



Quandong

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

Second Quarter 2003 • Vol 29 No 2

ISSN 0312-8989 • \$5.00



Leaves, flowers and fruits of *Pereskia aculeata* (See: About the Cover, p. 2)

***DON'T MISS THE NEXT WANATCA GENERAL MEETING:
7.30 pm, Tuesday June 17, 2003.***

For our next event we have as our guest **Joe Tamaliunas**, local rare-fruit enthusiast, who will talk to us about:

Novel methods in propagating unusual fruits & nuts.

Crop tree propagation is full of challenges, and Joe has developed his own responses to meeting these challenges successfully — even local experts will learn something here!

Note: This meeting will be held at Men of the Trees, Hazelmere near Midland.

(a map showing how to get to St Barbe Grove, the MOTT Nursery site, appears on page 5 of this issue of *Quandong*).

Full details on accompanying leaflet. No charge for admission. All welcome.

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About the Cover

The cover drawing, from Frans Geilfus' *El Arbol al Servicio del Agricultor*, shows the Barbados Gooseberry or Golden Pereskia vine, *Pereskia aculeata*. See the story on page 24.

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[Countryman Horticulture / 2003 May 1]

Murchison outlook bright for grapes

Some pastoralists in the Gascoyne Murchison region [arid semi-tropical WA] are taking advantage of the last year of the \$45 million Gascoyne Murchison Strategy (GMS) by branching out into viticulture.

Encompassing every type of diversification from aquaculture to ecotourism, the grants are designed to encourage sustainable and profitable farming methods in the region.

Agriculture Minister Kim Chance was in the district recently to see how the grants had been used and was impressed by what he saw at Wooramel, a predominantly sheep operation run by Tim Hyde.

Mr Chance said that the Hydies had expanded their operations to include table grape production and had taken to the task with vigour.

"Not only are they managing their business and environment better but they are developing sustainable enterprises for future generations," he said.

Mark Lewis, executive officer for the Gascoyne Murchison Strategy, said that the grants had been spent well and that serious growth could result from the viticulture experiment.

"One great advantage of growing grapes this far north is the access to premium markets. The grapes are coming on a lot earlier, up to a



Agriculture Minister Kim Chance and Tim Hyde, of Wooramel Horticulture, discuss pruning techniques to meet premium out-of-season markets that can be achieved from growing grapes north of the 26th parallel

month earlier than anywhere else in the State," Mr Lewis said.

"The people who are involved in this look

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>.

like they will do very well out of it, it gives them a niche in the local market and puts them in a strong position for potential global standing.

"Hard work, experimentation and a good deal of bush ingenuity are being used to make this work, if they manage to crack it, and there seems no reason why they shouldn't, they stand to make great profits," he said.

"Over the past five years we have been working on this and we project that there could be as much as \$7 million worth of quality table grapes being produced above the 26th parallel very soon," he said.

Mr Lewis said that trade secrets in the fledgling viticulture program were worth their weight in gold and weren't readily divulged.

– Julian Reeve

A step toward cooperation for survival: **WANATCA moves its public interface to St Barbe Grove**

The Association has concluded an agreement with Men Of The Trees WA Inc (MOTT) under which MOTT will kindly open their office facility at Hazelmere to handle personal and phone enquiries relating to tree crops.

This agreement is just the latest and closest move in a history of warm cooperation which has existed between WANATCA and MOTT for some 25 years. MOTT has concentrated on planting and revegetating areas of WA which have suffered from excessive clearing in the past, and has had an overriding concern for improving land-use sustainability and ecology throughout our State.

Next year, 2004, marks the 30th anniversary of WANATCA's founding, to "serve all who are interested in the development, use, and conservation of all types of useful perennial plants". The Association's ethos, too, has always included a strong measure of concern for sustainable land use and methods likely to improve the environment as well as being economically viable.

In practical terms, MOTT has helped farmers and local groups plant trees, and WANATCA has helped people establish nuts, fruits, and other tree crops.

After almost a century of vigorous land clearing, the task and cost of re-establishing tree cover in WA is enormous. The past thirty or fifty centuries of human history are replete with examples of civilizations which cleared their tree cover, adopted land-use methods which over-exploited their soil and water resources, and moved themselves to, or dangerously close to, ruin.

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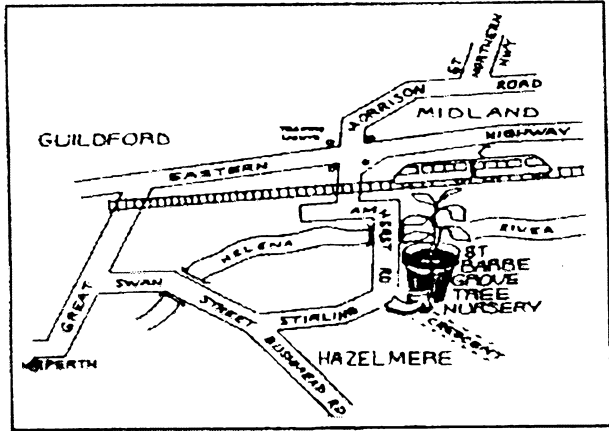
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The former 'Fertile Crescent' people of the Middle East, and the great civilization of the Indus Valley in what is now Pakistan, both ruined themselves in this way. A hundred centuries ago, the huge Sahara desert now occupying most of northern Africa was a landscape alive with elephants, gazelles, and trees in productive savannah lands. And then came herds of domesticated goats.



In the early 1900s, the Americans turned their Tennessee Valley into a vast dustbowl, only rescued from complete disaster by a sustained and expensive rehabilitation program taking decades. In Ethiopia the second half of the 20th century saw the removal of 90% of their tree cover, bringing the inhabitants to famine. And here, in our home ground, clearing has brought the great curse of dryland salinity, eating up our arable land at a truly frightening rate. It may also be responsible for the continuing decline in our rainfall.

Now WANATCA and MOTT can work closely together in helping local farmers and land users, not just to plant trees, but to plant trees which will yield useful products, and so go some of the way towards financing the huge reclamation costs involved.

Practical matters

Set in a seemingly rural tranquil setting at the southern end of Amherst Road, Hazelmere, the MOTT Nursery and office at St Barbe Grove is in fact only a few hundred metres from Midland Station and the rapidly-evolving Midland Redevelopment Authority precinct (see sketch).

The MOTT contact details are — phone:

9250 4493, fax: 9250 2735, email: contact@menofthetrees.com.au, website: www.menofthetrees.com.au, opening hours Mon-Fri 8.30 am to 3.00 pm. MOTT has a range of interesting programs, and welcomes volunteers who can spare a few hours to help run these programs.

WANATCA can be contacted at these same phone and fax numbers. Mail and email enquiries should go to PO Box 565, Subiaco, WA 6008 and wanatca@AOI.com.au. The extensive website, with facilities to join on-line, is at www.AOI.com.au/wanatca, and extensive tables of treecrop information are at www.AOI.com.au/atcros.

— David Noel

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[Sunday Times / 2003 Mar 23]

Organic olives open up niche market

One of WA's best-known names has turned to organic olive farming in a bid to break into a niche market.

Mark Kailis, son of Peter Kailis of Red Rooster fame, established Kailis Organic Olive Groves (KOOG) last year. The company is growing olives on 60 ha of groves in WA's South-West. A further 177 ha are being seeded.

The volume of oil to be produced will make KOOG the single largest producer and marketer of organic oil in the world. Massive investment in the Australian olive industry in recent years is likely to result in an oversupply of conventional olive oil.

The Kailis family is gambling that the organic angle will give KOOG an edge over conventional producers. They have been planting olives for 22 years and producing commercial olive oil for the past eight years.

Having witnessed BSE scares in the UK and changing food trends in the US and Asia, KOOG had been slowly moving in the direction of organics. It underwent full transition to organic farming 20 months ago and is hitting the same production levels being achieved before giving chemicals the flick.

The bulk of Kailis's olives are grown in the



*Mark Kailis, managing director of KOOG.
Picture: Kerris Berrington*

Preston Valley, with most of the research done at the family farm in Baldvis. The Kailis family vineyard once grew grapes for wine label Baldvis Estate. The label was sold to Palandri Wines two years ago. KOOG's company board includes ex-Water Corporation chairman Peter Jones, Theo Kailis and Lee Verbs, chairman of law firm Deacons.

Organic farming expertise is being provided by Professor Lyn Abbot, head of UWA's organic research facility. KOOG will sell organically certified oil at the same cost as conventional olive oil. The bulk of oil produced will be sold into the extra virgin market. The remainder will go to the mid-to high-range market. KOOG plans to produce 1.2 million

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litres of oil in the next seven years.

