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Açai Palm (*Euterpe oleracea*) See about the cover, pg. 2

DON'T MISS THE NEXT WANATCA GENERAL MEETING:
7:30 pm, Tuesday November 15, 2005

Our speaker at this meeting will be Peter Beatty, of the Forests Products Commission who will speak to us about:

Tree Crops and Sandalwood

Peter has worked for the FPC or its predecessors for around 25 years, starting with the WA Forests Department, which was later merged into CALM (Conservation and Land Management), which itself was split into the FPC and the WA government environment unit.

His interests are all aspects of forestry, and communication about this, including forest management and extension services. He is currently Secretary WA for the Institute of Foresters of Australia.

Peter expects to tell us about the more important current tree crops, with special mention of sandalwood. Sandalwood was once, over 100 years ago, WA's biggest export item. Huge areas of the State were cleaned out by sandalwood pullers, who, as the name implies, took roots and all. Now the Government is encouraging planting of sandalwood to build up a commercial resource, instead of a wild-harvested product.

In This Issue

About the Cover

The açai palm**,** (*Euterpe oleracea* Mart.), is economically important and very popular in Brazil. See stories on pages 24 and 25.

The cover image appears on the website of the Victoria region of Brazil at www.vitoria.es.gov.br/images/secretarias/meio/palmeira_acai.jpg

About the last meeting: Due to unforseen circumstances, our sheduled speaker, Peter Coyne, was unable to present his talk. We hope to reschedule this talk on the important subjects of salinity and water supply some time in the future.

Fortunately, the audience was able to persuade David Noël to tell us about his recent round-the-world trip. He visited some exotic places and (of course!) sampled fruits and nuts along the way, ranging from açai palm berry juice to lingonberries. Here is his description of the Chile leg of his journey.

Andes adventure

I thought that I should visit my 78-year-old brother in England, and instead of going the boring Kangaroo Route through Asia, decided to get there and back with a round-the-world ticket.

Somehow this simple plan mutated into a trip which took 7 weeks, and involved 12 countries (including five in South America), 15 air flights, two ferries, and 1 long-distance train.

The first stop outside Australasia was in Santiago, Chile. There I was fortunate in having a great WANATCA contact in Veronica Loewe of our exchange partner INFOR, Chile's Institute of Forestry, and had the opportunity to talk with Institute staff about our activities in WA.

Within 24 hours of arrival, I was surprised to find myself riding a horse with Veronica high up in the Andes. This was on a property which had been developed from bare hillsides into a productive farm with nut and other trees by Eduardo Astorga, a 94-year-old with 14 children who was still active on the property. On the way back to town from this visit, Veronica stopped at a wayside house where they were selling shelled walnuts and almonds, all hand-cracked by the lady owner.

The next day we visited two properties where high-value timber trees, Veronica's speciality, were being grown. The first one was a Trappist Monastery, where the trees were under the supervision of Martin Charles, a monk of US origin. The species included Cherry and Black Walnut, and showed impressive growth, using special pruning and staking techniques. In the second planting, trials using native 'nurse tree' interplants were giving good results.

The next day I visited the Santiago Markets, where some unusual (for us) native fruits, such as Lucumos, were on sale. This fruit, in the Sapote family, is more starchy and less sweet than commoner species such as Sapodilla, and is used in cakes and ice cream rather than eaten out of hand. The botanical name is *Pouteria lucuma*.

Lucumas

Also on sale were Chile Pine or Araucaria Nuts. The trees are close relatives of Australia's Bunya Pines. Eastern Australia and Western South America were once in contact -- an atlas will show the good fit of Australia into the central curve of South America -- but these lands are now over 10,000 km apart, separated by the Expanding Earth. Botanically *Araucaria araucana*, the trees are the most cold-tolerant of the genus, and as 'Monkey-Puzzle Trees' are found as ornamentals in Britain as far north as Skye, in Scotland.

Later, in a huge supermarket (80 checkouts), I saw huge Pepinos on sale. These native Andean fruits in the Tomato family, botanically *Solanum muricatum*, can sometimes be bought in Australia, and are common in New Zealand, but I had never seen them of this size here.

---David Noël


Araucaria Nuts


Pepinos

[Rare Fruit Council Australia Inc., June 1988]

Fruit characteristics of citrus

It is often puzzling how fruits of the same variety can appear different when they grow in different locations. Why, for example, you might think it more appropriate to call an orange grown in a tropical country a 'green.'

Although the following is written specifically for citrus (over time citrus have been intensively studied and documented) more and more we are realising that other fruit are often influenced in similar ways. The notes to follow are written to give you, the reader, some insight into factors which influence fruit characteristics of citrus and other tropical fruits.

Navel oranges reach ideal size in the warm dry sunny climate of California but become commercially too large in the humid climates of Florida and Brazil while the Hamlin orange is too small in California, but reaches acceptable size in Florida.

Fruit form is influenced by climate. The length of the axis is longer in regions of low humidity and shorter under high humidi-

ties. This influences the shape of oranges. In grapefruit and mandarin this tends to produce a marked neck on fruit grown in dry climates. This may in fact be a temperate effect because day/night temperatures are more even in areas of higher humidity. The nipple of navel oranges is usually more developed in a cold climate than in the tropics.

Colour development is markedly affected by temperature with the best colour developing in cold climate areas and the least colour in tropical areas. The difference between day and night temperatures is the major effect. This difference is usually greatest in the arid subtropics and least in the wet tropical areas.

Other fruit characteristics affected by humidity include smoothness, thickness, texture and adherence of the rind, texture of flesh i.e. coarse or fine and juice content. In the semi tropics of Florida the skin of mandarins is smoother, thinner, softer and more adherent to the flesh and the flesh is thinner and more tender than in fruit grown in the drier subtropical climate of California.

Flavour is influenced by the same climatic influences that affect rind colour i.e. a wide day to night temperature range gives more sugar and acid formation and therefore a better flavoured fruit than in moist tropical areas. Fruits which are generally very acid e.g. limes, kumquats, some mandarins and grapefruit are more pleasantly flavoured when grown in the tropics. This last statement does however depend on individual taste preferences and the relative values will therefore differ with each individual palate.

The Nagpur mandarin of India flowers several times per year and there is wide flavour and texture differences between the Spring and Autumn set fruit. Orchards are managed to give two crops per year from different blocks of trees within the orchard.

Rootstock affect the period of fruit maturity and the ability of the tree to hold fruit. Rough (Bush) lemon rootstock gives a less acid fruit than sweet orange rootstock which usually gives more finely-textured fruit. The lower acid in fruit from trees grown on Rough lemon gives (by most people's standards) a less attractive flavour than fruit from the sweet orange rootstock. Fruit from trees grown on rough lemon stock usually overmatures (loses quality) more quickly than from trees on sweet or sour orange rootstocks. Fruit size, colour, rind thickness, juice content and flavour are all influenced by rootstocks. Rootstock effects are usually less than the variations caused by climate.

Heat units i.e. the number of hours per day x the number of degrees of temperature (above a certain base level) profoundly affect the season of maturity, i.e. early, mid-season or late maturing varieties. Differences are large between species as well as between varieties within each species. Some varieties have the ability to hold their fruit on the tree for extended periods with minimum loss of flavour. The Valencia Orange is an outstanding example of this.

I hope I have drawn your attention to some of the factors which influence fruit quality in citrus. No doubt similar effects will be noticed within many of the tropical fruits. This discourse should help you understand some of the factors which change the characteristics of fruit from district to district.

---Jim Wait, Cairns

Reference: *The Citrus Industry* by N. Reuther, C.D. Bachelor & H.J. Webber, University of California press 1967.

[Advertisement]

ARBOR logic

Gardener's Fruit, Nut & Vine Workshops

Arbor logic now offers a range of workshops covering all aspects of fruit, nut and vine crops. Tailored for hobby farmers, the keen home gardener or anyone with a keen interest in fruits, nuts or vines, there one to suit every need. They are presented by Peter Coppin, a horticultural consultant specialising in tree crops.

Date:	Morning (9am – 12am)	Afternoon (1pm – 4pm)	Venue:
Oct 15	**What fruits to grow and how**	**Pruning & spring care of fruit trees**	Landsdale
Nov 19	**Growing fruit in pots or small areas**	**Summer care & fruit-fly control**	Hazelmere
Dec 17	**All about citrus & avocadoes**	**Budding evergreen fruit trees**	
Feb 18	**Tropical/Exotic fruits and vines**	**Summer budding fruit trees**	Hazelmere
Apr	**Nut and other tree crops for Perth**	**Storing & preserving home grown fruit**	
May	**What fruits to grow and how**	**Pruning & winter care of fruit trees**	
Jul	**Pruning & winter care of fruit trees**	**Pruning & winter care of grapevines**	
Aug	**Pruning & winter care of fruit trees**	**Grafting deciduous fruit trees**	

While the topics look specific, you are most welcome to raise any general fruit growing queries during the question and answer sessions. And come prepared to spend time outside, rain or shine!

