 embryos. The seed is not polyembryonic - each seedling is a distinct individual.

First, Rob cleans the seed, scouring the dried, fibrous flesh from the hard shell with a small electric wirebrush wheel. Then, the 'caps' become visible. These are close-fitting covers over each embryo.Rob carefully

Quandong links to ATCROS

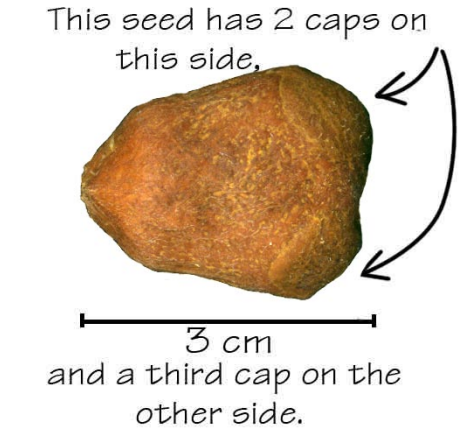
Many of the articles, advertisements, and news items in Quandong refer to organizations and people who are listed in the Directory section of the ATCROS Web Site, which is at:

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>.



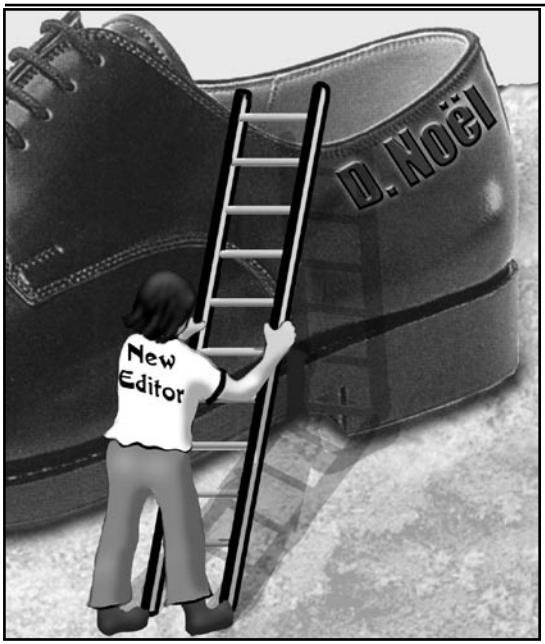
loosens each cap with a small screwdriver that has been ground down a little. If you want to try to extract the kernel for sampling, you can take the cap off - it looks like a little plug, and you can see the pale kernel inside the hole. But be warned - it is very difficult to extract the kernel. Africans have the secret of doing this, but so far, Rob doesn't.

If you want the seed to germinate, don't take the cap off completely: just loosen it a little. Bury the whole seeds in good potting mix and keep moist and warm. Only start the seeds in warm weather, unless you can provide bottom heat. Young plants are vulnerable to frost.

Seedlings transplant well. They like a firm soil such as red loam. Deep ripping is beneficial, and they respond to fertiliser. Cuttings are easy to grow, and there have been reports of using very large cuttings, called 'truncheons.' * The Israelis have been raising Marulas in the Negev desert, and have produced useful information about required conditions.#

*See article called 'Large Cuttings' on page 6.

#See story in WANATCA Yearbook 1994 pg 42: 'Rare and Wild Fruit and Nut Trees for Desert Areas,' by Nerd, Aronson & Mizrahi.



New editor at helm of Quandong

This issue of Quandong was edited by Pat Scott with the assistance of retiring editor, David Noël.

It is appropriate at this time of change-over to ask you, the members of WANATCA, if there are any changes to Quandong that you would like to see, for example, different ways of presenting material or new features. Members' letters and stories of experiences are welcome! Now is your chance to have your say!

Post letters to the editor to:

PO Box 565, Subiaco, WA, 6008

Or e-mail to:

quandong@iinet.net.au

[Western Suburbs Weekly, 24 May 05]

Slick operation

Jutta Ganz gives us the good oil on the family's olive plantation

THE Jumanga Olive Grove, Carabooda, is just one of the many thriving cottage businesses along the newly created tourist and heritage drive, off Old Yanchep Road.

Owners Jutta and Manfred Ganz said the idea to plant an olive grove on their property was born in 2001 after their son Thomas graduated from UWA with a Bachelor of Science in Horticulture.

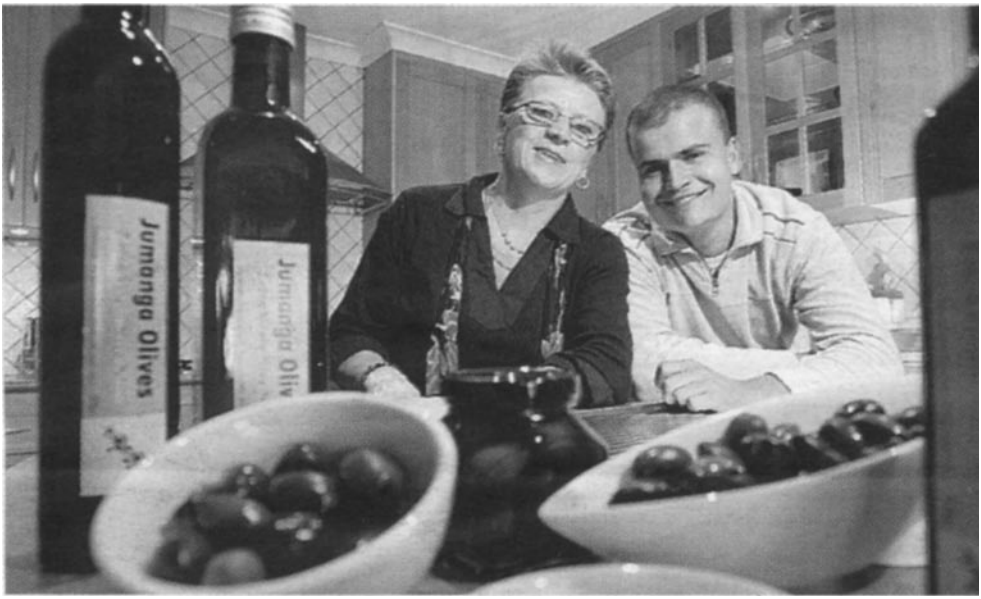
"His first class honours and a scholarship and encouragement from olive guru Professor Stan Kailis enabled Thomas to do a PhD in olive oil quality for the south-western region of WA," Mrs Ganz said.

"He suggested that we plant an olive grove here and we all loved the idea and the whole family is involved now.

Mrs Ganz said the trees at Jumanga were planted five years ago and were organically grown to keep in balance with the ecosystem to ensure high-class extra virgin olive oil for health- conscious people.

The olive tree plantation occupies about 4ha of the 9ha property and an olive mill has just been installed. Mrs Ganz said the mill allowed selective processing of olive varieties for optimum quality and for storing the oils separately for further blending. She said the olive grove would have a shop with tasting facilities by the end of the year.

---by adriana tsovleas
---picture matthew poon



Jutta and Thomas Ganz at Jumanga Olive Grove with some of their produce.

[The Permaculture Edge, Vol. 3 Issue 3, 1993]

Large Cuttings

A jump start for tree planting

Here is a useful method for getting a head start in growing certain trees. It is particularly valuable for creating windbreaks, living fences and hedges quickly. There are strong suggestions that Marula can be added to the list of species that can be grown this way and white sapote, *Casimiroa edulis*, also comes to mind as a possible candidate for this method. Note that dates are for the northern hemisphere.

In Costa Rica, as in other tropical countries, the forests are being cut down and burned to create pastures and cropland. Deforestation is proceeding at an alarming rate -600 square kilometres are lost every year in this one small country. Of Costa Rica's original forest resources of 35,000 square kilometres, only half remains. Clearly, in this situation a technique that facilitates tree planting is of considerable value.

Chorotega is on the Nicoya Peninsula in the northwestern part of Costa Rica. Here, farmers use a traditional technique to establish living fences from large cuttings. The technique offers potential for farmers in many other parts of the world.

The method

In March, two months before the planting season for crops, farmers look for well-developed trees with large shoots that grow straight up from lateral branches. They select three-year-old vertical shoots about 15 centimetres in diameter. These are cut at the base, right where the shoot grows out of the 'mother' branch.

The farmers trim these shoots to a length of 2.5 metres and lay them out horizontally in the shade under the tree. Here they remain for one week. The farmers then stack them vertically against the base of the tree for three weeks, keeping the lower ends at the bottom. They plant them in April, four weeks after they were cut, burying the lower ends to a depth of 50 centimetres. The planting technique requires a minimum of soil preparation.