Australians consume about 25,000 tonnes of olive oil a year, with imports supplying 24,000 tonnes. Demand for oil in Australia is expected to grow by between 2.5 and 10 per cent a year. "Consumers can take our products organically certified or they can buy another product which is not certified for the same cost," Mr Kailis said.

Research shows consumers are attracted to organic food for its taste quality and from concern about food safety resulting from genetic modification and hormones.

KOOG is going through "very private capital raising". "At a later date, no doubt, we will be looking to take it into the public arena," Mr Kailis said.

— *Nick Butterly*

[From the current issue of Men Of The Trees Newsletter, "MOTTO"]

Welcome to WANATCA!

The stage is set for Men of The Trees at St Barbe Grove to become the main agency for the WA Nut and Tree Crop Association.

We have enjoyed a solid friendship going back at least 20 years. Indeed, the Tree Farm Project is our response to WANATCA's vision that we should seek ways to grow more food on trees. What a lot of sense that makes! Trees do so much for the planetary environment that to plant food-bearing trees and harvest their produce would at the same time improve the soil, contain salinity, reduce wind erosion and

provide income to the grower.

So from June onwards enquiries about WANATCA will be handled through St Barbe Grove. Members will be relieved to know that David Noel, Wayne Geddes and Stanley Parkinson remain as the team handling all nut and fruit tree business. Only the WANATCA telephone number will change, to merge with ours, 9250 1888.

There will be new opportunities for our members to get wise about fruit trees. WANATCA will be holding some of their meetings at St Barbe Grove, and David Noel will become a familiar visitor as he takes on the role of consultant in the management of our orchard. Welcome, David!

— *Barrie Oldfield*

New face on the WANATCA Executive

Your Association's Executive Committee is very pleased to welcome John Cory on board.

John was recently co-opted (ie mildly dragooned) onto the Exec to fill a vacancy, but has been working tirelessly for many years to help build tree crop industries. He is our Action Group Leader for Macadamias, and is also a local expert on pistachios and pecans.

The original owner of Gidgegannup Nursery, 30 km east of Perth, John now sells trees through his business Shelterbelter. As well as trees, John has worked hard to provide appropriate machinery, such as macadamia harvesters and crackers — this sort of service makes all the difference to building up local tree crop industries.

John is also the prime mover in a proposal for WANATCA to run a Conference on Nuts in WA, possibly in 18 months time.

Shelterbelter: A1505. See ad in this issue.

[Countryman Horticulture / 2002 Feb 7]

Worms give wine maker cheap labour

Worms are the unpaid labour in vineyards and orchards around the Chittering Valley since worm farmer Kevin Smith set up business 10 years ago.

Local growers have been using worm by-products for years and have found that the worm castings can replace all fertilisers.

And they say the leachate, which Mr Smith calls Worm Whizz, is excellent used in the irrigation system as a liquid fertiliser and ideal as a foliar spray to combat mildew.

The red wiggler worms farmed by Mr Smith and his wife, Debbie, at The Worm Shed are credited with making nutrients more available to plants.

By feeding organic matter and compost to



Worm farmer Kevin Smith supplies unpaid labour to vineyards and orchards around the Chittering Valley

the worms and using the resultant worm by-products as a fertiliser Mr Smith estimates five times more nitrogen becomes available to plants that otherwise would remain locked in the soil.

The results for phosphorus and potassium are even more impressive. Mr Smith said seven times more phosphorus became available to plants and 11 times more potassium.

Unfortunately for Mr Smith, the figures are unsubstantiated by scientific research but are endorsed by growers who have been using worms for years to power their soil fertility.

"We hope the Department of Agriculture and other government agencies become more interested in worms and conduct more research because at the moment it is just trial and error," Mr Smith said.

"It's frustrating because we know there are benefits but until research is done we will not know exactly what the specific benefits are or simple things such as application rates for worm castings."

Carolyn and Peter Moloney, of Dintonvale Vineyard Estate, in the Chittering Valley, have a large-scale worm farm in their organic vineyard using worms from Mr Smith's Worm Shed.

Mrs Moloney said their three-year-old vines had been planted into worm castings and as young vines had been fertigated with Worm Whizz once a week.

"Traditionally, vineyard managers have planted young vines into superphosphate to

give them a boost but the super kills native earthworms," she said.

"The worm castings are a natural complete fertiliser that increase soil health.

"It's worked extremely well. A lot of people told us to expect reduced yield with organics but we have found that our production rivals any yield in a conventional vineyard and the quality is excellent."

The Moloneys' 6 ha Shiraz, Cabernet Sauvignon and Viognier vineyard is contracted to Western Range Wines and is 12 months from full organic certification through NAASA.

"We don't use other fertilisers and we don't spray," Mrs Moloney said.

"Our vines are disease free, we don't have beetle, our nitrogen levels are perfect and our pH is an ideal seven.

"The bonus is the worms feed the soil, increase microbial activity, feed the plant and there is never any runoff to pollute the waterways."

The Moloneys' vineyard is on the banks of the environmentally-sensitive Brockman River, so any fertiliser run-off could contribute to nutrification of the river and ultimately algal blooms downstream.

In a year when drought is curbing water use, the worms' ability to save water becomes a critical advantage for growers.

Mrs Moloney said the worm farms on their property were located between vine rows directly under vines so the worms would create channels lined with mucus which the roots of the vine would follow down.

"When the red wriggler worms have done their work to a depth of about 18 inches, the earth worms continue the work and encourage the roots to go deeper," she said.

"Deeper roots mean our vines use half the amount of water of conventional systems".

Mrs Moloney said the worm system was costly to set up but the cost was a once-off investment that paid off in early vintage and nil-to-low off-farm input costs,

The Moloneys plan to grow high-nitrogen crops such as tagasaste to feed to the worms to increase the nitrogen content of their castings, and they already feed the worms crushed limestone to keep the pH constant.

Keeping off-farm inputs low was a hip-pocket benefit as well as a distinct advantage in helping keep the property disease and pest free.

Mr Smith said a large-scale commercial worm farm which went through 200 kg of waste a day would cost \$20,000 to setup. The worms were responsible for most of the cost.

By contrast, a small residential system in an old bathtub cost \$80 to establish.

Mr Smith said he sold worms on a sliding scale depending on quantities purchased – from \$20 to \$40 a kilo.

Contact Carolyn and Peter Moloney, of Dintonvale Vineyard Estate, Chittering Valley, on 9571 8252 or Kevin and Debbie Smith, of The Worm Shed, Scenic Drive, Bullsbrook, on 9571 8003. ¥

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[BioOrganics Inc., Newsletter / 2003 May]

Don't Get In The Way Of The "Good Little Soil Bugs"

The more I learn about how soil and worms and fungi and bacteria and plants interact, and how their underground "systems" work, the more I realize how mistaken we are about so many things.

Our intentions are good — we're following prevailing soil chemistry advice given in textbooks, articles, and by crop advisors — but much of what we do for (or to) our plants and crops is horribly wrong.

To understand the problems, first consider the natural cycle of plant-soil-microbial relationships which have evolved over millions of years (greatly, greatly, simplified).

1. Leaf litter, dead plants, bird and animal droppings fall to the ground.

2. Decomposing fungi and bacteria "digest" the fallen material.

3. Earthworms feed on the decomposed material and then transport it underground.

4. Other types of fungi and bacteria feed on the earthworm castings, further digesting it.

5. The bacteria produce nitrogen and digest minerals into forms plants can use.

6. A plant seed sprouts or new root growth occurs in the biologically-active soil.

7. Mycorrhizal fungi attach to the roots and send millions of root-threads out into the soil.

8. The plant extends its leaves up into the sunlight, and performs photosynthesis.

9. Mycorrhizal fungi and bacteria feed on root exudates generated by photosynthesis.

10. In return, the fungi forages for whatever nutrients the plant requires for full health.

11. The plant thrives aboveground with these symbiotic actions going on underground.

12. Leaves drop and/or annual plants die and we go back to Step #1.

The closer we can replicate the above cycle, the better our crops and plants perform.

It's difficult, and I would even say impossible, to improve on it. It seems that our goal should be to figure out how to work WITH the established method instead of trying to take over the complex soil functions ourselves.

But aren't we helping the plants when we "feed" them? Well, not when we drench the soil with immediate-acting fertilizers, synthetic or organic. Small amounts of gradual-release broad-spectrum fertilizers and minerals can offset the leaf litter (crops) that we remove from the field, but whenever possible the crop residue should be allowed to remain in place.

