Quandong

magazine of the

West Australian Nut & Tree Crop Association (Inc)

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THE MAMMEY APPLE (*Mammea americana)*

NEXT MEETING: MEN OF THE TREES

Our speaker at the next meeting will be **Barrie Oldfield,** who is President of The Men of The Trees in Western Australia. Barrie will be talking on

Crop Trees in 'Men of the Trees' Planting Activities

Barrie works 25 hours a day, 8 days a week in promoting the planting of trees, particularly in community-based projects. This year he has already overseen the planting of over 100,000 trees in W.A., with activities such as Ribbons of Green, Arbor Day, and other projects in conjunction with groups such as Greening Australia and WANATCA.

Most of these trees are principally intended for environmental improvement, but Barrie always has an eye out for species with useful or saleable products. Examples are the Paulownias being raised at Men of The Trees' nursery at St Barbe Grove, the use of fruit and nut trees in the demonstration block and in farm-based plantings in the bush, and various plantings of carob trees.

Basically, Barrie's attitude is, "you raise 'em, I'll plant 'em!", and if the Association can encourage the raising of crop trees, Barrie and his army of community-minded volunteers will surely find a good home for them. But come along to the meeting and hear his eminently practical comments and advice. Admission is free and interested public are very welcome.

Time: Wednesday August 16, 7.30 pm

Venue: Naturalists' Hall, 63 Meriwa St, Nedlands

WANATCA at the Royal Show

This year's Royal Show will see the Association strongly represented. We intend to have a manned display in the Horticultural Pavilion.

This will show working pecan nut cracking machinery (kindly lent by Amos Machlin), a video on pecan harvesting, and a display of book titles from Granny Smith. We expect to be placing information hand-outs in the Yellow Brick Road showbag. We also expect to be accommodating a display on carobs from Henry Esbenshade.

The pecan video was specially prepared at our suggestion by the W.A. Department of Agriculture. Many grateful thanks are due to Eric Lawson and his team at the Information Branch. At a later date we hope to have copies of the video available for distribution.

The Show runs from September 30 to October 7, at the Showground in Claremont. Our participation is being organized by Alex Hart. If anyone is able to put in a couple of hours of work to help out here, would they please volunteer to Alex on 490 1324.

[Fruit Gardener (California Rare Fruit Growers)/1988 Qtr 4]

Avocados for Cold Climates

Because I am listed by CRFG as the avocado specialist, I get requests for information, especially about growing avocados in colder climates. Multiple letters are from the Mid-West.

Here's a brief answer to the most frequent questions received.

Variety selection is most important. Of the three races of avocados, the Mexican are the most cold-hardy. Guatemalan are next, and the least cold-hardy are the West Indian.

Mexican avocados in commercial production are mainly Zutano, with a small amount of Bacon, Jim, Santana, etc. Tolerating a little more cold, but of no commercial value are Mexicola and Jama, which are small with large seeds. Zutano is large with a large seed, and achieves best quality in February, after which it often splits or develops a "corky" spot on the blossom end. There are various cultivars of Mexicola, some better than others, but all have large seeds. The early ripening (late fall) is an advantage to get off fruit before the coldest weather occurs. Many Mexican field workers greatly prize the black-skinned Mexican avocados. One of the best of these is Stewart, which is fall-ripening.

Fuerte is believed to be a hybrid of Mexican and Gutatemalan types, and is intermediate in cold-hardiness. In addition large mature trees usually are spreading rather than tall (as are most Mexican varieties like Zutano). The spreading dense foliage of Fuerte tends to protect the tree, limiting damage to the outer foliage and protecting the trunk and large scaffold limbs. Fuerte is unsurpassed in quality with a thin skin. Its season is December through May in San Diego County.

The rootstock seems to be of no importance in cold tolerance as far as I have observed, having grown Hass seedlings beside Hass on Topa Topa rootstock, with no difference in survival after a freeze.

Cold protection offers many possibilities. Some are:

- Heating cables, wrapped around the trunk and major limbs, or 250V heat lamps.
- Shade-cloth enclosures on a framework, which may be left in place during three or four cold months.
- Pipe insulation on the trunk of the young tree. This is better than fiberglas insulation, which holds water on the trunk.

Recovery after a freeze, if the trunk is saved, is rapid; usually two years are required. Hass trees, frozen to the ground for me, have regrown above the graft, forming a multi-trunk tree if unpruned, which results in dense foliage at ground level protecting the trunk. Trees surrounded by other trees, so that foliage is adjacent on two sides, are less damaged than stand-alone trees. Trees adjacent to a heated house get some protection.

Varieties for the best quality, in my opinion, in addition to Fuerte, are Hass for summer fruit, and Pinkerton for winter fruit; both will tolerate 28 Degrees for some hours with small damage. The temperature that Mexicola and Zutano will survive depends on many things such as duration, and factors mentioned above. In most locations around 20 Degrees may be the lower limit. Sunset's New Western Garden Book lists the lowest temperature ever recorded for all zones in the West. Major freezes occur about every ten years in San Diego County, but two successive freezes occurred in 1986-1987 and 1987-1988.