Horticulturists call these vertical branches apicormic shoots', 'crown suckers' or 'reiterations'. They develop readily into mature trees because they are not normal branches. Rather, they originate from special buds that possess the entire morphogenetic potential of the species. In other words, an apicormic shoot is 'a tree within a tree'.

The special buds may or may not actually develop into shoots, depending on environmental conditions. Development can also be stimulated by management interventions such as pruning. Coffee farmers, for example, tie the main stem of plants into an arch to stimulate the growth of vertical shoots in large numbers. These are then cut and used to produce new coffee trees by vegetative propagation. By contrast, a cutting from a normal, horizontal branch would produce a creeping coffee plant.

In Chorotega, more than 80% of shoots planted in this way become established and grow to mature trees. Eight years after planting, a large shoot of *Bombacopsis quinata* can develop into a tree 20 metres tall with a stem 55 centimetres in diameter at breast height.

Resting the shoots for one week on the ground probably allows the cuts at both ends to heal. Stacking them vertically for another three weeks may encourage minerals and

hormones to concentrate at the bottom end. And the four-week rest period may strengthen the bark. When other farmers tried planting the shoots as soon as they were cut, they dried out, lost their bark and died. By contrast, after four weeks' rest, many shoots have already begun to develop roots.

Altogether, only 30 minutes of labour are required per tree planted, and this comes at an ideal time for farmers -two months before the normal planting season for crops. The only other cost is wear to the farmers' traditional hand tools - the machete and the axe.

The simplicity of this method, its low cost, and its exceptional success rate all indicate an exciting potential for wider dissemination to small-scale farmers throughout the tropics. Trees established from these large shoots yield products of commercial value in only 7 to 10 years. Preliminary calculations from northwestern Costa Rica indicate that *B. quinata* planted from apicormic shoots on gently sloping land with good drainage and soils 60 centimetres deep gives an internal rate of return of 15%.

Broader applications

The farmers in Chorotega use this method to establish living fences around pastures. For this purpose, they prefer two local tree species - *B. quinata* and *Bursera simaruba*. Once living fences are established, their prunings provide fuelwood to the farm family. This is an important consideration in a country where households in densely populated, deforested areas spend up to 15% of family income on fuelwood.

Living fence of Erythrina *species at Turrialba, Costa Rica*

Farmers in the central valley of Costa Rica use apicormic shoots to establish *Erythrina herteroana* trees to shade coffee plants. To produce fuelwood and fodder, Costa Rican farmers plant *Gliricidia sepium*, *Leucaena leucocephala*, *Cassia grandis* and *E. herteroana* from shoots.

They also use this technique to plant valuable timber trees such as teak (*Tectona grandis*) and Eucalyptus species.

Because the shoots are already 2 metres tall when they are planted, they do not require as much protection from browsing livestock as ordinary seedlings. For this reason, the technique could be particularly useful for establishing trees in pastures. Trees also grow well from apicormic shoots interplanted with banana and papaya, providing the farmer with extra income from the wood. Interplanted with vegetables, the shoots serve as stakes for climbing beans. Because of rapid growth and maturation, farmers could profitably grow trees from shoots to produce seed on a commercial basis.

We have achieved good success establishing simple terraces on eroded slopes and the banks of streams by planting shoots of *G. sepium* at 3-metre intervals across the slope. We placed 5-metre lengths of bamboo and banana leaves upslope from the shoots and in a short time terraces began to fill with earth.

Tree establishment from apicormic shoots holds promise for small reforestation projects. Right from the outset, the large

shoots can hold their own against competition from surrounding grass and bushes. This saves substantially on costs and labour requirements for clearing. The shoots also withstand occasional burning better than small tree seedlings. However, this approach will probably not be appropriate for large-scale reforestation projects or commercial tree plantations because it would be difficult to obtain sufficient quantities of planting material.

During eight years of observation and research, we have met farmers who are establishing trees from apicormic shoots in Latin America, Africa and Asia. Visiting farms throughout the tropics, we have observed the method applied successfully to more than 60 tree species.

With modest assistance, farmers could use this technique for small-scale reforestation projects, especially if they can manage the trees on a profitable and sustainable basis.

The technique could usefully be tested for a variety of applications. We have seen trees established from shoots around football fields in Senegal, Côte d'Ivoire and Togo in West Africa, in the car-park of the national university in Mexico City, and on hazelnut plantations in France.

Further research

The list of species that establish readily from apicormic shoots could certainly be expanded through further on-farm surveys. In particular, the technique might work well with fruit species. In Costa Rica, some farmers are already establishing citrus trees from apicormic shoots.

Observations of tree morphology reveal candidate species. These produce straight shoots that grow vertically from lateral branches. They have the same proportions as young trees grown from seed.

Variations on the technique could also be investigated. We cut shoots from *B. quinata* in May 1984, left them on the ground for four months and planted them in October. They began sprouting in March 1985 and by April some had produced branches 60 centimetres long. Given the availability of labour during the dry season, studies on tree planting techniques at this time of year might be particularly rewarding.

The first author would like to hear from any researchers, development workers or others who have tested such species or observed farmers growing trees from apicormic shoots. In turn, he is ready to collect and distribute such information to other interested individuals or groups.

---Dominique John is a sustainable development specialist based in Santa Maria de Dota, Costa Rica.

---Emmanuel Torquebiau is a forest ecologist with ICRAF.

This article first appeared in 'Agroforestry Today', October-December 1992, reprinted in 'The Permaculture Edge,' October 1993.

Pistachio Nut Trees

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Tree species observed to grow well from large apicormic shoots

Species	Family	Countries Where Observed
Actinus aroborescens	Solanaceae	Costa Rica
Afzelia bijuca	Caesalpiniaceae	Madagascar
Albizia lebbeck, A. stipulata	Leguminosae	Madagascar
Anacardium occidentale	Anacardiaceae	Madagascar
Azadirachta indica	Meliaceae	Senegal, Sudan
Bombacopsis sp.	Bombacaceae	Ecuador
Bombacopsis quinata	Bombacaceae	Costa Rica, Vanuatu
Bursera simaruba	Burseraceae	Costa Rica, Mexico
Cassia grandis	Caesalpiniaceae	Costa Rica, Togo
Castanea sativa	Fagaceae	France
Ceiba pentandra	Bombacaceae	Côte d'Ivoire, Madagascar
Crescentia alata	Bignoniaceae	Costa Rica
Cupressus sp.	Cupressaceae	France
Diphysa robinioides	Leguminosae	Costa Rica
Erythrina sp.	Leguminosae	Ecuador, Costa Rica, Senegal, India
Eucalyptus sp.	Myrtaceae	Costa Rica, Mexico
Fagelia falcata	Leguminosae	Madagascar
Ficus sp.	Moraceae	Senegal, Madagascar
Gliricidia sepium	Leguminosae	Costa Rica, Madagascar
Gmelina arborea	Verbenaceae	Costa Rica
Guazuma ulmifolia	Sterculiaceae	Costa Rica
Lannea acida	Anacardiaceae	Senegal
Leucaena leucocephala	Leguminosae	Costa Rica
Lonchocarpus sp.	Leguminosae	Senegal
Morus alba	Moraceae	France
Ochroma pyramidale	Bombacaceae	Costa Rica
Pentaclethra macroloba	Leguminosae	Costa Rica
Picea excelsa	Pinaceae	France
Platanus sp.	Platanaceae	France
Plumeria rubra	Apocynaceae	Mexico
Populus sp.	Salicaceae	Canada, Costa Rica, France
Prosopis sp.	Leguminosae	Ecuador
Pterocarpus cendragon	Leguminosae	New Caledonia
Robinia pseudoacacia	Leguminosae	France
Salix sp.	Salicaceae	Canada
Spondias mombin, S. purpurea	Anacardiaceae	Peru, Colombia, Ecuador
Syzygium jambos	Myrtaceae	Costa Rica
Tabebuia rosea	Bignonaceae	Costa Rica, Ecuador
Tectona grandis	Verbenaceae	Costa Rica
Tilia cordata	Tiliaceae	France
Yucca elephantipes	Agavaceae	Costa Rica.

'BRING & BUY' MEETING OFFERS CHANCE OF RARE TREES

Once again, WANATCA has organized a 'Bring & Buy/Tree Crops Fair' event, at which members and others can buy and sell all sorts of useful plants, including some real rarities not available anywhere else in WA.