Are we helping when we turn over the crop residue by ploughing it under? Well, a no-till or limited-till program will keep the underground biological communities from being disrupted. A rototilling is the equivalent of a powerful hurricane levelling a human city. There are impressive results being reported from no-till agricultural studies and I expect many more farmers and gardeners will adopt this practice.

The "little soil bugs", if encouraged to develop into large populations, will keep the soil fluffed-up for good aeration, will provide nutrients (in ideal proportions) for plants, and

will protect the roots from pathogens. They will happily do all this work for free and will not contaminate our water supplies.

A side note on "Organic" additives: From my biological perspective, the "nature=good," "manmade=bad" orientation is an imperfect way to judge materials. It does have the general benefit of prohibiting the most harmful fertilizers, such as high analysis fast-acting synthetics (i.e., 20-20-10) which can be lethal to mycorrhizal fungi, but it gives the impression that all natural materials are OK.

In fact, a drench of liquid fish can disrupt the soil system far more than applying dry pelleted fish. A slow continuous supply of the broadest possible array of nutrients is the feeding objective for bio-growers.

For good reading on this subject, the March/April issue of *The American Gardener* (the magazine of the American Horticultural Society) has an article entitled "Fertile Ground." One quote from a gardening writer: "I believe the biology of the soil creates the chemistry. It is only when the biology is killed off, as it is with salt-based fertilizers, pesticides, tilling, etc., that the chemistry takes over." I say Amen!

The June issue of *Mother Earth News* will also have an excellent article on mycorrhizal fungi written by Doreen Howard, who has considerable first-hand knowledge of biological inoculants.

Both articles are geared toward home garden issues, but the overall descriptions of natural soil systems are certainly worthy of study by commercial growers, landscapers, plant researchers, and government officials concerned about agriculture and/or environmental issues.

— *Don Chapman*, President, BioOrganics, Inc.

[All the BioOrganics newsletters from 2002 are available by clicking on the link "2002 Newsletters Archive" at: <http://www.bio-organics.com>. Free e-mail subscriptions, comments, or questions to: don@bio-organics.com. BioOrganics, Inc. Endomycorrhizal Inoculant (BEI) is listed by the Organic Materials Review Institute (OMRI) for use in production of organic food and fibre.]

The Second International Macadamia Symposium

Twin Towns Resort and Services Club at Tweed Heads, overlooking the beautiful beaches of Queensland's Southern Gold Coast, is the chosen venue for the Second International Macadamia Symposium.

The Symposium will be held between the 29th September and the 4th October, 2003 with a Post Symposium Tour heading north to the Bundaberg Region from the 6th to the 11th October.

'Building Global Strength' is the theme - chosen specifically to continue developing and building on those relationships which

began during the first International Symposium held in South Africa in September of 1999. We believe this 'theme' will provide an excellent point of focus for all attendees and allow for the maximisation of opportunities which occur only at an International gathering such as this.

The Second International Macadamia Symposium, Tweed Heads, NSW Australia, 29th September - 4th October, 2003.

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macadamiasymposium@acclaimsemn.com.au
 Website: www.macadamias.org*

[*Agroforestry News* / 2003 Apr]

Coppicing in olives more profitable than pruning

One of the most difficult, expensive and time-consuming practices when growing large fruit trees (on vigorous rootstocks) or nut trees is pruning. Without regular pruning, large fruit trees tend to produce small fruit, although still in good quantities, which is fine for processing into juice etc. but is not fit to be sold for culinary use.

Fruiting also becomes limited to the very outer edge of the tree canopy, with bare branches beneath. Trees become very large and harvest itself, if fruits are to be picked from the tree, becomes difficult.

One option to overcome these problems is to use dwarfing rootstocks, though they are not available for most nut trees. There are several drawbacks, though, with dwarfing rootstocks: the tree is not very long-lived (perhaps 30 years), has a high nutrient demand so requires lots of feeding, is not very drought tolerant, so may require irrigation more frequently, and is very intolerant of competition, so it needs a continuous weed-free area around the trunk.

Vigorous rootstocks, on the other hand, tend to be longer-lived, have a larger root system and so can forage for nutrients and water more efficiently, and can tolerate competition once established — very useful if the area below is grassed for grazing or cut forage, or used to grow understorey crops.

A possible solution to this dilemma is to plan to coppice vigorous orchard trees on a regular rotational basis. Not very much research has been done on this topic, but an interesting 20-year experiment with an olive orchard (described below) shows that although there is an obvious yield loss between coppicing and fruiting re-starting, and thus a drop in overall yields in the long term, the saving in time by not pruning more than

compensated in economic terms for the yield drop, and the coppiced orchard was in fact more profitable than the normally pruned comparison.

A coppiced olive orchard

Olive trees were planted at 6 x 6 m spacing in Italy in spring 1969 and trained to a vase bush (a 3-trunk vase with a short trunk) by regular annual pruning until spring 1980. The orchard was then divided into 10 plots of about 20 trees each, and all trees in one plot were cut off at ground level. Olive trees are known to coppice well from the trunk when cut to the ground.

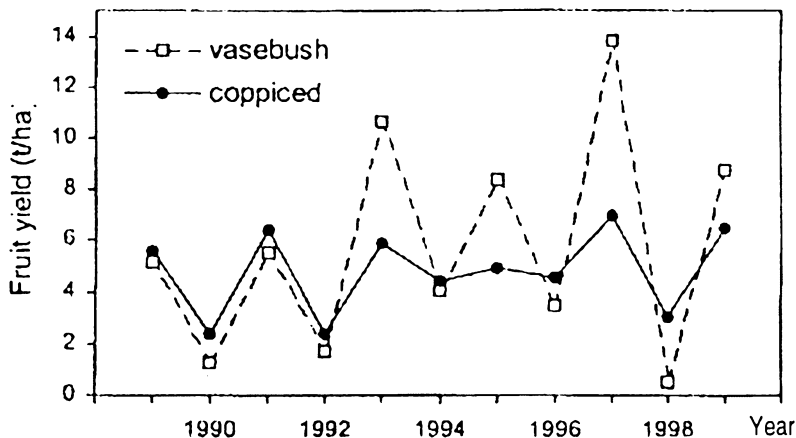
In the following years coppicing was extended to one additional plot per year until 1989. In 1990 the plot first coppiced in 1980 was coppiced again to begin a second cycle of coppicing. All plots were managed according to standard practice and not irrigated.

During the 10 years of each cycle, pruning was limited to the elimination of a few suckers in the centre of the canopy on the third year after coppicing.

The onset of fruit production occurred the third or fourth year after coppicing.

Results

The coppiced system required a maximum of 14 minutes per plant pruning over 10 years, corresponding to 6.5 hours/ha/year. Pruning the vase bush control took about 17 minutes per plant per year, corresponding to 78 hours/

Fruit yields of coppiced and control plants from 1989-1999

ha/year. Hence the coppiced orchard took only 8% of the pruning time that the standard control orchard took. Also, coppicing is a much less skilled practice than pruning and costs less for the labour employed.

Fruit yield of the coppiced orchard was 85% of that of the adjacent control orchard trained to vase bush. If the unproductive years after coppicing (years 1-3) are excluded, the coppiced plants yielded 17% higher than the control plants.

Alternate bearing was less in the coppiced orchard than in the control. Yield fluctuations overall were greater in vase bush trees than coppiced trees. No effect was found of coppicing on the fruit or oil quality, nor of the occurrence of pests or diseases.

One possible drawback was that mechanical trunk shakers were unsuitable for coppiced trees because of their multiple, smaller, stems.

Discussion

There was no evidence of declining production in the coppiced orchard. One of the most interesting results was the lessening of the alternate bearing habit which is typical of olives and many other fruits and nuts.

The main advantage of the coppiced orchard is the reduction of pruning time and associated costs. Other advantages are the low cost of management, the ease of adaption to most cultural conditions, the reduction in tree size, and reduction of alternate bearing.

Vigorous trees like standard apples and

Fruit yield per plant over the period 1989-1999

	Fruit yield - kg/plant	% of vase bush
Vase bush	20.5	100
Coppiced orchard (all)	17.4	85
Coppiced orchard (years 4-10)	24.0	117

most nut trees would be expected to behave much the same as olives, with fruiting starting 2-4 years after coppicing.

There may be disadvantages in coppiced orchards of grafted trees. The olives in the trial above were grown from cuttings so are not grafted. The only other fruit/nut trees commonly propagated on their own roots are hazelnuts. Coppicing of grafted trees could not be quite as low to the ground (it might be more like pollarding), and the coppicing itself might encourage the rootstock to start suckering. The pruning cuts may make

infection by bacterial diseases more likely. One possibility to overcome some of these problems is to use fruit trees on their own roots.