Cost:

$45 per person ($80 per couple) for one session $80 per person ($150 per couple) for both sessions

Book for a number of sessions over the series and receive up to a 40% discount:

4 sessions $150, 6 sessions $210, 8 sessions $250, 10 sessions $290, 12 sessions $320

Venues:

Landsdale Farm School is a Ministry of Education Support School. Located just 15 km north of the City of Perth at 80 Landsdale Road, the Farm School is a 4 hectare demonstration farm featuring farm animals, an organic garden, orchard and nursery. Wheelchair friendly and with good facilities, it's a great place for these workshops. There is a kiosk so you can stay for lunch, but we need to order by morning tea so they are not caught off-guard.

The St Barbe Grove Nursery located in **Hazelmere** (Corner Amherst Road & Stirling Crescent) is the headquarters of Men Of The Trees in Western Australia, and has a small orchard mostly of the less common tree fruits. A fantastic spot on the banks of the Helena River with hundreds of purposefully planted native species, it is well worth a visit. The volunteers there will make us lunch but we need to know in advance if you want lunch.

The workshops promise to be informative, fun and very good value
They are held on Saturdays but can be arranged for Sundays – let me know if you are interested

Register by phoning 9382 3433, or Peter Coppin on 0419 906 584, or email: peter@arborlogic.com.au

Arbor logic*Arboricultural Consultants*PO Box 66 Subiaco WA 6904
***tel. 9382-3433 *fax 9382-4922**

For more information on these and other workshops, visit arborlogic.com.au or petercoppin.com. We also hold more intensive one day seminars, so check out the topics covered.

[The West Australian, 2 June 2005]

Berry squeezes out the years

Goji products are all the rage, supposedly conferring great health benefits upon those who consume them.

A juice made from a berry reputed to hold the secret to longevity may give people a taste of what Himalayans have known for centuries.

Goji juice, which is new to Australia, is processed in the United States from wild Himalayan goji (*Lycium barbarum*) berries, according to WA distributor Deanne Kuring, who will provide samples at the WA Food and Wine Festival.

She said the berries, sometimes called wolfberries, were among the most nutritionally dense foods available and contained 19 amino acids, 21 trace minerals and several vitamins, including C and E.

"Goji berries contain four polysaccharides, which fortify the immune system," she said. "One of the polysaccharides in this fruit has been found to be a powerful secretagogue - a substance that stimulates the secretion of a human growth hormone by the pituitary gland; "Research has shown this to be a main contributing factor to the Himalayan people being the longest living on Earth, with an average life expectancy of 95-105, while looking half their age and able to put in a full day's work ploughing the fields."

Deanne said goji berries grew on vines in protected valleys in inner Mongolia and Tibet. A member of the nightshade family, they were deep red in colour and tasted like a cross between a cranberry and cherry. "Himalayans virtually live on these berries. They usually eat a handful, which provides 30-60 ml of juice daily, and that is a good intake."

PubMed, an Internet- based medical research database, has extensive articles on the properties of the goji berry, including adverse reactions with prescription drugs, including Warfarin.

----Olga de Moeller

Fruit of L. barbarum, Timpanogos Nursery

[http://www.gojiberryproducts.com/]
[http://www.gojiberry.com/]
[http://www.nationmaster.com/encyclopedia/Shrub]

Some deeper digging into goji

I pursued the topic of Goji Berries on the internet and found a few disquieting things. People who are allergic to solanums should be cautious about trying goji.

A 'Google' search on the word Goji brought up hundreds of hits, 99% of which were from vendors trumpeting the health benefits of consuming Goji products such as juices, dried fruits, powders, pills and concoctions with various other ingredients.

The remaining hits were warnings that all might not be perfect in Paradise, plus one nursery in the US that offers plants and some brief cultivation information.

Some of the warnings pointed to the fact that there is considerable confusion about the correct names and identity of the species of Goji.

Goji is a member of the *Lycium* genus and the Solanaceae family, or nightshades, that include tomatoes, potatoes, tobacco, capsicums, eggplants, petunias, Australian bush tomatoes, and many more.

There are in the order of 100 different species of *Lycium*, some of which are prohibited in Australia (African Boxthorn, *L. ferocissimum*) because of their weedy habits and ferocious thorns. The correct name for Goji seems to be *Lycium barbarum*, but in places it is called *Lycium eleagnus*. Officially, there is no plant by that name.

As far as common names are concerned, Goji is also commonly called 'Wolfberry,' or 'Matrimony Vine.' Most likely, 'Wolfberry' should be considered to be *L. chinense*. It is very similar to *L. barbarum*, and indeed, Goji berries imported from China are often *L. chinense*; berries of this are said to be more bitter than *L. barbarum*. It is said that dried berries can be identified by their colour: real Goji berries have a range of reddish colours, while the substituted Chinese ones are uniformly red as a result of being dyed.

The encyclopedia site defined *L. barbarum* this way: Chinese Wolfberry is the common name for the fruit of *Lycium barbarum* or *L. chinense*, a species of boxthorn in the family Solanaceae. It is also known pharmacologically as Lycii Fructus (lycium fruit). Wolfberries and lycium bark play important roles in traditional Chinese medicine (TCM), where they are believed to enhance immune system function, help eyesight, protect the liver, boost sperm production, and improve circulation, among other effects. In TCM terms, wolfberries are sweet in taste and neutral in nature; they act on the liver, lung, and kidney channels and enrich yin. They can be eaten raw, brewed into a tea, or prepared as a tincture.

As a food, dried wolfberries are eaten raw or cooked. Their taste is similar to that of raisins. Wolfberries contain beta-carotene, Vitamins C, B1, B2 and other vitamins, minerals, antioxidants, and amino acids.

A search of the PubMed research database revealed only two references to *L. barbarum*: one was a brief mention of the name in a list of other fruits that are possibly helpful in preventing eye disease. The other brief mention had to do with detecting arsenic in wallpaper. I found nothing about adverse reactions with prescription drugs.

---Pat &

[http://www.timpanogosnursery.com/site/928760/page/416906]

Easy to grow Goji Berry plants

This nursery is in the American state of Utah. A web search for '*Lycium barbarum*' also returned many seed sellers that supply this species.

Goji Berry plants are easy to grow once they are established. They will grow in almost any type of soil, light-sandy, medium-loamy, and heavy-clay, but they tend to flower and fruit better in a well drained soil of moderate quality. Goji Berry plants have an extensive root system and are very drought tolerant once established. The Goji Berry plant prefers full sun to partial shade, but plant them in a sunny location for the best Goji Berry production. The Goji Berry does not grow well, however, in wet or soggy conditions.

A young goji plant, showing the large root system.

A beautiful & hardy plant

Goji Berry plants can survive winters down to -15 degrees F (-26°C) and hot summers above 100 degrees (38°C). The Goji Berry grows as a thick bush reaching 8-10 feet tall with vines that can get 12 feet long. Heavy pruning of the Goji Berry plant will keep this bush looking nice and will also help it produce more delicious Goji Berries. In the early summer the plant is covered with small trumpet shaped flowers. Both purple flowers and white flowers are on the same Goji plant. These unique garden plants add color to any landscape with their delicate flowers.

Fresh Goji Berries are sweet & juicy

In late summer these flowers are followed by glossy, bright red Goji Berries. The Goji plant continues to flower and produce berries right up until the first heavy frost. The fresh Goji berries are incredibly juicy and sweet.

Goji Berry plants begin to fruit when they are 2 years old. Very heavy yields can be expected from these unique garden plants when they are 4 to 5 years old.

Grown as a house plant?

The Goji Berry can be grown as a houseplant if given enough light. Goji Berries can be grown under a strong, full spectrum, artificial light or they can be set by a window that gets direct sunlight for at least 8 hours every day. If you choose to grow the Goji Berry as a houseplant, you will need to pollinate the flowers by hand (simply touch the flowers together so that pollen from one flower gets into the other flower).

[Kansas Nut Growers Newsletter, Vol. 45, No. 2, Spring 2005]

Kill the Grass!

Some experiments were done to investigate the relationship between ground cover and the growth and productivity of pecan trees, but the resulting information should be useful for many other crops, and, indeed, individual trees.

A couple of years back we planted container-grown pecan trees at the Horticulture Research Center near Wichita, Kansas. These trees received one of five different treatments; a wood chip mulch, bare soil (roundup treatment), bermuda grass sod, bluegrass sod, or fescue sod. We knew when we established this study, that a grass sod growing around the tree would depress growth but we were surprised to see how much. Keep in mind that each of the sod treatments were mowed regularly just like you would mow your lawn.