This year the event will again be held in the Carpark of the Captain Stirling Hotel, Stirling Highway, Nedlands. Make a note of the date:

9.30AM. 12.30 PM, SUNDAY, 11 September, 2005

This event is open to all buyers and sellers, including commercial nurseries involved with fruit and nut trees, and especially sister organizations.

Bookings for sellers will cost $5, no charge to buyers. Many thanks to Stanley Parkinson for taking on the organization of this event.

To book your space, please contact Stanley on 9386 2518 (or e-mail: sjparkinson.hotmail.com).

Many thanks to the management of the Captain Stirling Hotel for their generosity in allowing us to use their site. The Hotel offers a fine range of meals and other refreshments -just the way to top off a great morning!

Here is a list of some of the items offered in previous years:

Acacia saligna (Saligna Wattle - Herbert strain): Very variable WA wattle. This strain can grow rapidly to 10 m (4 m in first season), good pioneer, firewood, biomass producer. Dies at age 10-12 years, riddled with borers.

Annona cherimola (Cherimoya) : Cool-climate, deciduous custard-apple relative, will fruit in Perth, one of world's best fruits. Seedling.

Annona x atemoyer (Custard Apple, Atemoya) : For warm-temperate/subtropical climates. Seedling.

Araucaria bidwillii (Bunya Pine): Stately relative of Norfolk Island Pine, slow growth, huge (5 kg) cones with delicious edible nuts like chestnuts, fine timber. Hardy. Australian native nut. Commercial future.

Artocarpus heterophyllus (Jakfruit) : Huge edible fruits, mostly on trunk. "Tropical", but these plants raised in open in Perth.

Carissa grandiflora (Carissa, Natal Plum): Spiny evergreen hedge plant, has plum-like edible fruits.

Casimiroa edulis (Casimiroa, White Sapote) Hardy fruiting tree from Mexico, produces very sweet orange-sized green or yellow fruit, excellent when softened.

Diospyros digyna (Chocolate Pudding Fruit, Black Sapote) : Evergreen persimmon relative, will fruit in Perth, black fruit with chocolate flavour when fully ripe, recommended with ice cream, dairy products.

Diploglottis campbellii (Native Tamarind) Australian rainforest tree, promising bush-food fruit.

Doyalis caffra (K-fruit, Kei Apple) : Spiny tree from South Africa, hardy hedge or barrier plant, bears round yellow plum-sized fruits, unusual acid/sweet flavour with hint of apricot, carrot. Commercial possibility.

Eriobotrya japonica (Loquat): Hardy, evergreen apple relative from China. Fast-growing, sweet yellow-orange fruit in Spring, good biomass, filler tree. Fruits good for jam, drying.

Eugenia uniflora (Pitanga, Surinam Cher-

ry) Evergreen shrub, bears distinctive red cherry-sized ribbed fruit, unusual sweet/sour 2-phase flavour, grow well in Perth. From South America.

Ficus carica 'Peter Good' (Fig) : The best WA- origin fig selection for home use.

Ficus coronata (Sandpaper Fig) : One of the best of the Australian native figs, evergreen, masses of small edible fruits on branches and trunk. Leaves very rough, like sandpaper.

Ginkgo biloba (Ginkgo, Maidenhair Tree): 'Living Fossil' first noted in coal deposits, subsequently found live in China. Slow-growing, deciduous, male and female trees, latter bear edible & medicinal nuts, 'silver almonds'.

Harpephyllum caffrum (Kaffir Plum): Distinctive fast-growing evergreen tree, red sweet fruits with large pip, may have potential as a timber tree. Not for very cold areas.

Hylocereus oncampensis (Red Pitaya) : Unusual climbing cactus, grows on walls or other trees, spectacular night flowers may be followed by beautiful large (1 kg) red-fleshed fruit. Needs some shade and support. Commercial prospects.

Inga mortoniana (Inga, Ice-cream Bean) Subtropical evergreen tree, lush leaves, producer of pods with sweet edible flesh.

Leucaena leucocephala (Leucaena) : Important tropical fodder & timber species. Grows quite well in Perth in sunny position. White ball flowers followed by dark brown pods.

Mangifera indica (Mango): A good versatile fruit for Perth, self-fertile. Seedling, but normally true-to- type.

Manilkara zapota (Sapodilla, Chiku) : Mexican fruit now found worldwide, very sweet fruit like brown sugar, slow growing, will fruit in Perth. Seedling.

Pereskia aculeata (Barbados Gooseberry, Pereskia) Climbing thorny vine, grows easily. Small yellow edible fruit. Has fleshy leaves, is a primitive cactus.

Persea americana (Avocado): Avocado.

Psidium guajave (Guava): Fairly hardy subtropical fruit, pear-size fruits eaten green or allowed to soften & sweeten, high vitamin content, many seeds.

Quercus suber (Cork Oak): The bark is the source of commercial cork, and the acorns are good for stock feed. Slow-growing, evergreen, hardy to frost, quite dry conditions.

Sterculia quadrifida (Peanut Tree) : North Australian kurrajong relative, tree develops distinctive bottle shape, bears pods containing round seeds which when roasted are similar to peanuts.

Syzygium forte (White Apple) : Fairly hardy Australian lillypilly relative, large edible fruit.

Syzygium jambos (Jambo Fruit) Substantial evergreen tree in myrtle family, from Asia but grows well in Perth, has small apple shaped fruit, apricot texture, good flavour.

Syzygium paniculatum (Magenta Brush Cherry, Lilly-Pilly (WA)) : Prolifically- and early-fruiting Australian native, hardy in Perth, small apple-flavour crisp purple fruits.

Ugni molinae (Ugni, Chile guava) : Attractive compact shrub, small tangy fruit, hardy in most conditions.

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[New Scientist, 4 June 2005]

Red Delicious is best disease fighter

Another dimension of apples, which suggests more research is needed and perhaps new marketing tactics developed.

A Red Delicious apple a day keeps the doctor furthest away. This variety contains higher levels of disease-fighting chemicals than some other varieties, a Canadian study has found.

Apples - and especially their skins - are a good source of dietary antioxidants. These help neutralise reactive molecules called free radicals, which have been linked to cancer, Alzheimer's and heart disease. A team led by Ronglsaoof Agriculture and Agri-Food Canada in Guelph, Ontario, measured the antioxidant activity of the skins of eight popular apple varieties. Red Delicious apples had the strongest antioxidant activity, more than six times that of the wimpiest variety, Empire. Ida Red and Cortland varieties took second and third place, well behind Red Delicious. Although the top three apples on Tsao's list were red, he says colour is not a reliable indicator of antioxidant content. The results were to be published in the 29 June issue of the Journal of Agricultural and Food Chemistry.

Red Delicious apples have become less popular in recent years as consumers have sought out other varieties, says Elmer Kidd, director of production for Stark Bro's Nurseries and Orchards of Missouri, which introduced Red Delicious in 1893. "Red Delicious looks good, tastes sweet, and has a long shelf life," he says. "I hope consumers rediscover it."

Food tree anecdotes sought

Barrie Oldfield of The Men of The Trees has an educational mission: he films and produces video projects on topics concerning trees. He calls upon WANATCA members for suggestions.

Do you have any tales to tell about extraordinary trees? Do you know any people who seem to have an ability beyond the normal when it comes to selecting bud wood, picking the one tree out of a thousand that will outperform the rest (and choosing it out of season) or in any other way gifted in the way that Luther Burbank was? Burbank as you will know had remarkable skills as a horticulturist. He was the man responsible for giving us the Santa Rosa Plum, the Burbank Potato, and many hundreds of other food plants we take for granted today. So prolific was he that during his lifetime he averaged one new plant every three weeks – and he lived to the age of 77! Barrie Oldfield is collecting this largely anecdotal information for a possible future video script. Whether it will evolve into anything substantial will depend largely on what Quandong readers can pass on. Barrie's email is salibari@iinet.net.au or you can fax to 9291 6027.

[Darwin Branch RFC of A Newsletter No.5 October, 1991 and Rare Fruit Council of Australia Inc. Jan. 1992]

Four-flap grafting of the Mamey

There are a variety of different grafting methods. Some species of plants are easy to graft by any method, but others will respond well only to certain techniques. The author is writing here specifically about Mamey Sapotes, but points out that this is a good technique for beginners to learn, and this method will certainly work on other species.

Although several grafting techniques have proven successful for experienced grafters of the mamey sapote (*Pouteria sapota*), most amateur plant propagators find the plant difficult to graft.

Four-flap grafting is a technique for grafting pecan (*Carya illinoensis*) which was developed in Oklahoma during the 1970's, as a recommended technique for the beginner. A modification of this process was used to find out its effectiveness with the mamey sapote.