— *Martin Crawford*

Reference

Gucci, R et al: Performance of an Olive Orchard Managed by Coppicing for 20 years. Acta Hort. 557, ISHS 2001.

Agroforestry News: A2768

[West Australian / 2003 May 17]

Mallee oil plant set for July start

The outcome of a multi-million-dollar experiment to establish a viable oil mallee industry on salinity prone land is expected in July.

At Narrogin, a \$7.8 million pilot plant to convert chipped mallee bushes into electricity, eucalyptus oil and activated carbon is 75 per cent complete.

Ashley Challenor, of Western Power's business development branch, said

commissioning of the 20,000 tonnes a year plant was expected to start in July.

It could reach its 15,000 tonnes a month capacity within a year, processing mallees grown on some of the 1000 farms in WA where the native trees have been planted in a bid to arrest salinity.

Mr Challenor said the plant was the first of its kind. It combined new technology developed by the CSIRO for converting plant material into carbon and gas available for power generation with standard technology for distillation of eucalyptus oil.

The plant will generate one megawatt of power, enough for a town the size of Williams.

By-products include 210 tonnes a year of eucalyptus oil, worth from \$600,000 to \$2.3 million, and 690 tonnes of activated carbon, worth an estimated \$2 million.

Activated carbon is used in water filters and other industrial purposes because of its

Nut & Tree Crop Consultants

<A1101> • (Principal: David Noel)

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enormous surface area per unit of volume.

The preferred species of mallee for oil production is *Eucalyptus polybractea*, which is native to Victoria and NSW and has the same aroma as commercially available eucalyptus oil. A local species, *Eucalyptus loxophleba*, produces more wood. More than 1000 farmers have planted about 24 million mallee trees in the Wheatbelt.

Mr Challenor said about 10,000 tonnes was available for harvest in the Narrogin area and this would increase as new and existing plantings reached maturity.

John Bartle, of the Conservation and Land Management Department, said it had taken a decade to get to the stage of testing.

At first the bioenergy and oil were seen as the valuable products but activated carbon and renewable energy credits could help the process to be commercially viable.

He said research had found planting up to 15 per cent of the landscape with mallees arrayed to intercept rainfall could stop the surplus ground water which caused salinity where annual crops had replaced native bush.

— Peter Trott



Western Power's project manager Ashley Challenor inspects mallee trees outside the Narrogin wood processing plant. Picture: Lee Griffith

WANATCA Yearbook to go on-line

Since its inception, WANATCA has produced two different publications, *Quandong* and the *WANATCA Yearbook*, issuing them in conventional print form.

These two publications have had different aims. *Quandong* has carried details of Association meetings and events, news items of interest, reviews of new books, reprints of short articles drawn from world-wide sources, and members' comments and queries.

The *Yearbook*, on the other hand, has carried longer original or adapted articles thought to be of longer-term reference interest to everyone involved in tree crops, and we know that some members have treasured these Yearbooks as part of their reference libraries. However, there are very few spots where the complete set of all of the Yearbooks can be consulted, and so much of the older (and still valuable) material is no longer available to members.

The in-principle decision has now been taken to make future and past Yearbook

material available to members on line, on the Association's website. Currently-selected material will appear directly in PDF form, the intention is to convert all past issues for the website as soon as feasible. PDF documents are in a compressed pre-laid-out format which downloads rapidly and prints simply, using a free, everywhere-available program called Adobe Acrobat Reader.

Once there is a body of material on the Yearbook site, members who have notified us of their e-mail address will be issued with a simple password which will give them access to the site for the following three months. Members without e-mail can get the current password, to use on a friend's or the local library's computer, by ringing, faxing, or writing to the WANATCA Secretariat. We hope that when in full operation, this will provide a significant new benefit to members.

The PDF files are almost the exact equivalent of a conventional printed document,

and can incorporate such features as colour photographs very easily.

There is NO current thought of converting *Quandong* Magazine to on-line form, as it serves quite a different purpose. While technically feasible to convert, and while the information resources of the whole Web are enormous, the magazine is not intended to be an information resource to be consulted as the need arises.

Instead, *Quandong* aims to provide readers with a lively, entertaining, and useful current package which drops into members' letterboxes without any search effort. A Web search will give you information which you know you want to find out about, the magazine aims to bring up things which you didn't know you wanted (or needed) to know about!

Any comments on this project are welcome.

— *David Noel (Publications Editor)*.

[*Sunday Times / 2002 Nov 17*]

Going bananas in Perth

Bananas are one of the most-consumed fruit on earth. They hail from tropical climes, but you can buy them throughout the world.

Perth is considered too cold for commercial planting, but creating a microclimate in a suburban back yard makes home-grown bananas an attractive crop.

Unlike most other fruiting plants, bananas are classified as herbs, because they have no woody tissue in their trunk.

The plants are supported largely by the water that fills up the large cells in the trunk. Moisture, therefore, is the key to successful growing and cropping.

Ornamental as well as productive, banana plants add a tropical atmosphere to your garden

or poolside area.

They can even be grown successfully in large tubs. A particularly attractive and massive variety known as Abyssinian banana is inedible but often cultivated for its lush looks alone.

Choose a full-sun position, preferably north-facing, to maximise winter sun hours. Winds play havoc with the tender leaves and the shallow roots, so select a protected site or create a temporary windbreak with fast-growing bushy plants or shadecloth.

Sandy soils are not ideal, but with the

addition of considerable quantities of peat, compost or well-matured cow, sheep, horse or chicken manure you can create a superb growing medium. Work on the proportions of three parts organic material to one part original sand.

A high level of moisture during the warm months is essential, either by trickle or sprinkler irrigation. Mulching with organic material such as peat, matured sawdust, animal manure or woven mulch mat will help to retain soil moisture and increase humidity.

Regular and heavy feeding will promote rapid growth and an early onset of fruiting. For mature plants I recommend using NPK Blue fertiliser, applied at the rate of one half cup every six weeks from September to March.

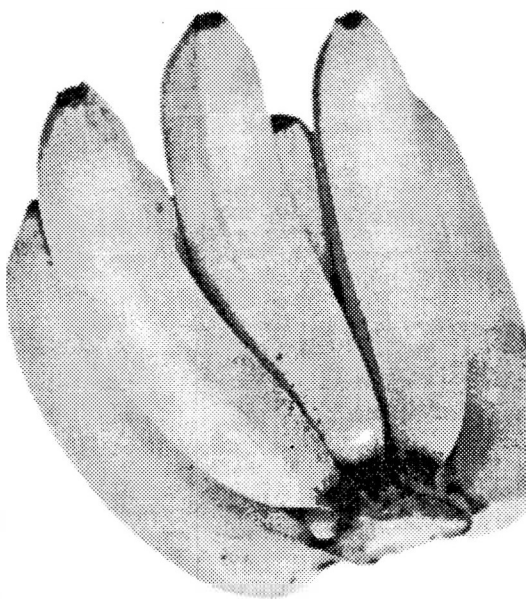
Growing bananas near larger trees or buildings can dramatically lessen frost damage in susceptible areas.

Bananas produce suckers throughout their life and these can sap energy from the main plant. Commercial growers cut and chemically burn the suckers at a young stage.

In the home garden it is a good practice to allow only two small suckers to grow alongside the parent plant. All others should be cut off as soon as the shoot emerges.

Once the main plant has fruited it will subsequently wither and die. This is why you need to retain one or two suckers, so they can grow up to provide fruit the following year.

Suckers are also a means of reproduction. When they are about 30 cm to 40 cm high they can be removed from the parent plant with some roots formed at the base. The large yellow-orange or bright red flowers are showy and I was intrigued to see the unopened flower cluster of banana offered as a savoury vegetable. Sliced thinly, it looked exotic and had a flavour similar to globe artichoke.



Fruit can mature as quickly as 13 to 15 months after planting. I recommend that you cover the bunches of fruit soon after they have formed. It is best to use a plastic sleeve, such as a blue garbage bag with the base cut away. This accelerates ripening and encourages more even development of the whole bunch.

But be warned that leaving the base of the plastic bag intact will quickly lead to the whole bunch rotting off.

Frost and particularly cold snaps in winter have been known to cause the bunch to drop spontaneously from the plant. One means of insuring against a potential disaster of this type is to prop up the bunch with heavy timbers in a three-pronged teepee-style arrangement.

— *Neville Passmore*

[Q Ed: There is no commercial banana production in Perth, but local world banana expert, Dr David Turner, does not rule it out as a possibility.]

[*"Made in Australia" / 2003 May*]

Turning banana waste into profit

By converting banana plantation waste into paper, using an innovative Australian technique, Ramy Azer, of Papyrus Australia, is creating more jobs in banana harvesting and in paper production.