Weed control via herbicide or mulch promoted the most growth while trees surrounded by a fescue sod hardly grew at all (see table below).

	Total Dry Weight (g)	
Treatment	Top	Root
Wood Chips	245	589
Bare Soil	211	489
Bermuda Grass	116	314
Bluegrass	86	253
Tall fescue	53	111

In Oklahoma, Dr. Mike Smith looked at the benefits of a wood chip mulch for early pecan tree growth. He compared bare soil to wood chip mulch applied in a 1 m or 2 m square around the tree. All trees were growing in a weed free strip 4 m wide. In this study, the moisture-conserving properties of a wood chip mulch enhanced tree growth (see table below)

Treatment	Trunk diameter (cm)	Tree height (cm)
Bare soil	3.3	157
Mulch (1 m)	3.8	190
Mulch (2 m)	4.0	196

A third study comes from Alabama. In this study researchers looked at weed control in a 2.75 m band down the tree row. They applied 5 treatments: disking, herbicides, mowing (anything that grew), grass sod (mowed), and no weed control. The trees in this study were older and were beginning to bear nuts. The results conform to what we know about weed competition and tree growth and include measured pecan yields. After 3 years of receiving these treatments, dramatic differences in yield are enough to make any pecan orchardist begin a weed control program immediately. The results are given below.

Treatment	Yield (kg/ha)
Herbicides	1628
Disking	1316
Mowing	430
Grass Sod	545
No weed control	308

The Alabama research on weed control continued with a study to determine how large an area should be kept clear of competing vegetation. They set up a trial with treatments that consisted of an herbicide strip of 1, 2, 3, and 4 m wide. They also looked at several treatments that started with a narrow

herbicide strip which was increased as the trees grew older. The results of this study appear below.

Weed Free Zone	Yield (kg/ha)
No weed control	59
1 m strip	54
2 m strip	142
3 m strip	212
1 m yr. 1, 2 m yrs. 2-3, then 3 m	143
1 m yrs. 1-2, then 3 m	168
2 m yrs. 1-2, then 3 m	175
4 m strip	207
2 m yrs. 1-2, 3 m yrs. 3-5, then 4 m	202

The scientists concluded that a 3 m herbicide strip should be maintained for pecan orchards. A wider strip has no advantage but growers can use a 2 m strip during the year of establishment before widening to 3 m. It is clear that weed control and wood chip mulch is beneficial for the growth and fruiting of young pecan trees. In Kansas, we recommend maintaining a weed free area in a 3 m circle around each tree.

In addition, wood chip mulch is a great way to preserve moisture in a non-irrigated orchard. However, a good, cheap supply of wood chips is often hard to find and backbreaking to apply on a large scale. Grass clippings or hay mulches carry the risk of attracting rodents that chew on the roots of young pecan trees, often killing the tree.

---William Reid
Extension Specialist, Nut Crops
Kansas State University

Judicious use of various kinds of poultry and other livestock, carefully supervised, with tree guards, can also help keep the weeds down and reduce the usage of herbicides. ***---Pat &***

[New Agriculturist on-line http://www.new-agri.co.uk/04-3/newsbr.html]

Cloned date palms for Iraq

Dates have been cultivated for millenia with traditional methods. Because date trees come male and female, they are seldom grown from seeds (years until the tree matures enough to identify its gender, and quality would not be guaranteed). Reproduction is usually from offshoots, which has great limitations, for example, strict quarantine regulations. Here is a new method of reproduction that should have great benefits.

Date palms, a 'god-sent' crop for desert areas, could again bring income to the war-ravaged economy of Iraq. Until a few years ago the world's primary exporter of dates, Iraq needs urgently to replace many millions of palms and rebuild output to benefit farmers and the national economy. Date palms are difficult to propagate, with each variety (3000 worldwide) requiring different propagating conditions. But, Iraqi scientists believe that they have overcome this problem with an in vitro cloning system in which tissue growth "buds" are cultured in an artificial medium until seedlings develop. Cloning offers an advantage over traditional use of seeds and cuttings, since it enables large-scale production of genetically uniform plants under laboratory controlled conditions. The cloning system could help to conserve Iraqi varieties, which are particularly diverse in northern Iraq.

[The Sunday Times, 2 October 2005]

$90m fuel deal
Timor link to region's biggest biodiesel refinery

***Jatropha curcas* is ranked as a noxious weed in WA, but it is being grown in many other parts of the world as a source of oil to use as biodiesel.**

Engineering firm MPI Group will build the biggest biodiesel refinery in the Asia- Pacific region in a deal with East Timor that will create up to 20,000 jobs there.

And it looks like another biodiesel technology opportunity that WA could miss out on. Under the 20-year exclusive deal, East Timorese farmers will supply feedstock to a $13 million oil-extraction plant - the largest in the region - to be built by MPI in Cairabela.

The $80 million, 250 million litre-a-year biodiesel refinery is planned for Darwin, but MPI is also looking at sites in Asia.

East Timorese farmers have been contracted to grow *Jatropha curcas* trees, closely related to the castor tree, to supply the vegetable oil plant in Cairabela.

The raw oil will be exported to the refinery in Darwin or Asia, or sold on the open market.

The deal was signed between East Timorese company Daba Loqul Energy, which will contract farmers and help run the oil-extraction plant, and MPI's development arm, Enviroenergy Developments Australia.

East Timorese President Xanana Gusmao witnessed the signing in the capital, Dili.

The initial deal was struck in July, but was announced by MPI and EDA this week. The companies are based in Gordon, New South Wales.

"Within eight to 10 years, East Timor will become the largest regional biodiesel oil producer in the Asia-Pacific region," said EDA director Ed Krsevan. He said EDA planned to list on the ASX next year on the back of the project.

MPI managing director Jim Ferretti said the oil contract with East Timor was for 100 million litres of raw vegetable oil, which would increase to 250 million litres.

"We're taking a different approach to everyone else," Mr Ferretti said. "It's called a feed- stock strategy.

"We're building up the raw material first because that's where all bioenergy projects come unstuck - in the supply of materials.

"The plantations have started physically, and it will take three years for them to be under full production, so effectively there will be about 25 per cent (oil- extraction) capacity in 18 months, and then 50 per cent in the second year and 100 per cent in the third year.

"The biodiesel production will effectively be about 12 months behind that."

Mr Ferretti said the biggest advantage the project had over others was the use of *Jatropha curcas* feedstock. The plant was introduced from the West Indies by the Portuguese 400 years ago as a source of lantern oil.

With no predators, it can be farmed organically. Its oil is low in glycerides and inedible, which means it is not subject to the price fluctuations of edible oils used for biodiesel on the commodities market.

"They looked at palm oil, coconut oil, various grades of rape seed and canola," Mr Ferretti said.

"All of those vegetable oils track the edible oils commodity price... which has no

to the crude oil market.

"*Jatropha curcas* is an inedible oil, so you can contract people to grow it for you and they have no other market.

"Its chemical properties make it an excellent biodiesel feedstock."

Both the WA and Northern Territory governments have classified *Jatropha curcas* as a weed, and it cannot be grown here. Queensland has approved its use.

Of the 150 strains of J*atropha curcas*, the East Timor strain is not self-propagating, so technically is not a weed.

The biodiesel plant design is in the advanced stages, but the Darwin site is not guaranteed.

"The design, technology, due diligence and planning are fairly advanced, but at the moment the client is re-assessing its relocation strategy," Mr Ferretti said.

MPI is building another 40 million litre-a-year biodiesel plant in NSW. It expects turnover of $25 million this year and $35 million next year.

---Cortlan Benneti

A Jatropha hedge
Image from www.euphorbia.de

[http://www.tropilab.com/jatropha-cur.html]
[http://www.biodieseltoday.com/]

Jatropha curcas - physic nut

Some more information about Jatropha from the internet. The whole plant has multiple uses: blue and yellow dye, wax, medicinals; press cake is used in tanning and as organic fertiliser and soil improver. The wood is also a biofuel.

Common name: physic nut, Barbados nut, purging nut, pignon d'inde, kuikui pake.

Family: Euphorbiaceae (spurge family).

Physic nut is a drought-resistant shrub that grows up to 20' tall under favorable condition with spreading branches.

There are male and female plants of *Jatropha curcas*.

Propagation: easy from seeds and cuttings.

Culture: full sun, well drained soil. It thrives on any type of soil, grows almost anywhere; in sandy, gravelly and saline soils. It needs minimal input or management.

Jatropha has no insect pests and is not browsed by cattle or sheep.

Jatropha curcas growth is rapid; it forms a thick live hedge within months of planting. Yields begin from the second year onwards and continue for 40 years.