The study was conducted at Fairchild Tropical Garden. The grafting was done by two experienced grafters

Twenty four actively growing containerized mamey sapote seedling rootstocks were obtained from a commercial nursery. The 50-60cm tall seedlings were topped at about. 30cm. Four vertical 7cm slices were made through the bark from the cut end towards the base Fig. 1A).

Juvenile seedling scions 12-14cm in length were collected and prepared by cutting four 6cm flat cuts equally spaced around the base (Fig.1B).

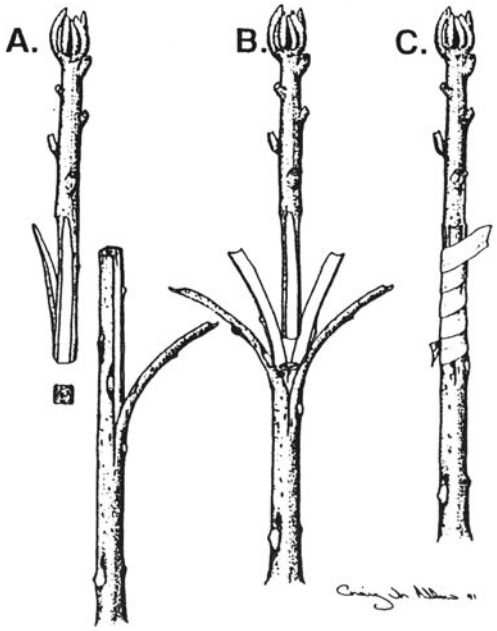

Fig. 1 Illustration of the preparation of scion and rootstock for four-flap grafting.

(A) Four shallow cuts along the base of the scion and the resulting square cross-section (top), and four vertical slices through the bark of the lopped rootstock (bottom).

(B) Prepared pieces following removal of wood from the rootstock.

(C) Joined pieces following wrapping of the union.

These cuts were shallow, removing the bark and a minimal amount of wood. The prepared end of the scion had a square cross-section.

Returning to the rootstock, the four bark flaps made by the vertical slices were peeled away from the wood, starting at the cut end. This process exposed 7cm of wood, which was carefully clipped out while holding the four flaps down (Fig.1B).

The scion was placed on top of the cut end of the rootstock, and the four flaps pulled around it.t Each of the rootstock flaps were easily matched with one of the four cuts on the scion. Cut areas were wrapped with grafting tape (Fig.1C), and the exposed scion covered with parafilm.

Grafted plants were placed on raised benches under glasshouse conditions on 16th December, 1988 and maintained until 5th March, 1989. Mean success rate was 67% for the two grafters. No forcing of scion growth was needed since the technique is a terminal graft, so after care consisted only of removing any rootstock growth below the graft union.

This preliminary study shows that the four-flap technique may be suitable for grafting mamey sapote. Success rate may be enhanced by pre-girdling scion wood and/or cutting off the terminal bud and leaves and waiting for lateral buds to swell. These processes have proven beneficial for other grafting techniques, and may influence success with the four-flap method. The only strict requirement for the four-flap method is an actively-growing rootstock, since the bark must slip freely.

Beginners may obtain a higher success rate with the four-flap technique for several reasons. The cuts are easy to make, and need not be precise, and after care is simple. More importantly, however, a large amount of cambium contact between the scion and rootstock is quite easily obtained without careful fitting of pieces.

---Thomas Marler

Further Reading

Hartmann, H.T. & D.E. Kester, 1975. *Plant propagation, principles and practices*. 3rd ed. pp.314-454. Prentice-Hall, Englewood Cliffs, NJ.

Vanerwegan, Jerry. 1975. A new grafting procedure. *Pecan South* Vol.2 No.2.

Get Set for the Bring & Buy

WANATCA will again be holding a Bring & Buy meeting at the Captain Stirling Hotel carpark, Stirling Highway, Nedlands.

The date is Sunday, September 11
9 am to 12 noon

There is only enough time now to make sure your plants are weeded and looking good.

This is the opportunity to make some money and at the same time raise the number of crop trees planted locally. There is a good chance you will find trees offered for sale here that you will find nowhere else.

Commercial sales are welcome too.

Queries to Stanley Parkinson
08-9386 2518

Q & A

A member asked this question:

I wonder if you could point me to some up-to-date info on using tree crops for producing flour?

David Noël replies:

-- To produce flour (in the normal sense) you need a high-carbohydrate seed or plant part to work with.

Seeds with high oil content are not suitable.

-- The commonest tree seed used to produce flour is the chestnut. According to J Russell Smith's *Tree Crops, a permanent agriculture*, you can get more flour from an acre of chestnuts than from an acre of wheat. In former days, chestnut flour was a staple in the Mediterranean islands, now their flour is from imported wheat or other field crop grain.

-- The only other tree seeds that I can recall as extensively used for flour are acorns (from Quercus), used by the American Indians in former days. Of course in Australia the Aboriginals used wattleseed flour and mush from cycad seeds cleared of poisons in running water for flour. There are other carbohydrate sources, such as sago from sago palm trunks, but these are not usually classed as 'flour'.

Pat Scott adds: I would add carob to this list. Gound carob pods without seeds have about 5% protein and 30-40% sugar, and can replace up to 25% of wheat flour in recipes.

[www.arnatural.org/wildlife/Wildfoods/edible.asp]

Eating Acorns

Oak trees are not terribly common in WA. However, if you happen to come upon some, here is some info about how to use the acorns.

Oaks are usually divided into two distinct groups: 1) the Red Oaks and 2) the White Oaks. Leaf lobes that are angular with a bristle at the tip of the leaf and at each lobe are characteristic of Red Oaks. The leaves of White Oaks may also be lobed but are rounded with no bristles on the tips. The acorns of Red Oaks require 2 growing seasons to mature whereas those of the White Oaks mature in one season. The bark and wood of the Red Oak group is commonly dark while the bark and wood of the White Oak group is light. Although all acorns are edible, white oak acorns are less bitter and are preferred by squirrels, deer, and other wildlife. Native Americans and early settlers preferred White Oak acorns but would eat Red Oak acorns as well. Oak bark was also used for medicinal purposes as a tonic, an antiseptic, and for chronic dysentery.

All acorns contain tannin, an organic chemical that is also found in tea and coffee, and makes the acorns bitter. Tannins can be leached out by boiling the acorns for several hours, changing the water every hour or so. The author boiled red oak acorns for about five changes of water and soaked the boiled acorns overnight. Most of the bitterness from the tannins was successfully removed.

White oak acorns do not require leaching and can be shucked and dried without boiling. The acorns can then be dried and ground into a course meal using a heavy duty grain grinder. The resulting meal is somewhat coarse with a texture similar to corn grits. The meal can be used in standard nut bread and cookie recipes. The author usually substitutes one cup of acorn meal for one cup of flour in a standard banana nut bread recipe.

[http://www.thenutfactory.com/kitchen/edible/facts-oaks.html Oaks]

Species of oaks with edible acorns

Acorns of various species range from miniscule to a mighty 5 cm long. Edibility ranges from excellent to barely edible.

The 450 kinds of acorns that fall from that many different kinds of oaks are highly popular with squirrels and a lot of acorns are eaten by people.

Though it is a common belief that acorns are only fit to feed hogs, many kinds can be made edible and nourishing for people as well. Indians gathered and stored acorns and ground them into meal and baked as an unleavened pastry. The tannin, which causes the bitter taste in raw acorns, was removed by soaking in water and filtering - or by boiling and leaching with ashes.

Chinquapin Oak, *Quercus prinoides*. The chinquapin was a pioneer staple used by the eastern mountain men as a food source and part of the American folklore.

California White Oak, *Q. lobata*. The acorns form a large proportion of the winter food of the Indians of Northern California. There were over 300,000 indians in California when it was discovered by the white man - all subsisting on acorns and other foods.

Emery Oak, *Q. emoryi,* Indians and Mexicans in the southwest eat the sweetish acorns of this tree. The nuts are known by the Spanish name "bellotas - pronounced bay-YOH-tahs.

Holly Oak, *Q. ilex*. Mediterranean region and the orient. The famous Chestnut Oak, *Q. prinus*, is a common tree found in southern France, Spain and Portugal and its nuts are highly prized. The nuts are sold in Palestine bazaars as a roasted kernel. This is perhaps the most edible acorn in the world and is prized by the Mayans.

Truffle Oak, *Q. robur*. This acorn has served mankind well as a famine-food in Europe. The bread made from this nut is detestable, but is said to have been used in famine in large quantities to feed starving populations. During a 1709 famine in France an illness called "trousse galante" followed acorn eating, but people survived and regained their health during the famine.