Banana fibre is an effective, low cost, strong, water-repellent, recyclable and ultimately biodegradable alternative to wood-pulp paper — the other alternatives are hemp, bagasse and straw pulp.

Banana paper is cost-effective, sustainable, and environmentally friendly. Its production even helps control fungal disease in banana plantations through removal of decomposing matter that can infect the remaining trees. The long-fibre banana paper technology uses no water and creates less chemical effluent and landfill. Based on ancient Egyptian techniques, the banana fibres are laid across each other in layers, so the paper is called, 'ply-paper'.

Papyrus Australia is creating international interest in its innovative techniques. Ecuador is the largest banana exporter in the world and, according to Ramy, its banana industry is well organised. But Ecuadorian banana producers have sent a representative to Ramy because they spend US\$3 billion a year importing waxed cardboard boxes in which to ship their bananas. If they could produce enough paper from their own banana plantation waste they could ship bananas in their own banana boxes at a much reduced cost.

'Paper is a generic product,' says Ramy, 'It goes into producing many thousands of different products — it is one of the basic materials. This broad market includes its use in panels in cars, as insulation and backing for tiles in building, etc, so the dilemma of marketing banana paper is really that we can't market our paper everywhere at the same time.'

Ramy is looking for sectors where his paper provides a competitive advantage because that is where they can command the highest price. 'Initially we have to pick a winning market, then move into other sectors. To start the business, we look for sectors that need low quantities of high-quality paper and are willing to pay a higher price; and then we'll move towards the higher volume, low-price, cost-competitive sector. Everyone wishes life was so easy!'

"When we first started developing banana paper," Ramy recalls, "we gained an AusIndustry grant to produce this new paper for the decorative, high-quality paper market. It changed to paper for building and packaging and we received our New Industries Development Program (NIDP) grant."

Some of the NIDP grant money went into a scientific demonstration pilot plant to tweak the technology and Ramy believes they are currently two stages away from their first commercial plant. Ramy's pilot factory is already creating product that is used in diverse market segments in Australia.

Banana paper is different to normal paper — it is even washable and sewable. At last year's Cairns Amateurs race meeting, for



*Ramy Azer of
Papyrus Australia*

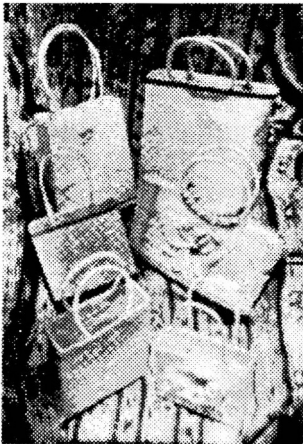
example, a model wore a skirt, top and hat with a matching bag — all made of banana paper. Given that no other paper can be turned into fashion, that is one sector where they have a competitive advantage — and they can sell it at the price of high-quality fabric.

In a sector at the other end of the market spectrum, cement bags are made of up to eight layers of wood-pulp-based kraft paper and a layer of plastic to carry the weight and protect the dry cement from moisture. Because banana paper is strong and water-repellent, cement manufacturers would need to use only one layer of paper, creating an instant savings ratio of 8:1. Another market with a competitive advantage.

The marketing importance of a story

"In those segments, we really have competitive advantage," states Ramy. "On the other hand, the novel look of the paper, and the fact that it has a story, gives us additional marketing value. Anita Roddick's Body Shop loves selling stuff with a story."

As an example of a story link: there is a company on Kangaroo Island, off South



Karla bags are among many items made from banana paper

Australia, that produces and exports herbal, organic and biodynamic tea. Their image is dependent on their market perception as producing the cleanest food. So they also need the cleanest, most environmentally-

sound packaging. While recycled paper is environmentally friendly, it is not perceived as being clean — banana paper is.

Professor Jack Garnett at the University of Western Sydney has even developed an oxygen-and chlorine-bleach-free process in which banana paper can be coated to create environmentally-friendly white office paper. This paper extends Papyrus Australia's product line and attracts a different market segment. Professor Garnett has found an environmentally-friendly way to coat and control the surface features of paper and still produce any colour, matt or glossy, using the fibrous base. 'The white paper demonstrates what we can do,' Ramy says.

Papyrus Australia is only producing samples at the moment because it does not have the infrastructure to produce enough for the market. "It is one of those situations where you can't start small and grow," Ramy says, "To be productive, we have to build a full-scale factory which will cost about \$3 million. In paper terms, that's a pittance — wood-pulp paper factories usually cost billions."

Transforming

Papyrus Australia works with, and owns 70 per cent of, another Queensland company called Transform Australia Pty Ltd. Transform was formed as a cooperative venture between Ramy's research and development team and Tom Johnston. Where Papyrus Australia's product is technology and machinery; Transform Australia will take the technology and machinery, turn it into paper products and find a market for them.

Ramy explains, 'It was Transform's job to take some samples, and find out who would pay the most. They started with the Queensland tourist market and printed Australian flora and fauna onto the banana sheets to sell to

tourists as limited edition prints. The hand-painted originals combine Aboriginal art and natural banana paper and are selling fast.'

Another marketing issue for Ramy is to sell the technology that turns banana plantation waste into paper around the world. "That's a totally different exercise," he says. The technology is applicable to sugar cane and coconut, palm oil and rubber tree palms. "We just wanted to produce beautiful papers for designers and craftspeople," Ramy says, "But other industries and markets approached and created a demand for other products."

Useful contacts

Papyrus Australia is located at Thebarton, South Australia,

Transform Australia Pty Ltd:
www.transformaustralia.com.au

University of Western Sydney:
www.uws.edu.au

[Q Ed: Another member of the Banana family known for its fibre uses is Manila Hemp, *Musa textilis*, originally used in 'Manila envelopes'. If you grow bananas in your garden, old dried banana-leaf stems are strong and flexible, ideal for tying trees to stakes etc.]

[Countryman Horticulture / 2003 May 1]

Hen army on patrol

Amberley viticulturist Phil Smith has found that the humble hen is a ruthless pest exterminator.

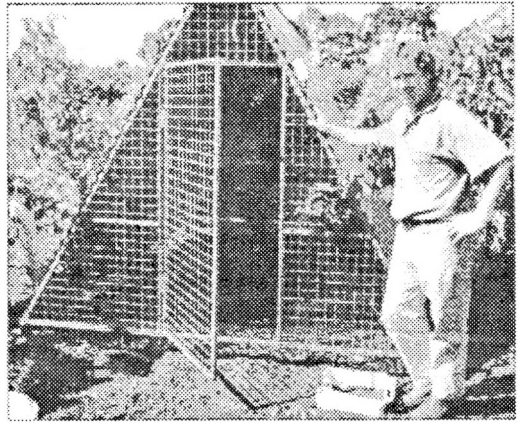
His army of fowls lives in three fully automated, movable hen houses and requires hardly any looking after.

A car battery hooked up to a timer and a car aerial opens the hen house door in the morning and closes it in the evening.

A water-filled drum at the back of the shed connected to a pipe with nipples provides water, and the hens forage for their own food during the day.

Mr Smith said the birds scratched around the vineyard gobbling up weevils in a low-cost entirely environmentally-friendly way.

Amberley buys chooks for \$1 each from a battery hen operation.



Phil Smith shows off the self opening and closing door on the automatic hen house

"It gives the chooks a whole new lease of life coming here," Mr Smith said.

He got the idea for the automated hen houses from Bevan Blakers in Manjimup.

Mr Blakers hasn't sprayed for insects in the six years he has had the chicken coops.

Hazelnut Varieties

Hazelbrook Nut Farm, Balingup WA

(Members of WANATCA)

PO Box 15, Subiaco WA 6008

Phone 08-9388 1121 (after hours).

[*Agroforestry News* / 2003 Apr]

Uses and nutritional benefits of chestnuts

Sweet chestnut was for centuries a staple food for generations of mountain people from France and Italy, and also constituted the food of rural populations who turned to it in times of famine and poverty.

Its wood was used to heat country dwellings, it provided tannin, litter and leaves for livestock, raw materials for buildings, pole production and items of daily use.

As it provided such a basic important food, it was for centuries known as the "tree of bread" and cultivation extended beyond its natural cultivation area, where it bore fruit due to careful tending of trees. As the cultivation gradually extended, it provided an alternative to cereals, as a food for the masses, thanks to the fact that it was easily available and easy to store. Later, thanks to its low cost

and high nutritional content, it became known as the "bread of the poor", providing energy and protein to the poorer people.