It does not need much water; is resistant to long periods of drought and can withstand short, light frost. When irrigated it produces seeds during the whole year.

The fruit contains 2 or 3 large black, oily seeds. The black thin-shelled seeds are toxic; they contain the toxalbumin curcin; ingestion of 4 seeds can be fatal.

However, they also contain a high percentage of clean oil (31 to 37 %) used for candles, soap and bio-diesel production for any diesel engine without modification.

As well as the oil for biodiesel production, the leaf and the bark are used for various other industrial and pharmaceutical uses.

Jatropha fruits and seeds
Image from: www.euphorbia.de

Jatropha has insecticidal and fungicidal properties. It has latex that contains an alkaloid (jatrophine) which shows anticancerous properties.

The meal after extraction is an excellent organic manure (38% Protein, N:P:K ratio 2.7:1.2:1).

[The West Australian, 22 September 2005]

Manjimup trio crack Indian apple market

Three Manjimup growers have cracked India's competitive apple market.

Two years ago, Ann Lyster, Rydedale Farm and Newton Brothers were on the verge of pulling 15 ha of high early and red delicious apple trees valued at $288,000, amid low prices and diminishing Australian markets.

Trading as Howzat Export Group, the growers capitalised on a market gap in India. An initial trial of 58,140kg of apples swelled to 969,000kg.

Mrs Lyster said the Department of Agriculture had identified the market gap and the group had sought an Indian partner interested in taking fruit in bulk.

Howzat Export Group has also made significant savings on packaging, which is done in India through the bulk arrangement.

"There was a window of opportunity and we took it," Mrs Lyster said. "We were look

ing at strategies to overcome low prices and thought the more fruit exported the less in the WA-Australian market, which would help to stabilise it."

Mrs Lyster said Howzat Export Group had enough supply to fill next year's order of 50 containers, but had not ruled out recruiting other growers.

"Farmers in Australia have to work together," Mrs Lyster said.

"Individually, we are not competitive and we can no longer fool ourselves into believing that our competitors are not producing good fruit - and often they can do it at a much lower cost."

Boorara Management principal Ken Moore said consolidation was the only way individual farmers could survive in today's tightening national and international supply chains.

He said individual growers reliant on farm income alone were unsustainable and farmers had to unite to be competitive. "Large retailers like Coles and Woolworths don't want to deal with a hundred growers," Mr Moore said. "The days of being a single producer are pretty much over.

"It's too risky. Some may survive if they have low debt and their lifestyle is linked with other incomes, but commercial individual fruit growers who rely on most of their income from the farm are no longer sustainable."

Mr Moore said growers had to become more co-ordinated and professional to eliminate risk and negotiate extra market power.

[*http://ap.tbo.com/ap/breaking/MGBPWJQ65DE.html]*

First U.S. Detection of Citrus Tree Disease in Florida

The discovery of citrus canker in Emerald, Queensland not long ago has major implications for the citrus industry in Australia. Now, another serious citrus disease has appeared in Florida. Let us hope our quarantine service will be able to keep it out.

MIAMI (AP) - A plant illness that could endanger Florida's $9 billion citrus industry has been found for the first time in the United States, agriculture officials said Friday.

The bacterial disease known as citrus greening was found in samples collected from two trees in South Florida, officials said.

Citrus greening is not a threat to humans but it has harmed trees in Asia, the Arabian Peninsula and Africa. Its first U.S. detection was confirmed by the U.S. Agriculture Department after state scientists sent the samples there.

The disease, primarily transmitted by insect, affects the vascular system of plants and causes infected trees to die in a few years.

"It would definitely be devastating to the citrus industry" if allowed to spread unchecked or if it's found to be widespread already, said Denise Feiber, spokeswoman for the Florida agriculture department.

The Asian version of citrus greening was found on two samples of pummelo tree leaf and fruit samples 14 miles apart in the city of Homestead, a farming center in Miami-Dade County. Scientists and agriculture officials were investigating whether the illness had spread beyond that area, officials said.

The disease probably arrived in Florida from infected Asian plant material that came into contact with the insects that spread it, known as citrus psyllids, Feiber said.

Feiber said agriculture officials had been testing for citrus greening since the insects

that carry it were found in Delray Beach in 1998.

Because there is no cure, trees found to have been infected will be destroyed as federal and state scientists determine how far citrus greening has spread. But the disease is not airborne, so finding and killing carrier insects is critical, Feiber said.

The citrus greening threat is another headache for Florida agriculture officials and citrus growers, who have dealt with citrus canker for about a decade. The state has destroyed about 2.5 million trees in commercial groves and 650,000 trees in residential areas in an attempt to get rid of it.

---Adrian Sainz
Associated Press Writer, Sept. 2, 2005

[www.auria.net.au]

Calling all tree growers

David Kennett has been experimenting on improved ways to grow trees at his property near Dowerin. He is calling for volunteers to help him test his theories and expand his information base by taking part in a scientific trial. There are occasional open days at Auria - check the website for details.

If you are actively growing any species of tree in reasonable numbers, anywhere in the world, you might be interested in participating in 'The Auria Tree Research Project'. It will cost you nothing, and the benefits for you could be substantial.

Just about everybody growing trees will have observed that, for no apparent reason:

1. About 15% of their trees die.

2. About 15% of their trees perform significantly better than average.

3. A certain percentage falls victim to attack by insects or birds.

What I have discovered is that it is all about 'precise location'. Simply, there are positions to which trees are predisposed to grow – and the closer they are to 'the right place', the better they will perform. The more people I can get to implement my hypotheses, the stronger the evidence will be to support my theories. In my own project undertaken to develop the hypotheses, over 300,000 trees have been grown in a harsh, low-rainfall environment, with outstanding success.

So what is required of you? All that is required is for you to plant replacement trees of the same variety at a precise distance in a certain direction from the individual trees that have died or have been severely damaged by pests – whatever they may be: borers, birds etc. I need to know various things:

1. The species of trees being grown.

2. The nature of any problems such as borers, birds etc.

3. Where your trees are being grown, such as 115km west and 230km north of Cairns, Nairobi, Sydney, Quito or wherever. The distance and orientation from the original tree position varies slightly from location to location – longitude and latitude.

To make the exercise scientifically acceptable, it is essential that certain simple guidelines be followed.

1. One third of the trees should be planted in exactly the same position as previously. Almost certainly they will also die, but there might have been other factors involved that killed the original tree in that position.

2. A third of the replacement trees need to be planted in the precise positions I indicate

for your property in relation to the dead or insect/bird damaged trees, using your normal methods. The distance for the replacement tree will be given, for example, as so many centimetres northwest or so many centimetres southeast of the tree it is replacing. These trees will, I am sure, perform best.

3. A third of the replacement trees need to be planted 1 metre away in any practicable direction from the position I have indicated as being 'the best position'. These trees, I am sure, will be just average.

4. Finally, a record of the positions of all the replacement trees needs to be made so you know where they are located on your property and a regular record of their performance – height, health, vigour etc. needs to be maintained.

5. When it is felt that there is a positive trend developing, I request that you recontact me.

With sufficient evidence from independent people around Australia and the world to support my hypotheses, the techniques will gain scientific credibility and can be used to enhance the performance of tree crops, wherever they might be grown. As a participant, you will be one of the first to benefit from the knowledge. To become involved in this project, contact David Kennett on (08)9448 0473, or by Email on info@auria.net.au or by mail at PO Box 63, Dowerin, Western Australia. 6461

Vale Joe Tamaliunas

Quandong is sad to report that local rare fruit and nut enthusiast Joe Tamaliunas has lost his battle with cancer.

I remember Joe fondly for the great enthusiasm, coupled with intelligence and insight, which Joe devoted to his plants. Joe had built up a wonderful world-wide network of contacts, and had been able to source many rare plants which had defeated others. He showed great innovation in his methods of propagation and plant nurture, giving success with many tricky tree crop plants.

Joe was able to demonstrate some of his methods to our members when he spoke at a WANATCA meeting a couple of years ago. Even then he had been diagnosed, but carried on cheerfully.

Joe worked for the Federal Taxation Department for many years in a senior position, until ill-health and certain other conflicts forced him out. He always showed great good humour, and I remember a saying of his, "The Government is always right, even when it's wrong".

----David Noël

Earth Garden magazine also reported Joe's passing, as follows:

Earth Garden was saddened to learn that one of our contributors, Joe Tamaliunas, died on 24 May 2005 following a recent diagnosis of a brain tumour. The following obituary was posted on the notice board at the post office in Joe's town of Bakers Hill, WA:

"Every town has its characters, love them or hate them, the world would be a dull place without them. It is our eccentricities and idiosyncrasies that keep us different and shape us into who we are. It is wise to remember, that come hell or high water, these fabulous little quirks cannot be changed, nor why should they? In the end it is far easier and considerably less stressful, just to simply work around the bits that don't take our fancy. Last night Bakers Hill lost one of its characters. Love him or hate him, this is a time for reflection and understanding. To Joe, may you finally have peace."