— ***Robert W. Fitzpatrick***

(I am unable to supply trees or scion wood).

PISTAG BULLETIN

Working with the PGAI

Our Association aims to work in close cooperation with sister organizations active in other places or which specialize in particular tree crops. We have been asked by the Pistachio Growers Association Inc. for help in surveying pistachio plantings.

If you have any plantings of pistachios, please contact Christine or me so I can take down the answers to a few simple questions for their survey. If you are serious about pistachios, you should consider joining the PGAI. The cost is $30/year, and the Secretary's address is PO Box 34, Paringa, SA 5340. Subscriptions are terrific value for money — I have been a member for some years, and think the PGAI Newsletter is vital information for this very promising but competitive new industry. Do contact us if you would like to follow this up.

By the time you read this, the PGAI will have had their 1989 Information Seminar, held at Tooleybac, on the NSW side of the Murray near Swan Hill. I hope to report on this in the next Pistag Bulletin.

Finally: this time of year, all your trees should have lost their leaves. Did you remember to do the leaf analysis to determine any nutrient deficiencies? Have you prepared your tree lines for the new plantings? Do you know know the difference between a fruit and a vegetative bud? All this, and more, in future Bulletins....

— ***Tom Bateman***

Pistachio Salinity Research Project

At the instigation of the Association's Executive, a submission has been made for a grant from the Federal Government's National Soil Conservation Program for a project entitled "Pistachio Varieties — Saline Land Reclamation".

Here are some extracts from the submission:

Salinization of agricultural soils is an Australia-wide problem, but Western Australia is an especially bad sufferer from this malady. The problem is already at major proportions in this State, and in spite of increasing counter-measures, the problem continues to grow.

The plant family Pistaciaceae, of which the best-known member is the Pistachio Nut, *Pistacia vera*, is notable for its ability to withstand both salty soil conditions and drought. The aim of the present project is to develop suitable *Pistacia* species and varieties with a dual purpose — to grow well under saline-soil conditions and allow reclamation of those saline lands, and to establish trees on these lands which have some prospects of providing cropping capabilities and hence economic returns for the farmers involved.

The only major economic product from the family is the nut from *P. vera*, however there are other products, in particular resins from the wood and oils from the seeds, which have economic value and hence potential for modern commercial development. The family is very widespread, ranging across from China

through central Asia, the Middle East, North Africa and the Mediterranean, and across the Atlantic to Texas and Mexico.

All the nut-bearing clones have been selected from a relatively small area of the Middle East, principally from Iran, or are descendants of these selections. Because of limitations of *P. vera* as a rootstock, it is customary in modern plantings to graft these fruiting clones on rootstocks of other species. The main species used has been *P. atlantica*, although in recent years *P. terebinthus* has achieved some favour. Although these rootstocks have been drawn from a somewhat wider field than the fruiting clones, the provenances involved (and hence suitability to match particular field conditions) still represent only a small fraction of the available genetic stock of some 20 species extending over a very varied spectrum of provenances.

The objective of the present project is to obtain seed of pistachio species from as wide as possible a range of world sources, to raise large numbers of trees from this seed, to plant these trees over a large number of representative sites of salt-affected land in the State, and to monitor these plantings to derive effective information on their ability to thrive under the various environments and their potential for cropping for nuts, resins, oils, and any other possibly saleable products.

This is a joint project involving many local organizations from the grass-roots level up. Commitments to support the project in practical terms through the supply of land, labour, fencing, planting, and tree maintenance have already been obtained from these organizations. Support is sought from the NSCP in terms of funding for 3 elements of the Project: raising of seedlings; project supervision, monitoring, and dissemination of results; costs in obtaining seed.

As trees are by definition longer-lived plant species, projects based on the development of tree resources are themselves necessarily of a longer-term nature. Nevertheless, it is anticipated that the principal objective, that of identifying *Pistacia* provenances capable of thriving under various conditions of soil salinization, can be attained over a 5-year cycle.

The natural follow-up to the successful attainment of this objective would be to develop techniques for the widespread propagation, planting, and establishment of the favoured clones or races. This would not form part of the present project. Nevertheless, information gathered during the present project should form a valuable basis for this later development.

Work is currently being carried out on the evaluation of fruiting clonal pistachio nut varieties, e.g. at the Stoneville Research Station of the W.A. Department of Agriculture and by members of the Pistachio Growers Association Australia (predominantly in South Australia, Victoria, New South Wales, and Western Australia). The present project should yield information on appropriate rootstock varieties to use with these fruiting varieties.

Most local organizations with expertise in this area are involved:.

ORGANIZATIONS

Tree Crops Centre	Project management; Seed procurement
Contractor	Raising of Seedlings
Men of the Trees	Distribution and planting
Land Management Society	Land preparation, fencing, maintenance
WISALTS	Land preparation, fencing, maintenance
WANATCA	Administration, liaison
Greening Australia	Publicity/ Public relations

On Planting Pistachio Trees

Pistachios are beautiful, productive, hardy trees and the time to plant them is fast approaching.

SITE SELECTION

Pistachios are not fussy being naturally tolerant of pH and thin soil however, the better the soil, the higher the yield potential.