In past times in many mountain areas, the average diet was based on chestnuts for at least 4-6 months of the year, with consumption about 150 kg per person per year. In a self-sufficient economy, chestnut growers often planted different varieties to meet various requirements (for drying, for flour making and for fresh consumption).

Great creativity was used in inventing various ways of preparing the chestnuts:

Composition and nutritional value of chestnuts (per 100g product) according to usage

	fresh	dry	roasted	boiled	flour
Edible part %	81	100	82	88	100
Water %	52.9	10.1	42.4	63.3	11.4
Calories (kcal)	160	287	200	120	343
nutritional elements (g/100g)					
carbohydrates	34.0	57.8	39	24.4	63.6
sugars	9.6	16.1	10.7	7.5	23.6
starch	24.4	41.7	28.3	16.9	40
fibre	7.3	13.8	8.3	5.4	14.2
soluble fibre	0.6	1.1	0.7	0.6	1
insoluble fibre	6.7	12.7	7.6	4.8	13.2
proteins	3.2	6	3.7	2.5	6.1
fats (lipids)	1.8	3.4	2.4	1.3	3.7
minerals/vitamins (mg/100g)					
potassium	395	738			847
phosphorus	70	131			164
sulphur	48	126			126
magnesium	35				74
calcium	30	56			50
chloride	10	18.6			18
sodium	9	17			11
iron	1	1.9			3.2
manganese	0.7	1.3			1.3
copper	0.6	0.6			0.6
zinc		0.3			0.3
vitamin B1	0.1	0.2			0.2
vitamin B2	0.3	0.4			0.4
Vitamin PP	1.1	2.1			1
Vitamin C	23				
panthothenic acid	0.9				
phytic acid	50				

roasted or boiled in water of milk, and eaten, especially in the mountains, as a bread substitute; served hot with wine or milk in the form of a soup; ground and used as a cereal flour substitute for making polenta, porridge, flat breads, chestnut breads and thick soups.

Chestnut nutrition

Chestnuts meet the current demand of consumers, who are increasingly tending towards organic foods; from a nutritional point of view they are similar to rice or wheat. Unlike the majority of pulp fruits, the water content is around 50% in fresh chestnuts and 10% in dried chestnuts. Fresh chestnuts have a high calorie content (160 Kcal per 100 g), a good fibre content (7-8%), and excellent carbohydrate content (35%), a fair quality protein content, a low percentage of fats and a moderate percentage of minerals (especially potassium, and to a lesser degree calcium, sodium, and phosphorus). They also have a modest content of hydrosoluble vitamins (B1 and B2 in particular).

Carbohydrates: Chestnuts have a high carbohydrate content (sugars and starch) with about 26% starch and 9% sugars. Sucrose is the main sugar present (6.7 g per 100 g, more than in wheat, walnuts or potatoes), with small amounts of glucose, fructose and maltose. This starch:sugar split makes chestnuts an excellent energy source and ideal in conditions of physical and intellectual strain. Chestnut flour is an ideal alternative in the preparation of sweet products and soups for people with cereal intolerance.

Fibre: The fibre is mostly insoluble and is therefore not assimilated by the body. It does, though, play an important role in the function of the intestines and micro-flora and helps prevent gastrointestinal problems.

Protein: The protein content (about 3 g

per 100 g) is equivalent to that of milk, although substances which convert to gluten are absent, thus it can only be made into bread if mixed together with cereal or rye flour. The protein is of a high quality, containing essential amino acids (tryptophan, lysine, methionine, cystine) and is comparable to the protein content of eggs, considered ideal for amino-acid balance.

Fat: Unlike the majority of other nuts which are rich in fat, chestnuts are low in fats (about 2 g per 100 g). The fat content present is of high quality and chestnuts are in fact an important source of essential fatty acids, especially linoleic acid, which play an important role in the prevention of heart disease.

Minerals: There is a good potassium content (395 mg per 100 g average), which plays an important role in the function of the nervous system and membrane exchange.

Vitamins: Two important vitamins of the B group, riboflavin (Vit. B2) and nicotinic acid (Vit PP) are found in significant quantities. B vitamins are not destroyed by cooking. Smaller quantities of Vitamin B1 (thiamine) and Vitamin C are also present.

The nutritional content of chestnuts varies considerably according to the cooking and preparation methods used. When boiled, their water content increases and their energy value falls by about 25%; when roasted, the available sugars increase by over 25%, as well as their energy value, while their water content drops by 20%. Cooking alters the starch content, which is reduced on boiling, with a reduction in the potassium and magnesium content, but not in calcium, while the sucrose, fat and protein content are barely altered.

On drying, the protein content further increases to 5-6% (more than in potatoes — 2% — but less than other cereals — 10-12%),

the carbohydrate content also increases to around 60 g per 100 g of product, and the energy value also increases. Dried chestnuts have a modest sodium, B-group vitamins, iron, calcium and potassium content.

Conclusion

The demand for wholesome and organic food makes it now possible for a comeback for the chestnut in daily eating habits, free of connotations of poverty with which it has been linked for centuries. Dried chestnuts and chestnut flour are becoming increasingly popular for soups and polenta, and are being used to prepare tagliatelle, gnocchi and ravioli. Dried chestnuts are popular boiled whole and served with meats. Boiled or roasted they make an excellent side dish or salad ingredient.

Thanks to the high sugar content, for

centuries chestnuts have been used to make desserts and sweets such as marron glaces, mousse, soufflé, speciality pastries and ice creams. The trend now is for less elaborate desserts such as chestnut flour bread, fritters and milk-based puddings. Besides their delicious taste, chestnuts are an extremely versatile cooking ingredient which are also a very healthy and high energy, balanced and quality food.

— *Martin Crawford*

Reference

Bounous, G et al: *The chestnut: The ultimate energy source nutritional value and alimentary benefits*. Nucis-Newsletter, Number 9 (December 2000).

Agroforestry News: A2768.

WE ARE PLEASED TO INVITE YOU TO THE
**6TH INTERNATIONAL CONGRESS
ON HAZELNUT**

TO BE HELD IN TARRAGONA, SPAIN

14-18 JUNE, 2004.

Hazelnut (*Corylus avellana*) has been cultivated in the Tarragona district since the 13th Century, but commercial orchards came into their own at the end of the 19th Century.

Catalonia, in north-east Spain, leads the hazelnut industry, with about 25,000 ha under trees, producing some 20,000 t annually — 85% of the total Spanish crop.

Convener is **Joan Tous Marti**, IRTA-Centre de Mas Bové, Constantí (Apartat 415, 43280, Reus, Spain): joan.tous@irta.es.

Website: www.hazelnut2004.com

E-mail: secretariat@hazelnut2004.com

[Q Ed: Dr Joan Tous is a familiar visitor to WA, he gave papers on hazelnuts at ACO-TANC-2001 and has advised local growers on carobs and olives].



6TH INTERNATIONAL CONGRESS ON
HAZELNUT
Tarragona, Spain
June 14-18, 2004

[Sunday Times / 2003 Apr 13]

Leafy cactus yields unusual fruit

Miaflora Garden Centre in Inglewood has just been named the country's best small garden centre for 2002 and it is a deserving winner. Miaflora is a beautiful place with a wide range of plants, garden products and gifts, as well as a cafe and a beauty salon.

Owner Bruce Wright is passionate about his business and takes pride in providing a level of service you often don't receive these days.

The nursery is full of beautiful plants, and the attention to detail is reflected in the large range.

One of the weirdest plants in the nursery was a tropical-foliage cactus that looks nothing like a cactus. It's called the golden pereskia (*Pereskia aculeata*).

It is a gorgeous climbing plant with golden foliage when mature but which opens with a pink blush in its juvenile stages.

The leaves are large and fleshy, so this plant will cover a large area quickly.

It has small thorns that are not obvious to the eye but will catch the unsuspecting passerby, making it a good security plant.

It's one of the more brilliant hanging-basket plants because it can handle temperature extremes without stressing and dropping foliage like many hanging-basket plants do.

It requires considerably less water than most plants and can be used in full sun or shade.

— *Neville Passmore*

David Noel comment: I have a Pereskia in my yard, which has grown up a red-flowering gum and now hangs down like a curtain from this.

Like most cacti, Pereskias grow easily from cuttings, and I put a cutting in because



*A mass of flowers on the Pereskia
(see also the cover drawing)*

the plant does produce small reddish-yellow edible fruit, sometimes called Barbados Gooseberries.

My plant has fruited reasonably well for several years. The fruits are not very prominent and appear a few at a time, and I'd never really noticed the flowers..

So it was quite a surprise when, in March this year, I saw that the Pereskia curtain was ablaze with showy orange and white flowers (see photo).