---Allyson Keyes.

[http://www.rhs.org.uk/learning/publications/pubs/garden0305/newsgeneral.asp]

European trends - looking forward to fruit

Descriptions of several new fruits from the Royal Horticultural Society web site.

Producing home-grown food is still firing the imagination of the home gardener with more and more people wanting to 'grow their own'. This is fuelled by a number of factors - one being the demand for more choice than that offered in the fresh-produce aisles at supermarkets. It is perhaps most obvious in fruit and one trend being seen in the UK is the demand for traditional, locally bred cultivars of apples and pears. However in mainland Europe it appears that gardeners are looking forward rather than back.

The selection of fruit types coming onto the market is ever widening and new cultivars are being selected because of their ornamental value as well as their fruiting capacity. An example is *Hippophae rhamnoides* (sea buckthorn, below), grown commercially in Germany, the berries of which have a high vitamin-C content. When mixed with raspberry juice it is said to make a highly nutritious drink.

Hippophae rhamnoides (sea buckthorn)

Hippophae rhamnoides 'Leikora' and other female (fruiting) cultivars are available in the UK but a new selection listed by a German breeder is H. rhamnoides 'Dorana', said to be much smaller growing and highly ornamental.

From Latvia comes a new Japanese quince, *Chaenomeles japonica* 'Cido'. It is a compact, orange-fruited selection with large fruits that have a hint of lemon scent giving rise to its common name of Nordic lemon. It is said to be an excellent source of vitamin C, and can be used for making jam.

New to the German market this autumn is *Schisandra chinensis* 'Vitalbeer'. Its literal translation is 'vital berry' alluding to the health-promoting properties of the red berries. When eaten raw they are said to taste sweet, sour, bitter, spicy and salty all at the same time but they can also be used to make a form of tea, along with the foliage. The list of claimed health benefits is impressive and includes an aid to digestion. Hardy and deciduous, the plants can be grown in a border or a container producing berries in Autumn. It may be some time, however, before it is available in the UK.

Already listed in the mail-order catalogue of Marshalls is Bavarian fig *Ficus carica* 'Violetta' (left) from German breeder Anton Plattner. It produces large dark, purple fruits (individual fruits weighing up to 110g/4oz have been recorded) and perhaps of most interest to UK gardeners, is that it may be able to withstand temperatures down to -20°C (-4°F).

These are just a few from the range of fruits increasingly becoming available to gardeners in Continental Europe.

[NWFP-Digest-L No. 06/05 June 2005]

Harvesting seabuckthorn at the top of the world

A sustainable programme to harvest seabuckthorn and create products for local and international markets, thereby improving livelihoods and safeguarding traditional knowledge of medicinal plants and the biodiversity of Nepal.

Seabuckthorn (*Hippophae rhamnoides, see pg 18)* is a highly nutritious and versatile berry, containing vitamins C, E, beta-carotene and omega-3 fatty acids. Its berries produce nutrient rich juice and oil, and the leaves can be used for tea and traditional herbal remedies. Seabuckthorn plants are also known for their vigorous root growth, helping to mitigate problems of land degradation, desertification and soil erosion.

A partnership involving an international foundation, university research institutions, local community-based organizations, and practitioners of traditional Tibetan medicine, is working with a hospital and international businesses to build a sustainable programme for the cultivation and sale of seabuckthorn in domestic and international markets.

Three seabuckthorn nurseries were established in 2003, in cooperation with two community-based cooperatives and a local Amchi clinic. The HimalAsia Foundation provided the initial investment for the nurseries as well as training in the sustainable cultivation of the seabuckthorn plants.

Local women's cooperatives have also been trained to harvest and process wild seabuckthorn berries. RECAST, a research centre at the Tribhuvan University in Nepal, and the ITT Cologne are involved in the development of specialized mobile pressing machines, which would enable these local cooperatives to extract seabuckthorn oil on site.

Nepal's only hospital for reconstructive surgery has recently joined the project, and will use the first batches of oil for the treatment of patients with burns and scars.

This partnership will develop a market in Nepal for seabuckthorn products, and it is hoped that the cooperatives will create small- and medium-sized enterprises to meet the domestic demand. International companies have shown considerable interest in buying seabuckthorn products from the local cooperatives, and the initiative will help broker fair business relationships between such companies and the local producers.

[rarefruit@yahoogroups.com]

The taste of sea buckthorn

A testimonial....

I did finally try fresh seaberry/sea buckthorn juice. It is a very sour/acidic juice that requires liberal amounts of sugar or other sweetener. But, it is absolutely delicious. The flavors are subtle and unique. My wife is now addicted to it and we can't find a source. Unfortunately I've tried to grow the plants here in the California central valley and they don't handle extreme dry heat well at all. I would encourage anyone who likes sour/acidic fruits to give the fresh juice a try if you can find it.

---Mike

Sea buckthorn is highly nutritive and medicinal, and grows well in the dry part of the San Juan islands of Washington state.

---Todd Bauer

[www.crfg.org/tidbits/MistPropHome.html]

Mist propagation of plants at home

Simple, practical information about DIY small-scale propagation set-ups.

Successful rooting of cuttings or germination of seeds requires proper temperature, moisture supply and light intensity. Of these, moisture supply is usually the most difficult to control adequately. Water mist, or mist propagation, is a means of automatically maintaining moisture supply near optimum, on a small or large scale.

Mist propagation will not eliminate the necessity of properly taking the cutting or handling the seed, nor will it eliminate the need for careful disease control. However, it offers a means of automatically supplying moisture during the critical periods of propagation.

Location Outdoors

Select an outdoor location that provides filtered shade throughout the day. The location should not be windy - it may be necessary to erect some wind baffles around the propagation area. A convenient method of controlling both light intensity and wind would be to make a small plastic shelter. Wire is used to form the frame and hold the plastic. Cut holes at the top for ventilation. If shading is needed, cheesecloth may be placed on top of the plastic.

Medium

The medium for the germination of seeds or the rooting of cuttings should be porous, well aerated and well drained. Usually, peat moss (or coconut fibre) mixed with an equal amount of fine sand, perlite or pumice is excellent for growing rooted cuttings or seedling. Sand or perlite may be used alone but is not as good as the above mixtures.

Temperature

Temperatures of 18°C to 24°C should be maintained in the medium. Air temperatures of 10°C to 15°C are satisfactory. Higher air temperatures are not detrimental, but lower temperatures may cause injury. If the temperature of the water used for mist propagation is low, the temperature in the medium will be below optimum, and rooting or germination will be delayed or cease. To remedy this situation, use soil heating cables under the pots or flats.

Light

Use light intensity equivalent to open or diffused shade. Mist propagation may be used out-of-doors under light shade, in greenhouses and indoors under fluorescent lights. Under lights indoors, use 40 watt, warm, white fluorescent tubes suspended 12 inches (30.5 cm) above the tops of the cuttings. Two tubes in a standard fixture would be sufficient for a space 3 feet (1 m) wide and as long as the tubes. The electrical system and the fluorescent tubes should be shielded from mist.

Drainage

Adequate drainage of runoff waters is necessary. Outdoors or in greenhouse, there should be a hard surfacing or gravel on the ground. Indoors, provisions must be made to catch the water and dispose of it.

Mist Duration

Intermittent mist - water spray used only part of the time on a regular basis - has been superior to continuous mist. Less water is used, and the resulting plants are superior.

The Setup

While there are many types of controlling devices for mist propagation, for the average situation, a clock-controlled setup is adequate. The parts and their functions are:

Day-night timeclock to turn on the setup

only during the daytime. Unless unusual drying conditions exist, misting during the night usually is not necessary.

Interval cyclic timer to regulate the length and the frequency of the misting. Under average conditions, 5-to-10-second misting periods every 5 minutes should be sufficient. The duration and frequency of misting is regulated to maintain a film of water on the leaves of soft wood cuttings. Some experimentation and adjustment is necessary to insure this under the condition of use.

Magnetic water valve to turn on the water. Under usual conditions, use a normally open valve. In case of electric failure, the valve opens, thus maintaining the film of water on the cuttings.

Mist nozzles come in many sizes and shapes. A baffle type generally is most satisfactory as it operates efficiently under low pressures. Oil or spray nozzles also may be used. Select nozzle suitable for the area to be covered and the placement of the pipe.

A waterline strainer removes particles from the water that may clog the mist nozzles.