Some other well-known oaks with edible acorns: Swamp White Oak, *Q. bicolor* or *Q. michauxii*; Post Oak, *Q. stellata*; Burr Oak, *Q. macrocarpa*.

"Sturdy" oaks are famous in poetry and prose. Their timber is renowned for its strength, durability and quality.

[http://aggie-horticulture.tamu.edu/plantanswers/recipes]

How to harvest and eat the abundant acorns

More information about preparing acorns. Once the acorn meal is free of tannins, it can be dried and toasted lightly before use - a wonderful aroma! If you happen to toast the acorns too much, you can brew them with water for a coffee substitute.

Preparing ground acorn meal

Pick up several cupfuls of acorns. All kinds of oaks have edible acorns. Some have more tannin than others, but leaching will remove the tannin from all of them.

Shell the acorns with a nutcracker, a knife, a hammer, or a rock.

Grind them. If you are in the woods, smash them, a few at a time on a hard boulder with a smaller stone, Indian style. Do this until all the acorns are ground into a crumbly paste. If you are at home, it's faster and easier to use the blender. Put the shelled acorns in the blender, fill it up with water, and grind at high speed for a minute or two. You will get a thick, cream-coloured goo. It looks yummy, but tastes terrible.

Leach (wash) them. Line a big sieve with a cloth and pour in the ground acorns. Hold the sieve under a faucet and slowly pour water through, stirring with one hand, for about five minutes. A lot of creamy stuff will come out. This is the tannin. When the water runs clear, stop and taste a little. When the meal is not bitter, you have washed it enough.

Or, in camp, tie the meal up in a towel and swish it in several bucketfuls of clean drinking water, until it passes the taste test.

Squeeze out as much water as you can, with your hands.

Use the ground acorn mash right away, because it turns dark when it is left around. Or store in plastic for freezing if you want to use it later.

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[http://cemarin.ucdavis.edu/index2.html]

Phytophthora strikes again

The genus *Phytophthora* has caused much death and destruction of plants and, indirectly, of humans, through the ages. The deadly potato blight that destroyed potato crops in Ireland in the 18th century and caused the death by starvation of perhaps a million people and the migration of many, was a *Phytophthora. P. cinnamomi*, known as Jarrah dieback, kills many plant species as well as jarrahs. Now there is a new bully on the block - *P. ramorum* - that is devastating oak trees and more than 30 other species in North America and Europe. The pictures below show typical wilting, bleeding and bark cankers of infected trees. Leaves also show characteristic spots.

Since 1995, large numbers of tanoaks (*Lithocarpus densiflorus*), coast live oaks (*Quercus agrifolia*) and black oaks (*Quercus kelloggii*) have been dying in California's coastal counties. The epidemic, referred to as Sudden Oak Death, was first seen on tanoak in Mill Valley (Marin County) in 1995. Since then, it has been confirmed in twelve central coastal counties: Marin, Santa Cruz, Sonoma, Napa, San Mateo, Monterey, Santa Clara, Mendocino, Solano, Alameda, Contra Costa, and Humboldt, as well as in Curry County, Oregon (as of July 2002).

In June 2000, University of California researchers isolated a previously unknown species of *Phytophthora*, a fungus-like organism, from dying trees. Relatives of this "fungus" caused the Irish potato famine, Port-Orford cedar root disease in the Pacific Northwest and are causing oak dieback in many parts of the world. In January, 2001 researchers reported "that a new species of Phytophthora isolated as early as 1993 from ornamental rhododendrons in Germany and The Netherlands matches the newly-discovered species found in California." This new species has since been officially named: *Phytophthora ramorum*. The name refers to the pathogen's tendency to cause infection on branches.

Important research discoveries have continued since then. Notable among them are the findings that *Phytophthora ramorum* may be spread through infected wood, soil and rainwater. The leaves of foliar hosts such as bays, madrones and rhododendrons contain large amounts of spores which may be dispersed through the air under moist and windy conditions. However, probably the most important way in which humans spread the pathogen around is by moving infected plants and plant parts.

Pomegranates

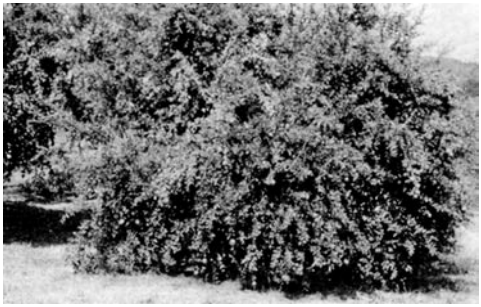
If you like the taste of the fruit, the pomegranate is almost the perfect tree for the West Australian garden. It's really good looking, needs very little care and suffers few problems. What more could you ask!

The name pomegranate comes from the Latin pomum, an apple, and granatum, having many seeds. Botanically it is *Punica granatum*, one of only two members of the genus. There seems to be some confusion about the plant's origins. Various sources quote the Middle East, Asia or southern Europe.

The fact that it has been in cultivation for thousands of years has obscured its natural beginnings. The other member of the genus is found only on an island in the Indian Ocean near the north African coast.

The cultivated pomegranate is found just about everywhere, especially in old gardens. It's not because everybody used to love the fruit. It's more because the plant is easy to propagate and give away to friends or neighbours. It can be grown from the seeds but there is a fair amount of genetic variation from that method. It's much easier to dig up and transplant a sucker which gives a plant identical to its parent.

The pomegranate is a small deciduous tree growing to four or five metres high with an almost equal spread and a slight weeping habit. Most gardeners keep them below this size by regular pruning, to which they respond well.



They can be trained as espalier plants and also make good bonsai specimens.

The leaves are a bright glossy green. Flowers are produced in spring and summer at the ends of the branches. The commonly grown fruiting form, Wonderful, has brilliant orange-red blooms either singly or in small clusters.

There are also dwarf and yellow, white and multicoloured flowering forms. To my knowledge the latter are not available in WA.

The fruits are almost orange-size, reddish yellow when ripe with a pronounced crown on the flower end. They are best left to ripen on the tree and keep for several weeks.

The plants grow well in alkaline, sandy soils and tolerate some salinity. They need watering for the first few years but after that they are drought-tolerant. If you want good

fruit, though they need regular watering over summer to avoid fruit split.

Apart from bird damage and fruit split they have few problems.

As with any fruit which has been in cultivation for a long time, the pomegranate has some mythical powers. In ancient Greece it was associated with fertility. It was the fruit eaten by Persephone which trapped her in the underworld.

It was said that she ate four seeds which gave rise to four barren months in the year. Parts of the fruit were used by the ancient Greeks in fertility potions.

In modern times it has been discovered that the fruit is rich in sterol oestrogens, the female sex hormone. Rather than increasing fertility, it actually suppresses it.

I'm not suggesting modern use for it with humans hut I can tell you that if you feed a guinea pig just 10 grams a day, it will not breed.

[Comment News Community Newspaper, 28 June 2005] **Warning on fire ants**

If you recently bought plants originating from the eastern states, be alert. Gardeners and nursery owners are encouraged to look out for the exotic tropical fire ant after the recent discovery of a nest at a wholesale nursery.

Department of Agriculture entomologist Peter Davis said close co-operation between the industry and department meant the nest was quickly destroyed. However, he said support was needed to ensure the ants had not been transported elsewhere in plant deliveries. The ants are:

• coppery-brown in colour on the head and body, with a darker abdomen.

• Come in a variety of sizes within one nest, ranging from 2mm to 6 mm. This is a distinguishing feature of fire ants.

• Have nests 15 -30 cm high with no obvious entry or exit holes on top of them.

• Can be distinguished by their aggressive behaviour, particularly near the nest.

Call the Pest and Disease Information Service on 1800 084 881.

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[www.wiliamsriverproduce.com.au]

Williams River Produce Open Farm Field Day

"Boraning", Williams, WA on Saturday, 1 October

Seventeen years ago we took over a farm which was a cattle, sheep and cropping operation. We converted to Bio-dynamics straight away, and have been farming using those methods since that time. We also diversified into tree-based agriculture, as it makes sense to recover portions of the land with trees and also to plant trees from which we can derive future income.

We planted commercial orchards of citrus, olives, pistachios, figs, almonds, pecans and a range of other fruit and nut varieties.

We now have a successful broadacre biodynamic organic farm with livestock, some cropping, diversified into tree crops and value-adding citrus, olives and pistachios and other tree crops. We are employing more people and this farm is continuing to grow in health.