It will be interesting to see whether this results in a large crop of fruit!

[Macadamia Newsletter (Shelterbelter) / 2003 Apr]

WA macadamia notes

Where are we going?

In WA we need to have a clear focus of where our industry is going and how we can best develop it. Unlike the majority in Queensland and NSW, we are, at the moment mainly comprised of plantings ranging from 100 trees up to 2-3000.

In Queensland and NSW the growers generally take their Nut-In-Shell to the processors (or the processor collects it from the farm) They are then paid the going rate, currently \$3-\$3.20 per kg. If you have 2 tonnes of NIS you will receive around \$6000.

From this you deduct your maintenance, harvesting, dehusking and transport costs of getting the NIS to the processor, and there is your gross profit. Your nett profit will depend on how you amortize your capital expenditure. The above example is equivalent to 200 trees bearing 10 kg each at \$3.00 per kg.

The more trees you have the more viable this option becomes (economies of scale etc). I am fully aware of the problem facing smaller growers with lower volume. A return of \$3 /kg is not over-exciting if you only have 100 kg.

Your other options are to sell dried NIS ready to crack and eat, crack the nuts and sell the kernel or value-add in some other way [ice cream, dipped, coated or roasted etc]. Assuming you have enough land and water, a planting of 400-500 trees is a viable number for a serious hobby. With this number you can earn a reasonable return by selling your nuts to the processor.

Summer deaths in 1st year trees

This summer has been long and hot, a real test for management of orchards. The macadamia, unlike many fruit trees, can have too much water if the soil has a good moisture holding capacity. We have had an experience

on one property this year where there have been too many deaths.

Last years planting on this property was successful and the majority of the trees are extremely healthy and 2 m tall x 1 m wide in some cases. However this year we had problems from January to March. The soil was tested from a dead tree site and was found to have Pythium root fungus. This is not dieback or Phytophthora but it has a similar effect. The main reason for this in my opinion is: The soil type where most of the deaths occurred was a heavy loam.

The rows with minimal deaths were in a better drained loam and although they were receiving the same amount of water as the worse affected rows, they were utilising it as it passed through the soil profile. The rows where the most deaths occurred were too wet due to the slower absorption of the water into

IT'S MACADAMIA TIME !! TREES

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Shelterbelter..
TREE PLANTING SYSTEMS
Australia

Phone: 08-9574 6163 • Fax: 08-9574 6031

Email: treebrick@bigpond.com.au

the soil.

I believe this is borne out by the fact that in the same row of the 2001 planting there were a few deaths from Phytophthora in the winter. This also is usually due to poorer drainage. Enough water is essential, too little is stressful, too much can be fatal. Trunk diameter is another possible factor. I would appreciate comments from anyone who can contribute to this subject from experiences encountered.

Eastern States summary

Crop results

Total NIS figures @33% Sound kernel recovery and 10% moisture (tonnes).

1999	33000
2000	29100
2001	34000
2002	29500
2003	34000

The drought on the East coast has had an effect on the overall crop. However this year

is predicted to be better and next year back on track. The current price being paid by the processors in Queensland/NSW is \$3 - 3.20 per kg NIS. The average over the last 10 years has been \$ 2.70 per kg.

I inspected some high density plantings, 5 m x 2 m, in Queensland. These are designed to increase the yield per ha rather than yield per tree. The varieties were mainly A series which tend to bear earlier than the Hawaiian varieties and are proven to have potential. The high density planting suits certain varieties and not others, depending on their growth habit.

There is also expected to be an optimum bearing lifespan which hasn't been determined yet. The main thing I found on my visit was that everyone is still learning — yes even the wise men from the east! Horticulture is a never-ending learning curve with innovations and improvements always being sought. The Macadamia industry is after all only about 30 years old in Australia. When we stop learning we've got a problem.

Cutting trials at Gidgegannup

We have been conducting trials with cuttings of certain A varieties in our nursery over the last 12 months and will continue to do so. They are harder to get established in the nursery but we are hoping they may be an alternative to grafted trees in WA in the future. Time will tell and I will keep you informed.

A4's are hungry

If you have A4's in your orchard be sure to give them more fertilizer than the other varieties. They are very vigorous and crop early so need to be well fed.

Anti-transpirant sprays

It has been found that anti-transpirant sprays are beneficial for frost and drought stress protection. The spray only needs to be applied at 1-2 month intervals when there is a

MACADAMIA TREES

Grafted, top quality trees from the Eastern States. Health-inspected by two state Agriculture Departments. More than 20 varieties available including all the top performing and newer varieties such as 816, 842, 849, A4, A16, A38, 781, 783, and Daddow etc.

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Pemberton Macadamias <A3260>

Iain Rankin, Ph/Fax 08-9776 1046 or

Margaret River Tree Planting and

Landcare Services <A3259>

David Rankin, Ph/Fax 08-9757 2547

PO Box 217 Margaret River 6285

risk of either of the above conditions. Contact me for more information.

— *John Cory*, Macadamia Services of WA. Phone 08-9574 6163, e-mail treebrick@bigpond.com.au.

[*West Australian / 2003 Mar 27*]

Macadamia: major oil of choice

Macadamia oil is fast becoming the choice of good oil lovers. Like olive oil it is rich in monosaturated fats (the good ones).

However, what has made this oil a little

[*West Australian / 2003 May 7*]

Italian award for WA oil

The first oil from a Dandaragan olive oil project has won an award in Italy.

Dandaragan Estate chief executive Geoff Newing said nothing special was done to prepare for the competition.

"We just took three bottles from the production line and submitted them," he said.

It was awarded a grand mention diploma at the Matri Oleari Golden Lion awards in

tricky is that many of the oils previously available were oxidised and so did not have a pure nut flavour. Brookfarm Oil, from Byron Bay in NSW, is producing fantastic oil that smells of pure macadamias. It also tastes great.

As well as the plain oil, it is also available infused with either lemon myrtle or lime and chilli. The oils are available at all good fresh markets or at The Grocer, in Nedlands.

Macadamia oil is set to become a major oil of choice and we know that heaps of trees have been planted in WA.

— *Margaret Johnson*

Verona, said to be the pinnacle of olive oil awards. The competition is sponsored by the Italian Ministry of Agriculture and run by Italian olive oil industry guild, the Matri Oleari.

The Dandaragan project has 215,000 trees planted on 385 ha in 2000. The first olives harvested in January last year produced 30,000 litres of oil crushed under contract at York.

Mr Newing said this year's harvest would be processed in a new \$1.5 million plant at Dandaragan, and 100,000 litres was expected.

At full production in 2007-08, the company expected two million litres, mainly for export.

Mr Newing said the award confirmed Australia's ability to produce high-quality oil.

"It puts our company firmly on the map of the world's quality olive oil producers, an important achievement as consumption of high-quality extra virgin olive oil continues to grow," he said.

— *Michael Zekulich*



Geoff Newing with bottles of the Wheatbelt olive oil which won an award in Italy. Picture: Greg Burke

[West Australian / 2003 May 10]

New fruitfly eradication advance — Flies ginger up sex life

Gingering up the sex life of sterile fruit flies could be a money saver in the battle to save fruit from damage. Breeding and distributing sterile male flies to disrupt the reproductive cycle has been such a success that WA now sells the sterile flies to South Australia for \$2500 per million.

The discovery by United States researchers that a touch of oil extracted from ginger made male flies irresistible to female flies means sterile flies are now more effective.

Agriculture Department senior entomologist Bill Woods said: "The application of ginger oil improves the sexual competitiveness of sterile medflies (sterile Mediterranean fruitflies) to the extent that they compete more effectively with wild flies in the search for mates.

"Researchers are unsure how it works but they know the males only need to get a sniff of it to become more sexually competitive."

Trials to prove the effectiveness of the discovery are being done at the department's South Perth laboratories by visiting entomologist Don McInnis, who did the initial work in the US.

Mr Woods said the use of the oil could result in considerable cost savings in the sterile insect fruit fly eradication program.

— Peter Trott



US researcher Don McInnes, left, and entomologist Don Woods work on ginging up the sex lives of fruit flies

[Countryman Horticulture / 2003 May 1]

Compost mulches outstanding: study

Concerns for the environment and increasing landfill waste, as well as improving agricultural efficiency, prompted a study on composted green organics for use in horticulture.

The study was supported by the South West Development Commission, the WA Department of Industry and Technology, CSIRO and Malatesta Green Organic Waste.

Field trials were established and monitored by

John Buckerfield and Katie Webster, of CSIRO/EcoResearch, and Bob Paulin, of the WA Department of Agriculture.