Small-scale plant propagation units

The home gardener often wishes to propagate a few plants for demonstration, to increase a highly desirable shrub or to start plants early for the garden. Generally the systems used in nurseries are too large and require more care and attention than the average homeowner can give. However, many small-scale units may be made from inexpensive items commonly found around the home. These units are convenient to use, easy to care for, do not require constant attention and may be conveniently located in the kitchen, on a porch or outdoors in a shady location.

An aquarium makes an ideal unit for home plant propagation. Cover the bottom with a 1 inch (2.5 cm) layer of pea gravel for drainage. On top of this place 3 to 4 inches (7.5 to 10 cm) of a propagation medium such as sharp sand, vermiculite or peat moss mixed with sand or perlite. Or place small pots or plastic trays on the gravel layer. Moisten the medium, and the unit is ready for cuttings or seeds. Cover the aquarium with glass or plastic to maintain high humidity in the aquarium, prevent the cuttings from wilting and hasten rooting.

Large plastic pots may be converted into excellent units. A 6 to 8 inch (15 to 20 cm) flowerpot is a convenient size. Seal the drainage holes with a material such as putty and fill the pot with the medium. In the centre of each pot place a 2 inch (5 cm) clay pot with the drainage hole filled as above. Moisten the medium and insert your cuttings. Fill the small pot with water.

Water passes slowly through the porous sides of the clay pot into the medium, keeping it uniformly moist. At the same time evaporation from the surface maintains moisture in the atmosphere. If all the water is used before rooting occurs, fill the pot again.

Place a plastic bag over the cuttings and tie the open end against the pot. Or place the pot in a plastic bag and close the opening with a rubber band. A stake or two in the pot or wire hoops will keep the plastic from collapsing on the cuttings.

Plastic bags alone may be used to root cuttings, especially some of the easier to root plants such as chrysanthemums and coleus. Tie a ball of moist sphagnum moss around the base of the cuttings, place them in a plastic bag and close the openings.

Small wooden boxes may be converted into propagation units. The box should be approximately 12 inches (30.5 cm) deep, with the top sloped from one side to the other. Seal cracks or holes in the sides. On the bottom, place a

1 inch (2.5 cm) layer of pea gravel. On top of this place 4 inches (10 cm) of the propagation medium. Moisten the medium, insert the cuttings and cover the top with plastic.

Final Considerations

The location of the units will determine to a large extent the success of rooting cuttings. Since each device is designed to prevent moisture loss, it usually will contain enough moisture to last until the cuttings root. Examine the units frequently, however, and add moisture at any indication of drying.

Temperatures will determine the rapidity of rooting or germination of the seeds. Ideally a temperature of 65°F (18°C) to 75°F (24°C) should be maintained. Keep the units in heated locations during the winter. During warmer times of the year, they may be kept outdoors in a shady location.

Light intensity should be controlled carefully. High light intensity is not desirable - diffused light should be maintained. If units are placed in full sunlight, the temperatures will become too hot inside the sealed units, resulting in damage or death of the cuttings or seedlings. Indoors, the units may be placed under fluorescent lights. Lights should be on for 12 to 16 hours a day. Fluorescent aquarium lights may be used on aquariums.

Proper hardening is important. After the cuttings have rooted or the seedlings have emerged, they should be exposed to normal conditions in easy stages. Gradually remove the plastic coverings over a period of several days. Removing the covering too suddenly will result in wilting of the plants, injury or even death.

---Tokuji Furuta

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Leaflet 2560

[http://www.taunton.com/finecooking/pages/c00038.asp]

Making balsamic vinegar

Before the late 1970s, balsamic vinegar was known only to those who might have had the chance to hear of it or taste it on their travels through the Italian cities of Modena or Reggio Emilia and the surrounding countryside. Balsamic vinegar's roots go back to antiquity. It remained a guarded family tradition that existed well outside of commerce. Today there's hardly a supermarket that doesn't carry at least half a dozen brands of balsamic vinegar in a variety of shapes, sizes, prices, and qualities.

An Italian treasure controlled by law

Standards adopted and administered by consortia in Modena and Reggio Emilia govern every aspect of how the vinegar is produced and aged, including bottle shape and even the foil that covers the cap.

True balsamic vinegar wears the name Aceto Balsamico Tradizionale di Modena or di Reggio Emilia on the label. Tradizionale is the key word here. It must be aged for a minimum of twelve years in wooden casks and be approved by master tasters. Small bottles of tradizionale balsamic vinegar start at about US$75 and go upwards of $400.

Making balsamic vinegar takes a lot of time, many barrels, and a little mystery

Genuine balsamic vinegar results from two fermentations: alcoholic and acetic. The first is a slow fermentation of *mosto cotto* (cooked grape juice); this produces alcohol and leaves some sugar. What follows is a second fermentation, in which alcohol created by the yeast is further transformed into acetic acid by aceto (or vinegar) bacteria. The residual sugar, in combination with the acetic acid, accounts for

the sweet-sour makeup of balsamic vinegar. One mystery of balsamic vinegar making is the ability of yeast and vinegar bacteria, normally antagonistic to one another, to exist side by side in the developing *mosto cotto*. This coexistence has never been duplicated in the pure environment of a laboratory.

1. The grapes, traditionally Trebbiano, as well as Lambrusco or other lesser-known varietals, are picked as ripe as weather permits. The grapes are gently crushed, pressed, and passed through a coarse sieve, the juice left to settle briefly before being transferred to a large open kettle.

2. Impurities are combed away and discarded. The juice is simmered between 82.2° and 90.6°C for 24 to 42 hours. (If it gets too hot, the sugar will caramelize, blocking fermentation, and an unpleasant, scorched taste will result.)

3. Reduced by roughly half, the *mosto cotto* is removed from the kettle, cooled, and transferred to holding tanks for fermentation and then to barrels.

4. Wooden barrels are essential to balsamic vinegar's flavor. Built in decreasing volumes from about 100 to 10 liters, the casks are arranged in a series called a battery. Most producers use a variety of woods, including oak, chestnut, mulberry, ash, cherry, juniper, and sometimes other fruitwoods. Each cask is filled to about 80 percent of its capacity, and porous cloth is draped over the large, square opening. The large opening encourages evaporation, feeds the aceto bacteria which need oxygen to convert alcohol to vinegar, and guarantees a concentrated result over time.

Environment is an indispensable aspect of the process. Traditionally, barrels are stored in a clean, drafty attic so the vinegar is exposed to wide fluctuations in temperature (in the Emilia-Romagna, often-torrid summers alternate with frigid winters). Balsamic vinegar is a living substance responsive to the seasons.

5. Topping-up of the barrels happens once a year. In general, starting with the smallest barrel, as much vinegar as is necessary to restore the previous year's level (which decreased through evaporation) is taken from an adjacent larger cask; the level of this cask is in turn restored by a nearby cask, and so on down the line. The largest cask is topped with the fermented, acidified *mosto cotto* of the new vintage. The vinegar grows denser as it ages and travels down the series, while the various woods contribute aromatic complexity. The vinegar is eventually drawn from the smallest cask in the battery.

A balsamico battery consists of three to fourteen barrels. Photo: Paul Bertolli

[nwfp-digest-L@mailserv.fao.org]

Açai palm berry juice

Palm trees that produce very popular foods and drinks in Brazil. Markets in the US are beginning to open up, but this species is still mostly unknown in other places where it could be grown.

Rio de Janeiro is the city that worships health and beauty and where the healthy and the beautiful drink açai. Pronounced ah-sah-yee, açai is more of a lifestyle option than a foodstuff. The berry juice is served half-frozen and its thick gloopiness means that you slurp it up with a spoon. The way it looks is integral to its appeal. It is made from dark violet berries about the size of a raspberry; a deep, dense colour that seems weighted down by its nutritional secrets. It reflects no light and has the texture of mud. It is fruity with a chocolatey kick.

The nutritional breakdown of açai is prodigious. It has high levels of iron, calcium, carbohydrates, fibre and antioxidants. And energy. A small 100g cup has almost 300 calories (1200 kj). Combined with the mystique of its Amazonian origins, açai's contents have made it the beverage of choice for Rio's sporty elite.

Açai is indigenous to the flood plains of the Amazon estuary. The açai palm regenerates with ease and in areas where human development has destroyed natural vegetation, the first tree that grows in its place is açai. (Açai palms cover an area equivalent to half the size of Switzerland.) In this region, its abundance and role as primary nutritional resource cannot be over-estimated: it is literally the fruit that has saved many poor families from starvation. 'Açai is the main food staple of river communities in the Amazon estuary,' says the agronomist Oscar Nogueira. It is drunk for every meal - in much the same way as bread or rice is eaten in other cultures.