Field Day Topics:

- **Biodynamic farming methods** - what is it? Use of preparations to enliven the soil, creating soil structure, natural fertilisers, stock rotations, pasture, crops, cattle, sheep, orchards etc. in bio-dynamic systems. Bob MacIntosh, the most experienced biodynamic farmer in the state and the convenor of the Biodynamic Agricultural Association in WA, will be a guest speaker.
- **Biodynamic/organic orcharding methods**...demonstrations of orchard mowing machinery, irrigation methods and design suitable for organic systems...
- **Focus on diversification**, especially pistachio growing (800 tree orchard), olives (oil and table varieties), almonds, pecans, citrus, figs and other fruit. Bert Hayes, who is probably the most experienced pistachio grower in WA and who has built a processing facility on his farm and travelled the world studying pistachios, will be a guest speaker and will have trees available for sale.
- **Water harvesting**. An opportunity to see a creative system utilising interconnected dams and bores and illustrating the potential ability to water harvest and open up intensive farming options.
- **Gardening** in a biodynamic/organic and creative way.
- **Conservation** and conscious creation of beauty.
- **Value adding** of products - the Newton-Wordsworths through their business, Williams River Produce, produce and market olive oil, olives and marmalade Australia wide and internationally as well as fresh fruit and beef in WA.

Field day commences 10.00 sharp - to approx. 4.00pm. Gather from 9.30 am for a coffee/tea at "The White House", Boraning. Directions- travel 17 kms west of Williams on the Quindanning Rd., proceed to 100 metres west of the big bridge over the Williams River then turn north into farm entrance.

Please phone 9885 1181 - RSVP required so we know numbers and can give further directions. Map can be faxed if requested. Cost $30 per person, $50 family. (BDAA members are half price). BYO lunch to share. Come prepared to walk if you are physically able. Parents please be aware that there is a dam in close proximity to where the field day is centred.

We invite you to our field day.

[The Orchardist, New Zealand, June 2005]

A HortResearch perspective on Arguta

Actinidia arguta has been grown in N.Z, for more than 50 years, but has only been produced on a commercial basis the past 5 years. There are several green varieties, and one red, with others under development. Production has been increasing rapidly, but growers are experiencing some problems. It is a labour-intensive crop which means it needs to sell for a high price and there is tough competition from other countries such as Chile. Kiwiberries are still relatively unknown by consumers, and new markets need to be developed.

Actinidia arguta is the perfect marriage of health and convenience - a bite sized kiwifruit that can be eaten whole! Today's consumers lead busier lifestyles, with a greater consumption of easy to eat and pre-packaged products. There is also a huge focus on healthy foods and this little fruit meets all these requirements.

It is important to appreciate that whilst this product belongs to the kiwifruit family it should be harvested, handled, packaged and eaten as a berryfruit, and, as with berryfruit products, we are dealing with a high value, high health, high convenience product. As this industry is a new one, it will experience growing pains as it learns how to handle and market the product.

A. arguta is a species of kiwifruit that produces small, sweet fruit with edible skins. *A. arguta* is not a new product on the global market - many selections are being produced around the world. Fruit produced in New Zealand is marketed as KiwiBerry. After an intensive program of breeding HortResearch is now in the process of commercialising a new spherical shaped *A. arguta* selection that weighs around 10-14 g.

A. arguta is grown on a vine similarly to other kiwifruit species. One of the main considerations in growing this type of kiwifruit is good wind protection and development of a strong canopy to avoid fruit damage and sunburn. Sufficient warmth is necessary for the accumulation of dry matter in the fruit, giving it optimum taste. Currently in the New Zealand industry there are a lot of young vines, which have relatively low packout rates (-20%) due to the fact the fruit is relatively exposed, however in more established vines sustainable packout rates are being achieved (-80%).

Harvesting is quite different to other kiwifruit, and should be approached as for berryfruit. Like all high value products where image and quality are a prerequisite, *A. arguta* is costly to harvest.

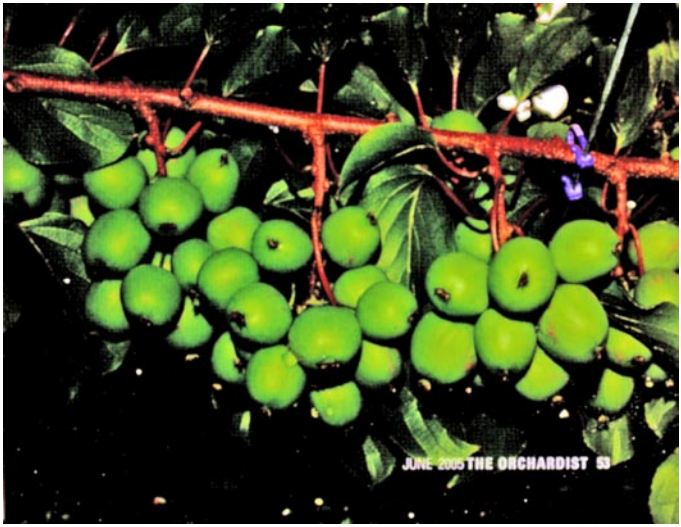
However, as for any commercial product as growers become more familiar with *A. arguta* systems will be developed to minimise costs and maximise quality - it will be the innovative growers that will be successful. One of the major causes of fruit losses at the packhouse is due to soft fruit being stored in modular boxes in coolstores; once the fruit are punneted and any soft and damaged fruit are removed then the storage life of the product can be optimised. Therefore fruit should be graded into punnets within 24 hours to remove fruit that will trigger softening of other fruit due to ethylene production.

Owing to its 'bite' size and hairless, edible skin, the entire fruit can be eaten without a spoon and without a mess, the fruit offers 80 mg Vitamin C per 1OO g fresh weight

fruit, which represents levels similar to other kiwifruit. The novelty factor of the fruit is massive, clearly this product needs to by promoted more as most consumers have never experienced the flavour and sweetness of this small fruit. By establishing a reasonable volume of *A. arguta* in the market-place, both distributors and consumers should become familiar with this product, helping make it a distinctive and readily available fruit. This would be easily achieved by producing this fruit in different countries, or growing it under controlled environment thereby putting fruit into supermarkets all year round, who knows the potential of this little fruit and whether it will become the cherry tomato of the future.

HortResearch's breeding work on Arguta is a long-term project and is being led by Dr Ron Beatson of the Nelson Research Centre. Work has also been done concurrently at HortResearch in Te Puke, as well as replicated trials in the different growing regions.

---Contact: Michelle Williams, Group Leader Quality Systems, HortResearch, mwilliams@hortresearch.co.nz
www.hortresearch.co.nz



Pollinating hardy kiwis

It's amazing what you can find on the World Wide Web. Here is a question and answer from the North American Fruit Explorers. This little snippet reveals that it is possible to pollinate female *A. arguta* flowers with pollen from *A. deliciosa*. There are several vendors of agricultural pollen in the US, but I was not able to locate any commercial source in Australia.

Q. For the 3rd year in a row, it looks like my male *Actinidia arguta* will not do his duty and flower, so I am pollen-less and have several females who will flower. I suppose I could wait another year, but I'm getting impatient. Anyone in Indiana have pollen I could come get? Could someone mail me pollen? Any other thoughts?

A. You can order *A. deliciosa* pollen here, http://www.fennelpollen.com/contact.htm, or at least you could a couple of years ago. It will set arguta fruit just great and it's relatively cheap. The minimum order was 10 grams at $1.60/g. 10 grams is a LOT of pollen.

[http://www.kiwiberry.com/sare%20grant.htm]

The Kiwi SARE Grant

A further sifting through the Internet found a report about the pollination of hardy kiwis (SARE, Sustainable Agriculture Research and Education, a program of the US Department of Agriculture.)

Part of the study was to determine the effectiveness of pollen dispersion achieved by bees introduced into the arbor or mechanical application.

A. deliciosa pollen was purchased from Pollen Collection & Sales in Lodi, California, and The Pollen Bank in Bakersfield, CA., which are the only two sources for this type of pollen in the United States.

Deliciosa kiwi pollen must be stored in a frozen state until use. Pollen that is taken out of frozen containment is only viable for a period of up to three hours.

Three types of pollen were used for mechanical application. All had an 85% viability or better.

Type One - contained a mixture of pollen and anthers. This proved hard to distribute due to the anthers blocking the applicator. This pollen seemed to have the least effect.

Type Two - contained 100% pollen without anthers. This pollen, which provided very satisfactory results, was easily dispersed but would be costly to do large areas with proper coverage.