The South-West trials have clearly shown that compost mulches have significant benefits in horticulture, with improved plant growth and marked efficiencies in water and weed management. The studies complement other field trials which confirm the value of composts for commercial horticulture.

The comprehensive study monitored plant growth, soil moisture, water infiltration, earthworm activity, soil strength, grape yields, soil moisture and economics.

Through its distribution agent, Cowaramup Agencies, Malatesta's Green Organics has spread more than over 20,000 cubic metres of compost in the Cape region.

"Church View Estate recognised the need to implement a soil conditioner, once we determined that the base of our proposed winery comprised heavy gravel," said Spike Fokkema, of Church View Estate, Metricup.

"We applied Malatesta's compost to the ripped furrows and then added a further 50 mm capping of mulch once the vines had been planted.

"In just six months we have 90 per cent wire full. We attribute this growth to the ability of the mulch to retain nutrients which previously would have drained away. The growth and health of the vines has far exceeded our expectations."

Leonard Russell, of Watershed Premium Wines, Margaret River, said: "Watershed Premium Wines has applied Malatesta's mulch over 12.5 hectares".

"The mulch was applied in the autumn before planting 2000 to sandy and gravelly areas. The application was at 250 mm in width and depth of 50 mm. After two growing seasons there is still visual evidence of the mulch and more evidence of macro-organisms such as worms than in non mulched areas".

"Visual comparisons also indicate that mulched areas suppress weeds more than non-mulched areas. The advantage of the mulch is the large range of particle sizes and the different materials used to make up the product." **¥**

Tissue-culture dates available in WA

John Burt kindly passed on a copy of the following e-mail

Date: 27 Mar 2003. From: "Burt, John"
<jburt@agric.wa.gov.au>

To: 'Reilly Dave -dates'
<borunom@riverland.net.au>

Thank you for your letter, information and photograph. It is great to hear that at the end of the year tissue cultured plants will be available in Western Australia from your South Australian Riverland property for \$160 each, without all the problems of quarantine and establishing plants.

I have not had a request for dates in the last few months. Every so often, we have multi-national enquiries referring to large corporate developments, but these have all fizzled out. There are also occasional requests from pastoral stations.

The Gascoyne Junction development does not appear to be producing any dates, but has been operational for over 10 years. A planter in Carnarvon weaned some plants from tissue culture on his property more than 10 years ago, but considers there is too much labour in producing dates and none have been marketed.

Progress in date development so far has been poor in Western Australia, but now that people can readily buy Australian pest-free plants in small and large quantities, then we should be able to test the yields and quality of this crop in many more locations in this state.

There are vast areas of land in Western Australia, but much of the land in the north of the State is tied up in pastoral leases. Although the date has a higher salt tolerance than other plants, it still requires a good water supply. This is difficult to find in many northern areas. Any digital photographs of your plants would be of interest.

— **John Burt**, Development Officer,
Vegetables and Fruits, WA Dept Agriculture

[Permaculture Activist / 2003 Summer]

Nature always bats last:

Learning from Nature – Or Not

How do ecosystems work? Our efforts to manipulate them reveal our ignorance.

The continuing unravelling of GMO crop technology is just one example of our laughably poor understanding of how nature's webwork behaves. In addition to problems with pollen transfer to non-GMO plants, allergic reactions, and reduced yields, now a new drawback has been inscribed upon the lengthening list of GMO failings.

When their work began, Monsanto researchers cynically admitted that within 5 to 10 years rapid evolution of toxin-resistant insects would render their Bt-engineered crops (and the valuable organic pesticide Bt) useless. But Bt-tolerant insects have shown up ahead of schedule.

That's just the beginning: Research from Imperial College London and the Universidad Simon Rodrigues in Caracas, Venezuela shows that when Bt-resistant diamondback moth larvae eat Bt-engineered cabbage, they grow faster than when fed normal leaves. Far from being harmed by Bt, the larvae seem to be using the toxin as a nourishing protein source.

Nature always bats last

Whether it is Bt toxin, or the immense forces of withering sun, scouring rain, and blasting wind, the complex network that we call an ecosystem transmutes these seemingly destructive forces into hugs, blossoms, birds, and a nurturing home for all the diversity of life.

Nature has mastered the art of turning adversity into triumph, gale into zephyr, shit into beauty. And we have scarcely a clue as to how nature domesticates these wild sector energies and redirects them into growth and support.

The rapid evolution of ecosystem knowledge over the last 30 years shows how much we still have to learn. Many of permaculture's early precepts were based on 1970s ecology, and we've learned since how oversimplified – or just plain wrong they were.

One example is the idea that diversity yields stability. This concept seems to be floating around in the back of everyone's mind, colouring our worldview: We just *know* it's true. And yet, both sides of that equation are based on some unsupportable assumptions. Plain old species diversity of the Noah's ark kind offers few benefits. Many low-diversity ecosystems – saltgrass marshes, oligotrophic lakes, bacterial cultures – show surprising robustness in the face of disturbance. And adding new species to many ecosystems – increasing their diversity – blows them apart.

We know now that species richness may not shield *populations* from fluctuation or extinction, but the right kind of diversity – one in which the important roles are not only filled but redundantly so – often ensures that ecosystem *processes* will continue even as the component species boom, wobble, or crash.

Permaculture's later insight, that it's not the number of elements, it's the functional relationships among them that matters, rightly puts process before species. In addition, components need to operate at diverse rates and scales, so that forces and materials – large, small, and in between – can be damped, harvested, and turned into resources. This strategy also ensures that a disturbance at one scale – an insect pest, say – won't cause harm at any other scale. That's why a monoculture fails: it's all at one scale and rate.

The other side of the diversity/stability duplex is slippery, too. What is stability? In the last decades we've scotched the idea that an ecosystem marches in inexorable lockstep to some ideal climax phase where all is peace.

It's a jungle out there, with only the rarest patches of ground remaining the same for even a few years, with or without human intervention. Very little holds still: nature is in a dynamic, swirling non-equilibrium state, for which the word "stable" seems singularly inappropriate.

Yet all is not chaos processes cycle in hard-to-break patterns and recognizable rhythms. We loosely intone "stable" because *something* stays constant, but when we observe carefully, this constancy seems to disappear: Species change, plants grow, energy flows shift, nutrients vary: What remains stable? Let us unpack this too-broad word and see what we mean by it.

Ecologists have deconstructed "stability" in many ways. We could mean *resilience*, defined as the ability of an ecosystem to continue functioning after a disturbance. There is *persistence*, the survival time of a system or some component. We can use *elasticity*, how speedily the system springs back to its old self after a shock. Another is *inertia*, its resistance to external shoving. *Amplitude* describes how far the system can be displaced and still return to the initial state. Some ecosystems are cyclically stable: They circle around some central set of conditions. And then there is trajectory stability, continuing toward an end state despite disturbance or different starting conditions.

Each of these qualities denotes that something holds, yet each is subtly and importantly different. So when permaculturists talk about creating stable ecosystems and permanent communities, we know we don't really mean unchanging, invariant places. These careful distinctions around the word "stable" will let us plan for the real dynamics of our design: It's going to change, so how can we help it do that in a smooth trajectory?

– Toby Hemenway

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CALENDAR OF FORTHCOMING EVENTS

(See also www.AOI.com.au/wanatca/Events)

Deadline for next issue: Jul 20

2003

- Jun 17 Tue * **Wanatca General Meeting: Joe Tamaliunas - "Novel methods in propagating unusual fruits & nuts". Note: at Men of the Trees, Hazelmere near Midland.**
- Jul 21 Tue Wanatca Executive Committee Meeting
- Aug 26-28 • Dowerin Agricultural Field Days
- Sep 20 Fri • Karragullen Horticulture Field day
- Sep 29-Oct 4 § Second International Macadamia Symposium, Tweed Heads, NSW, Australia.

2004

- Jun 14-18 § 6th International Congress on Hazelnut, Tarragona, Spain.
- Sep 20-24 **Acotanc-2004, Gatton, Queensland**

*General Meetings are held starting at 7.30pm. Venue: As noted in each case.

These meetings usually include a display of current world tree-crop magazines for sale.

• Event with WANATCA participation; § Refer to news item in this issue of *Quandong*.

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

Current Subscription Rate: \$60.00 per year

(includes all publications for four consecutive quarters). Student Rate: \$30.00

Quandong is produced by the Tree Crops Centre, PO Box 27, Subiaco, WA 6008. Phone: 08-9381 7341. This issue edited by David Noël. WANATCA contacts: Phone 08-9250 1888.

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Quandong Advertising Rates: Whole page. \$100; Half page. \$60; Quarter page. \$35; Eighth page. \$20. 20% discount for 4 insertions.