Clusters of açai fruits
Photo: Jungle Music Palms and Cycads

Belém is the main city in the Amazon estuary and world centre of açai. In Belém more of the fruit is drunk than milk. An estimated 200 000 litres of the purple liquid is consumed per day among a population of 1.3 million. Açai is highly perishable and the only way it gets to Rio is in frozen packages. In Belém, the fruit is always consumed fresh.

---Alex Bellos in the Observer, 18 April 2004

[Rare Fruit Council Inc. Newsletter, May, 1990]
[www.rain-tree.com]

Açai specifics

Many palm species, including açai (*Euterpe oleracea* Mart.) are the subject of commercial exploitation in South America. Palm hearts, eaten worldwide as a vegetable, are obtained by cutting the palm and removing the crownshaft, in which the heart is found. A close relative of açai, *E. edulis*, has almost been harvested to the point of extinction in its native range. There are specimens of *E. edulis* growing in Alstonville, NSW, and rumours of *E. oleracea* growing in WA.

Açai is a very common, tall, slender palm tree in this important palm family which grows 15 to 25 m in height. The average mature wild tree has 4-8 well-developed stems (10-15 cm in diameter) from a single seed and root system; however, a single seed can grow a plant providing up to 25 shoots growing individually. It has pinnate leaves that start from a prominent crownshaft that is a reddish color. It has adapted to live in periodically waterlogged and flooded soils by developing special root structures called pneumatophores. It produces both female and male flowers which are quite small and are brown to purple in color.

Açai also produces an edible fruit which grows in bunches. The fruit is round, 1-2 cm in diameter, with a single large seed inside surrounded by stringy fibrous sheaths and a thin oily coating. It begins as a green color and ripens to a dark purple. Each tree stem usually produces four to eight bunches of fruit throughout the year but ripe fruits are the heaviest in the dry season (July to December) Each bunch can weigh up to 6 kg and one stem/trunk normally yields, on average, 24 kgs of fruit annually. Its collection from large trees is a difficult and dangerous task.

In its natural habitat under the shady rainforest canopy, the açai tree grows slowly in low light, often taking 4-5 years before producing fruit. The fruit is favored by birds and rodents and the seeds are disbursed through the forest in their droppings. Found throughout the Amazon and especially prevalent in the Brazilian state of Para, açai is extremely common throughout the lowland flood areas along the rivers of northern South America where it forms large groves.

Açai trees (Euterpe oleracea)
Photo: Geoff Stein

In addition, the açai is one of the best sources of palm cabbage. Because the tree occurs in clusters, old trunks can be removed for cabbage without destroying the tree itself. The fruit pulp is high in calories because of its starch and sugar contents. It is also a good source of vitamin A. Its calcium,

phosphorus, and iron contents are significant.

By far, the main use of açai by the local inhabitants of the Amazon is for the preparation of a thick, dark purple juice obtained by macerating the ripe fruits. In some areas, individual consumption of up to 2 litres daily has been recorded. It is often referred to as 'poor-man's juice.' It is so popular, there is usually a small special establishment called an Açailandia in most Amazon river towns and villages that prepare the açai juice and sell it in small plastic bags. Although a basic part of the diet of the poor, açai liquid has become popular throughout all socioeconomic levels. It has a metallic nutty flavor with a creamy texture and oily appearance. To prepare the liquid the ripe fruits are soaked in water to soften the thin outer shell. The fruits are then squeezed and the large seeds strained out to produce a dense purple liquid with a distinctive flavor. In the Amazon, the liquid is often combined with a starchy root vegetable called manioc (which has been dried and ground into a flour) and is eaten as a purple porridge. It is mixed with sugar or sugar cane to sweeten and drunk as a beverage, as well as used to flavor ice cream, liquor and other desserts.

Açai is a staple food for many economically disadvantaged inhabitants of the lower Amazon region area. The açai-manioc porridge is quite poor in nutrition but is very filling with a large amount of starch and sugar. In Belém, a major port and gateway into the Brazilian Amazon, an enormous açai fruit market called Feira do Açai houses 70 to 120 vendors selling over 200,000 kg of açai fruit daily during the dry season. The fruit juice is widely consumed as a staple, however, no medicinal properties have been associated with it. Prepared açai fruit drinks sell for about $2 per litre on the streets of Belém, making it highly affordable for everyone.

Where can I get 'em?

Now that WANATCA's most recent 'Bring & Buy' sale has come and gone, you might be wondering where you can buy fruit and nut trees that are a little more unusual. You might have read about something that sounds very interesting and want to give it a go, but you don't know where to look for it. There are a few nurseries in metropolitan Perth that specialize in the more unusual fruit plants. Here is a list of some of them. If readers know of other nurseries that are not mentioned, let us know, and we will publicise them. And there is a data-base of more detailed information at WANATCA's own website: http://www.AOI.com.au/atcros

Colour Drop Garden Centre,
2696 Albanay Highway, Kelmscott

Wandilla Plant Nurseries,
Welshpool Road
Wattle Grove

Wondawest Nursery,
Marshall Road
West Swan

[Agriculture & Food Industry News: Issue 5, 8 September 2005]

Darrell Lea nutting out choc cost

The price of nuts is rising.... One reason for a shortage of almonds may be a decline in honeybee availability. See the next story about bees.

Chocolate maker Darrell Lea may be forced to increase the price of its prized almond and hazelnut chocolates because of the soaring cost of nuts. The company said almond prices had rocketed by 40 percent in the past year and the price of hazelnuts had tripled. "There seems to be no end to these escalating prices of almonds and hazelnuts," said an executive at Darrell Lea. "We are examining whether we can absorb these increases or pass them on to customers." The company is considering longer-term contracts with suppliers to help offset the rises. Robert Saccoccio, product manager of Scalzo Food Industries, one of the major suppliers of almonds and hazelnuts to confectioners, said: "Prices of these commodities are ridiculously high and there seems to be no end in sight." He said almonds now cost $12 to $13 a kilo and hazelnuts had gone up from $4 a kilo to $12. Confectioners have little chance to use cheaper or alternative nuts if they are producing almond and hazelnut chocolates.

---The Australian, 26 August 2005

[http://www.vegetariantimes.com/document_display.cfm?document_id=425]

A plea for bees

Much of our food supply depends upon bees' productivity and their numbers, both of which are now more vulnerable than ever. This is an abridged version of a story that appeared in 'Vegetarian Times' magazine. See the full document on the website.

One out of every three bites of food arrives on your table thanks to the work of billions of European honeybees *(Apis mellifera*), which shuttle pollen between flowers, a process that makes it possible for plants to produce seeds and fruit. Almonds aren't the only crops dependent on honeybees. So are apples, blueberries, broccoli, cauliflower, cherries, cucumbers, melons, pears, pumpkins, soybeans and squash, among others.

Honeybees are extremely chemically sensitive and pesticides can be fatal to bees. The presence of chemicals makes them very angry. Growers should at least spray at night when the bees aren't flying, or even stop using chemicals altogether.

Farmers' determination to spray their crops with herbicides and insecticides is one reason that American (and Australian) agriculture faces an imminent crisis. Pests, pesticides, disease and habitat loss have led to a 50 percent decline in the number of honeybees since 1950. Parasitic mites, which attack bees and which growers have also fought with chemicals, have become more chemically resistant, making honeybees even more vulnerable.

The Deepening Bee Deficit

While honeybee populations have been declining steadily, the worldwide demand for almonds has boomed. High prices for almonds have led California farmers to devote more and more acreage to the nuts, which are more dependent than any other crop upon honeybees - they require 1.4 million colonies, or half of all commercial colonies in the entire United States.

The deepening honeybee deficit means a windfall for beekeepers with healthy colonies,

but inconvenience and ultimately higher prices for consumers. The fees that beekeepers charge farmers for renting their colonies have doubled overnight to $100 per hive, which will surely drive up what we pay for almonds. Eventually, however, the shortage of pollinators will result in lower yields - not just of almonds but of all honeybee-dependent crops. Eventually, we may see a difference on our tables and feel it in our pocketbooks, in less variety and in bigger grocery bills.

A Hidden Industry

For every dollar that is paid for pollination services, clients generate $50 to $1,000 in crop revenues. By year's end, a beekeeper might drive more than 50,000 km, sometimes working 100 hours a week. He and his bees will move from almonds to cherries and pears, to broccoli, cauliflower and other brassicas, to alfalfa, and finally to cucumbers, squashes and melons.

The constant shipment of bees from one crop to the next and from one climate to another seems incredibly resource-intensive and even slightly irrational for a good reason: it is. Fifty years ago, there were twice as many honeybee colonies in North America and far fewer almond orchards. Then, farmers didn't pay beekeepers for pollination services. Fields and orchards were bordered with natural habitats - forests, fence rows and creek beds - living borders that attracted a diversity of insects, including bees and other pollinators, which can include other insects, birds and bats. Today, that's all changed, to no one's advantage.