Type Three - contained 50% pollen, and 50% lycopodium. Lycopodium is a clay material that is used as an extender for pollen. This mixture produced good results, was easily dispersed, and would be the most cost effective to use in a commercial arbor.

It is of importance to note that *A. arguta*, hardy kiwi flowers contain pollen but do not contain nectar. According to apiary sources, honeybees will "work" flowers without nectar if placed in the arbor at a 20% or higher flower bloom.

Hives were observed on a daily basis to document the amount of kiwi pollen carried by the bees. Kiwi pollen can be distinguished from other types of pollen in that it is pure white. The pollen of multi-flora rose is orange for example.

The majority of honeybees lost interest in the kiwi flowers within 24 hours of their introduction into the arbor. A minimal number of bees, out of approximately twenty, were observed carrying pollen back to the

Male flowers of *Actinidia arguta*

Female flowers of *Actinidia arguta*

hive the first day, and one to two bees, out of approximately fifty, the second day.

The *A. deliciosa* pollen, when added to hives or hive porches, seemed to irritate the honeybees and no bees were observed returning with kiwi pollen from the vines.

During flower, which lasted approximately eight days, no more than two honeybees were observed on a female cultivar at one time, yet pollination in the arbor did take place. It was concluded that some wind dispersion had occurred.

Weather conditions also play a major role in the activity of honeybees. The owners of the apiary confirmed that honeybees do not like, and generally will not work well in, overcast conditions.

The results indicate that mechanical pollination provides more consistent results for a variety of female cultivars.

In summary, mechanical pollination also allows the grower "site specific" application to meet his individual pollination needs. Also, this method is more cost effective. It does not require the rental of honeybee hives and the purchase of pollen to be placed in the hives.

Strange growth habits of grafts and buds

Select the material for grafting and budding carefully, as these scions 'remember' what they were doing before they were amputated from their parent plant.

An elderly friend who's been working at identifying and collecting superior timber-type black walnuts across the Southeastern US for 30 years or so, makes the anecdotal observation that for the populations within that species that he's worked with there is a significant problem with 'loss of juvenile traits' - particularly the desirable rapid, upright growth habit - when topworking scions from an older mature tree onto seedling rootstocks. It either requires additional pruning/training to get a good clean bole that would yield a good sawlog or perhaps cutting back multiple times to induce rapid sucker-like growth that may revert back to a more juvenile, vegetative style of growth.

---Lucky

I have spent years explaining to people the importance of NOT planting seedling citrus or grafting from young trees or from low vigorous branches. Such trees grow straight up and exhibit delayed and sparse production. If you bud from mature trees you get nice low spreading trees that kick into production early. So think before you graft, guys, do you want timber or fruit/nut production? Choose your scions carefully.

I have a book which says that old roses (same family as apples) will repeat poorly if budded from a fast growing cane. Buds from an older cane that has bloomed in the past will produce a plant that blooms much better. If you think about it, a whole row of trees of the same variety won't look exactly the same. One volume of THE CITRUS INDUSTRY shows leaves taken from 27 different navel orange trees (in a single grove) in which the whole tree came from a single bud mutation. They stressed the importance of choosing budwood carefully, and avoiding cutting from branches that don't fit the norm.

---Donna

[http://www.echonet.org/eln&herbs/eln_catalog/salttol.htm]

Salt tolerance of fruit trees

Another useful web document about salt tolerance of different fruiting trees. Information adapted from *Rare and Exotic Tropical Fruits: Trees and Plants*, by Carl W. Campbell and Seymour Goldweber and *Florida Fruit* by Lewis S. Maxwell and Betty M. Maxwell.

Good	Moderate	Fair	Poor
Carissa	Akee	Apple	Ambarella
Coconut	Bignay	Atemoya	Avocado
Tamarind	Black Sapote	Acerola	Banana
	Canistel	Cacao	Blueberry
	Cattley Guava	Cherimoya	Star Apple
	Feijoa	Cherry of the Rio Grande	Carambola
	Fig	Citrus (rootstock dependent)	Cashew
	Governor's Plum	Coffee	Jaboticaba
	Guava	Custard Apple	Longan
	Imbe	Grumichama	Lychee
	Indian Jujube	Ilama	Macadamia
	Jackfruit	Kei Apple	Mango
	Jelly Palm	Kumquat	Muscadine Grape
	Key Lime	Kwai Muk	Nectarine
	Loquat	Mamey Sapote	Pawpaw
	Mayan Breadnut	Miracle Fruit	Passionfruit
	Monstera	Mulberry	Peach
	Pomegranate	Persimmon	Pear
	Prickly Pear	Pineapple	Plantain
	Pummelo	Pitomba	Raspberry
	Purple Mombin	Roselle	Strawberry Tree
	Rose Apple	Soursop	
	Sapodilla	Surinam Cherry	
	Spanish Lime	Wampi	
	Mandarines	White sapote	
	Wax Jambu		

For many people, especially those living in coastal areas, or irrigating with well water with high salt content, soil salinity (high amounts of salts in the soil) can really limit home fruit tree growth. Soil salinity can result from a number of different causes, both natural as well as resulting from human activity. Salts (including your common table salt) occur naturally in soils, and are present in all water, except rainwater. Salts build up naturally in soil. Water evaporation, heavy irrigation and chemical fertilizers can increase soil salinity. As well, in coastal areas, the salt spray can wreak havoc on plant leaves.

Salts in soils cause problems by inhibiting the growth of most plants, and killing many. The salts render less water available to plants, because the salt ions attract water. The most common symptom of this are leaf burn and drought stress (even if the plant is well-watered). Often chlorosis (yellowing of the leaves) is another common symptom.

Managing your saline soil: The addition of organic matter (compost, mulch, manure, etc...) will aid in improving your soil over time by providing a buffering effect. It may take a few years to see the results (especially in sandy soils) but it should be worth the effort. Try not to over-fertilize, as that can contribute to the problem. Irrigate regularly, but take care not to over-irrigate. Planting on ridges helps as well.

Living with your saline soil: Try to select trees and plants that are salt-tolerant. This will have the additional benefit of improving your soil and the environment over time as well.

These plants perform well on the high pH, and very salty soil on La Gonave island in Haiti

Common Name	Scientific Name	
Barbados Cherry	*Malpighia glabra*	somewhat salt tolerant
Canistel	*Pouteria campechiana*	tolerates poor soil
Coconut	*Cocos nucifera*	resistant to hot humid and dry weather
Date Palm	*Phoenix dactylus*	
Fig	*Ficus carica*	moderately tolerant
Guava	*Psidium guajava*	tolerates wet and moderately saline soils
Imbe	*Garcinia livingstoneii*	drought tolerant
Indian Jujube	*Ziziphus mauritania*	mild-high salinity, frost hardy, drought tolerant, can be planted on sand
Key Lime	*Citrus aurantifolia*	very cold sensitive
Moringa	*Moringa oleifera*	drought hardy
Neem	*Azadirachta indica*	very hardy on poor soil
Pawpaw	*Carica papaya*	
Sapodilla	*Manilkara zapota*	can irrigate with brackish water
Sour Orange		
Tamarind	*Tamarindus indica*	very salt tolerant, can withstand salt spray

[Comment News Community Newspaper, June 21-27, 2005]

Huge truffle no trifling matter

There are several farms in the Manjimup area where truffles are being grown on the roots of hazelnuts and oaks.

PERTH chef Alain Fabrègues was on hand last week when a large French black truffle was unearthed in Manjimup.

The truffle weighed 1kg and was believed to be the largest ever found in the southern hemisphere.

The subterranean mushroom with its pungent odour was found on Sunday, June 12, by highly-trained dogs at The Wine and Truffle Company's Manjimup trufferie.

Company managing director Wally Edwards said the find was encouraging. "Truffles are highly prized and the demand for them is worldwide," he said. "Depending on the quality, the price of a French black truffle can fetch from $1500 to $3000 a kilogram."

Considered the finest of the edible fungus with its unique taste, and deemed by some connoisseurs an aphrodisiac, the French black truffle's use is limited only by the imagination of the chef.

Mr Fabrègues, who runs the Loose Box restaurant, bought a third of the truffle and said it was the "holy grail" of cuisine. "Truffle goes wonderfully with pasta, risotto, scrambled eggs and mashed potato," he said.

[rarefruit@yahoogroups.com]

Watering pot plants

This suggestion came in response to an on-line discussion about leaf drop and fungal problems with loquats growing in pots.