A Natural Alternative

The "farmscaping" movement incorporates ground covers, plant strips and hedgerows of native plants carefully selected to attract a host of insects. One goal is to grow beneficial insects in addition to the crops. A variety of plants is used to help reduce pest-control costs. Some plants - rosemary, lavender, and clover, among others dish out a year-long feast of pollen and nectar sources for all kinds of insects, including honeybees.

For five years, biologists at the University of California, Davis studied the insects that thrive at an 80 ha commercial farm that has been organic for 20 years, identifying, counting and tagging them to monitor their habits and numbers. More than 30 different wild pollinators - certain species of bees, flies, moths, butterflies and beetles - thrive in its chemical-free watermelon fields - enough to service not only the watermelons but also the entire farm.

"We definitely need a back-up plan for pollination," explains Claire Kremen, PhD, who headed the research at this farm. "At least seven wild bee species will visit almonds during the cold winter months. But to attract them, you need native habitat." On organic farms surrounded by wild areas, Kremen and her fellow researchers regularly find as many as 50 native pollinators.

---Daniel Imhoff

[Biosecurity Australia News, June 2005]

Protecting our honeybees from exotic pests

Is our system for early detection of exotic honeybee pests doing an adequate job?

Biosecurity Australia has been working to ensure honeybee pests are detected early if they do arrive and the answer is 'yes' so far. Honeybees in Australia have a rare advantage over those in most other countries - they don't have to put up with pests such as varroa mites, tropilaelaps mites and tracheal mites. Scary names perhaps but the impact could be even more worrying.

Varroa is the most significant pest of honeybees world wide; it has managed to invade most countries where honeybees exist. The mite affects honey production by slowly killing off hives. Beekeepers in affected countries have to treat their hives constantly to achieve a level of control. But that is only the start.

Varroa in Australia could kill off feral honeybee hives in bushland - the bees from these hives provide a crucial free pollination service for all sorts of native and commercial plants.

So how do we keep the mites out? We know that honeybees occasionally hitchhike on ocean-going vessels. In order to minimise such events we advise ships' masters and agents to be on the alert for honeybees aboard their vessels. In addition to this awareness campaign, AQIS conducts inspections of containers and equipment targeting those that provide an attractive environment for bees. Yet we can't be certain that we have detected every hitchhiker bee.

The National Sentinel Hive Program provides an additional safeguard by detecting incursions early. It operates at over 25 ports around Australia. The principle is simple: setup a hive close to the port and check it regularly to see if any intruders turn up. That way, we can expect to detect any pest which arrives via that port earlier rather than later.

The technique of hive checking is tailored to the particular pest of concern. Chemicals that kill external mites, but not bees, are placed in the top of the hive and sticky paper placed in the bottom. After a day or two, the paper is removed and examined under a microscope. If mites are present, the dead ones will be found on the sticky paper.

To detect internal parasites, such as tracheal mites, entomologists examine small samples of whole bees under a microscope.

There is yet another intruder, the Asian honeybee, which could both carry mites and cause damage as an exotic competitor. Asian honeybees live in countries close to Australia and would happily thrive in our northern regions. For example, just last November, a nest of Asian honeybees was found underneath a container which had been brought from PNG to Brisbane. So we check for them too.

Using a specific pheromone bait developed by the CSIRO we entice Asian honeybees to make their nests in a specially designed 'log trap We also check these traps regularly to see if any Asian honeybees have moved in.

This program has operated since 2000. While Biosecurity Australia takes a coordinating role, the willing cooperation of state departments of agriculture and of participating beekeepers is critical to the program's success.

Biosecurity Australia continues to review the surveillance program to ensure that it is effective in detecting pests of concern early and prevents them getting a foothold.

[rarefruit@yahoogroups.com]

How do you tell when a mango is ripe?

Australia is very fortunate to have a mango-growing area that spans an enormous distance between 12 degrees south of the Equator down to about 33 degrees. Mangos ripen sequentially from north to south over many months.

A lot of varieties of mango begin to develop what are referred to as 'cheeks' or 'shoulders' (or another 3 letter word from the other end of the body) at the stem end of the fruit. When the cheeks or shoulders become more rounded the fruit is close to ripe.

At the opposite end of the fruit it's a bit 'beak' shaped, and when this beak rounds off and begins to disappear a bit it can be picked. That's when the mangos are picked commercially, they're a bit firmer and travel better. They're stored at 13 degrees (Celsius) and are shelf-ripened at 24 degrees.

Colour varies between varieties, green ones becoming more yellowish with sometimes a rosy tinge. Strawberry mangos are deeply purple/reddish from a young age and don't change much as they ripen.

If left to fully ripen on the tree, mangos are sweeter, but watch out for pests which might damage them. Don't let them drop naturally as they are softer and will damage.

Commercially, fruit which drops (picked when still firm) is rejected, as bruising will occur and will show up later on the shelf.

When picking mangos be very careful. Cut the fruit off with a long stem. Then trim the stem right down to the fruit itself while pointing the stem away from you (or anyone else). The stem of the mango right next to the fruit contains a corrosive fluid and an oil. These squirt out when the stem is cut or broken, the fluid more rapidly. You can do it in a container of water with a bit of detergent in it. That's also done commercially to prevent the fluid from marking the fruit.

---Zig (Northern Territory)

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Mango allergy

Mango allergy can strike even long-time mango enthusiasts. Exposure to the sap and the juice of the fruit skin may sensitize people who previously had no problems. This conversation took place on the rarefruit@yahoogroups e-mail group.

I adore mangos. It is the reason I live where I do, so I can grow mangos. I have been eating them now for years here in Naples, Florida.

This past year I have been somewhat mystified by getting "poison ivy" rash after working in my yard. There was some poison ivy here when I first moved in, but it has been years since I have seen any of the plant. I just kept assuming there must be some little bit of it somewhere that I was bumping into.

Last Thursday, while on a tropical fruit tour of the Florida Keys, one participant complained about her mango allergy and the light began to dawn...

Then, when preparing for the arrival (or passby as it turned out) of Hurricane Dennis, I harvested some of the mangos, figuring I was likely to lose them to high winds anyway. One mango bled profusely down my forearm and I thought to myself...hmmm...

Later that day, I had a "poison ivy" type rash running along my forearm on the exact

path of that mango sap. And now I am sprouting the rash at various places along my arms and even on my ankle!

So, those of you with some experience in these matters. Is it just the sap? Can I still eat the mangos? This week I sliced up a bunch of mangos to dehydrate and also ate some.

Any advice or recommendations? Do I cut down all my mango trees and plant something else? If so, I may move up "north" to Arcadia...

---Erica Lynne

Hi Erica,

I, too, was able to handle mango for many years and suddenly broke out - REALLY broke out! It swells my eyes shut and my skin becomes hard, red, and leathery for about a week. Benedryl was recommended by the doctor to relieve the itch and reduce the swelling.

I love mangos, but have to have my husband or someone else cut them, as it is the oil in the skin or sap from the tree that breaks me out. Then I can safely slice and eat them. Some are allergic to the fruit itself, but thankfully, not me.

---Bobbi

Erica, the most toxic part of the mango is the sap from the tree. The skin of the fruit and layer next to the skin is more allergy producing than the rest of the fruit. So if you are going to continue eating them, which I do not recommend, it is best to peel them. It seems that once you break out with a rash the body can become super sensitive. It is best if you avoid eating the fruit and touching the tree or leaves for at least a year. If you do that, there is a chance that your allergic reaction will go away. It worked for me and that made me very happy as I really love mangos also. But even for those that are not allergic, you should NOT allow the mango sap to get on your skin.

Believe me when I tell you that, YES, eating mangos can cause an EXTREME allergic reaction. Once I had a strong allergic reaction just from eating a marmalade that someone made. I questioned the person who made it and she told me she had just put a few drops of mango juice in the whole jar! I personally had something similar to 3rd degree burns from getting mango fruit juice on my body.

---Oscar, grateful to have gotten over this terrible malady, Hawaii

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When your mango is in bloom stay away from it. The flowers produce a volatile urushiol that makes people (even some of those who aren't usually sensitive) react.

In the future if you're going to touch the wood or the leaves, wear gloves...

---tabbydan

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CALENDAR OF FORTHCOMING EVENTS

Deadline for next issue: Feb 1, 2006

2005

Nov 15 Tue * **WANATCA General Meeting (Peter Beatty - Tree Crops and Sandalwood)**

2006

Jan 24 Tue **WANATCA Executive Committee Meeting**
Feb 21 Tue * **WANATCA General Meeting**
May 16 Tue * **WANATCA General Meeting**
Aug 15 Tue * **WANATCA General Meeting**
Nov 21 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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