I had the problem of brown edges on the leaves, especially on the *Theobroma cacao*. What I have found that works well for me is to put the pots in seed starter trays that are about 2 inches deep and fill them with water. I don't water from the top, but let the water "wick up" through the soil. When the tray is dry I just add more water. The benefits to this method are you can tell when the plant actually needs water, it promotes deep root growth, and it adds humidity to the air. I have had success with the ultra tropicals using this method. No more brown edges or leaf loss!

---Stephen Gagnon

[POLEX@CGIAR.ORG, Wed, 25 May 2005]

China reforestry advances

China has been seriously deforested for many years, and suffers all the resulting evils of soil erosion, massive dust clouds, and drying of the climate. Fortunately, the government has recognised the problem and is taking steps to ameliorate it. This report is from The Center for International Forestry Research (CIFOR).

Big bucks for the environment – China leads the way.

You hear a lot of talk these days about paying people to protect the environment. Most of it is just that - talk. China is putting its money where its mouth is. Since 1999 they've paid farmers over $40 billion dollars to convert hilly and unproductive crop land to forest.

The Sloping Land Conversion Program, also known as 'Grain for Green', is supposed to increase total forest area by almost 10% by 2010. By 2004 they had already reached nearly half their goal. As of then, fifteen million farmers in 25 provinces had converted more than seven million hectares of crop land back into forest or grassland.

The program provides farmers with cash payments, grain, and free saplings. Those that plant timber trees receive support for eight years, while those that plant orchards and grass get payments for five and two years, respectively. The central government funds the program, but local governments administer it.

In 2003, Z. Xu, M.T. Bennett, R. Tao, and J. Xu from the Center for Chinese Agricultural Policy (CCAP) surveyed 358 families in villages participating in the program in the provinces of Gansu, Shaanxi, and Sichuan. These three western provinces were the first provinces to join the program. The households surveyed included both families that received payments and others that did not. An International Forestry Review article called 'China's Sloping Land Conversion Programme Four Years On: Current Situation and Pending Issues' presents the results.

The paper shows that the program has delivered impressive results, but still has problems. The program expanded much faster than the capacity to monitor and administer it. Many local governments hold back part of the payments they are supposed to give to farmers to cover their own operating costs. Farmers don't always get paid enough to fully compensate for the income they lose by planting smaller areas. Some farmers were pushed into joining the program, instead of doing so voluntarily. The program does not always target the steepest and most fragile locations. Many planted trees don't survive.

If you are going to invest $40 billion dollars in something it is awfully important to get it right. So it is good that the Chinese also invest in groups like CCAP and the Forest Economics and Development Research Center (FEDRC) to study how to do that.

We could all learn a lot from the Chinese example.

--- Michael Bennett
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www.forest-trends.org

[From: ARS News Service <NewsService@ars.usda.gov>]

New quarantine treatment on tap to zap fruit storage pests

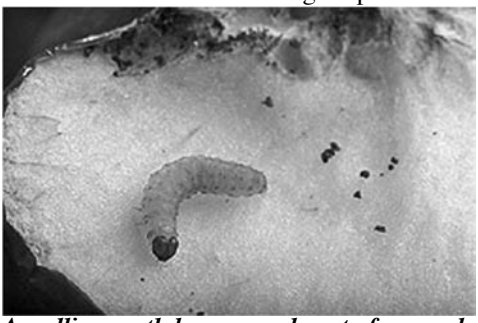
A promising new treatment to kill pests in fruit that was developed as a part of Methyl Bromide Alternatives, a USDA Agricultural Research Service National Program (#308) described on the World Wide Web at www.nps.ars.usda.gov.

Heat + Low Oxygen + High Carbon Dioxide = Dead Fruit Pests

Fruit-loving insects beware: A technology called CATTS, short for "Controlled Atmosphere/Temperature Treatment System," may soon be coming to a fruit packinghouse near you. When that happens, fruit packers will be using this pesticide-free technology to kill insects infesting apples, peaches, pears, cherries, or nectarines destined for foreign markets.

An approach first conceptualized by scientists in the 1930s—but technologically realized for today's fruit packers by ARS entomologist Lisa G. Neven and colleagues—CATTS rids stored fruit of live codling moths, oriental fruit moths, and certain other insect pests by exposing them to a lethal combination of rising temperature and mixtures of low oxygen and high carbon dioxide levels.

Methyl bromide fumigation has been a chief means of disinfesting export-bound fruit. But the chemical is expensive, costing about $10 a pound, and all but exempted uses are prohibited in the United States because of environmental and other concerns.



A codling moth larva crawls out of an apple it infested.

Since 1995, Neven has worked to position CATTS as an affordable, nonpolluting methyl bromide alternative that can be incorporated into commercial packinghouse operations and quarantine facilities.

Done correctly, the treatment causes no significant change to the fruits' appearance, texture, taste, or aroma, says Neven, who is in the ARS Fruit and Vegetable Insect Research Unit, Wapato, Washington. Indeed, in tests, CATTS-treated peaches and nectarines maintained their quality for longer in storage than methyl bromide-fumigated fruit.

"It's a matter of physiology, pure and simple," explains Neven of CATTS's effect. "It mimics what the fruit experiences in the field—we just crank it up a little bit. But the insects' metabolism can't adjust to these changes."

Neven has completed the last of three confirmatory tests on CATTS's ability to kill codling moths in organic apples. ARS will present the results to its sister agency, the Animal and Plant Health Inspection Service, for approval as a quarantine pest-control measure. To qualify for such certification, and ultimately win the confidence of a major trade partner such as Japan, CATTS fruit treatments must be 100 percent effective at killing the insects.

Besides apples—and sweet cherries from earlier research—Neven has completed confirmatory tests against codling moths in peaches and nectarines using two CATTS treatment regimens, and also completed two efficacy tests against oriental fruit moths using the same treatments. She also ran efficacy tests against the pests in apples using a commercial CATTS unit operated by Pac Organic Fruit, an organic packinghouse in George, Washington.

The scientists' Washington State-California collaboration is as much a pooling of resources and expertise as it is a matter of economics: The two states, along with Florida, produce the lion's share of America's $9 billion fruit crop (figure excludes citrus). California is the top fruit producer of the three and also leads the nation in agricultural exports.

The importance of such international trade means that packers and packer-grower cooperatives must take special care in making sure their shipments are pest free. Otherwise, an importing country where a particular insect pest doesn't already occur may reject the shipment or declare an all-out ban on further shipments.

Codling moths are a familiar foe to growers. And consumers know them as the proverbial "worm in the apple." After emerging from its egg, a codling moth caterpillar bores to the core of an apple to feed and develop. It then exits to pupate, leaving behind a damaged apple that's often unfit for sale.

Up to three or four generations of codling moths can emerge to plague apples in one growing season in warmer climates. Pesticide use, pheromone-assisted mating disruption, and insect parasitism and predation can all inflict a heavy toll on this orchard pest's numbers, but some can still find their way into harvested apples. Neven envisions CATTS being most effective in mopping up those stragglers. "You can bring the fruit straight in from the field and subject it to the treatment," she says.

In studies, her group tried many combinations of temperature, incremental heating rates, and O_2-CO_2 blends before settling on two optimal treatments to disinfest fruit. The one incrementally heats fruit to a core temperature of 44 ˚C over 4 hours; the other heats it to 46 ˚C over 3 hours. Both use a 1 percent O_2/15 percent CO_2 atmosphere. The fruit is then cooled before storage and shipping. Neven says these treatments can be fine-tuned to accommodate different cultivars or packing regimens, such as storing fruit in bins versus pallets.

"We've demonstrated that we can treat packed boxes of peaches and nectarines," says Neven. Now, in collaboration with the California Tree Fruit Agreement, Neven and Obenland are exploring ways to treat pallet-stored fruit, further preparing the technology for commercial use.

—By Jan Suszkiw, Agricultural Research Service Information Staff.

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CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: Oct 18, 2005

2005

Aug 23	Tue	* **WANATCA General Meeting (Peter Coyne - Salinity Solution)**
Aug 30-Sept 1		• Dowerin Show
Sept 11	Sun	* **WANATCA Bring & Buy Event**
Sept 15-16		Mingenew Expo
Sept 17	Sat	Karragullen Show
Sept 24-1 Oct		Perth Royal Show
Oct 1	Sat	§ Williams River Produce Open Farm Field Day (page 21)
Oct 4	Tue	**WANATCA Executive Committee Meeting**
Nov 15	Tue	* **WANATCA General Meeting**

*General Meetings are held starting at 7:30 pm. Venue: *As Noted in each case*.
These meetings usually include a display of current world tree-crop magazines offered free.
• Event with WANATCA participation; § Refer to news item in this issue of Quandong.

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