We have found they can grow well in rocky sites but this does give rise to cultivation problems later.

Ideally, you should do a soil test to find any deficiencies in elements and obtain fertilizer advice.

Good drainage is essential. Pistachios will not tolerate wet feet for long periods. Valley sites give greater chilling hours, which is advantageous.

Exposed windy sites are not a problem and windchill may be helpfull.

PLANTING TIME

April to October, but late May to early August is better and extra care may be required in poor sites and at either end of this period.

SITE PREPARATION

Ideally the site should be ripped by a bulldozer for large plantings and a pre-emergent herbicide used to suppress early, competing weed growth.

For smaller plantings, dig a hole (at least) a bit deeper and twice as wide as the tree bag. If this is too labour intensive, hire a bobcat, backhoe or use a tractor mullboard plow.

If using a posthole digger, break the smooth sides of the hole with a spade or the tree may "drown" due to poor drainage.

Create a saucer shaped depression around the tree.

Place the holes a minimum of 5 metres by 5 metres apart in a diamond or square pattern.

To control weeds which compete for light, water and fertilizer, with your seedling you can use weed mats of old underfelt/carpet squares or Roundup herbicide. (Caution!

— ***Tom Bateman***)

BUYING TREES

To buy trees, or for further information, contact Tom or Christine Bateman on 09-401 8138 or at 4 Lygnern Crescent Kallaroo WA 6025

Should you be in the Yearbook Useful Addresses?

Each WANATCA Yearbook has a Directory of Nurseries and Commercial Sources. We urge all members involved with a nursery or other commercial service of use to members to contact the Tree Crops Centre so that their services can be listed.

Individual members are often entered under their own names, and we do not know about their commercial services, or about their speciailities. Help us to help others by getting your services listed. Entry in the Directory is free.

[Australian Pistachio News/1989 July]

Salinity Research

Recent Pistachio research at Merbein has focussed on glasshouse investigations concerning the effects of rootzone salinity on growth and salt accumulation by young pistachio trees.

This work has been conducted by Dr. R.R. Walker and a visiting research fellow from Iran, Dr. M.H. Behboudian. My research in this area has involved surveying field trials for salt accumulation by established trees.

The general conclusion from the glasshouse studies is that pistachio trees are glycophytes highly tolerant of salt. In short-term experiments (Behboudian et al., 1986), the photosynthetic rates of mature leaves on young Kerman trees were not affected by rootzone salinities up to 225 mM chloride (Murray River water in irrigation districts generally ranges between 1 and 8 mM chloride).

Such a degree of resilience has not been observed in any of the woody perennial horticultural plants for which photosynthesis has been measured under salt stress, e.g. grapevine, guava and citrus. These mature leaves were able to maintain photosynthesis in spite of accumulating reasonably high levels of sodium and chloride (Behboudian et at., 1986).

Shoot growth rates of seedlings of Pistacia vera and P. atlantica were not affected when grown in pots irrigated with a salt solution of 30 mM NaCl - about 10 times the average salinity of riverwater at Merbein (Walker et al., 1987). In another experiment, short-term exposure to salinities of up to 150 mM chloride and 90 mM sodium had no effect on dry matter production of P. atlantica and P. terebinthus seedlings.

Leaf chloride concentrations increased in both species as the level of salinity increased. After 15 weeks of salt trreatment, leaf chloride concentrations were around 0.5% for P. atlantica and 0.8% for P. terebinthus seedlings (Walker et al., 1987). Long-term exposure to salinities near 150 mM chloride is however known to cause a reduction in dry matter production (Sepaskhah et al., 1985). Future work will be aimed at testing the salt tolerance of pistachios under saline field conditions.

Surveys of two trials, at Merbein in 1986, '87 and Loxton in 1987, have shown that leaf chloride levels of pistachio trees are low. Mean leaf chloride concentrations for a range of scions grafted to either P. atlantica or P. terebinthus stocks have not exceeded 0.4%. This suggests that the salinity of Murray water used in irrigation should have little or no detrimental effect on the growth and performance of pistachios in the Murray Valley.

Future field studies will however provide further information to either substantiate or refute this. Chloride was higher in leaves of trees on P. terebinthus stocks, but this was only marginally so. There was also a variation between scion varieties for leaf chloride concentrations, but again this was only slight and is really only of academic interest.

—S.R. Sykes

(CSIRO Division of Horticultural Research, Merbein, Vic., 3505).

Welcome to Jan Correa from Chile

WANATCA is delighted to welcome a valuable new member, Jan Correa, from Chile.

Jan runs a seed supply service, and has offered to supply members with a range of useful and underexploited fruit and tree crop seeds from Chile. This west-coast country, covering much of the same latitudes as Western Australia, is a treasure-house of useful material for tree croppers.

Jan has agreed to supply information on useful Chilean plants (for example, see box) and to work with WANATCA in research projects, such as soil inoculants for Avellano (Chile Hazel) and seed collection of local cherimoya varieties.

Jan and his wife actually live on Easter Island, but he operates the seed supply service from the Chilean capital, Santiago. His address is given in the advertisement on this page. The Tree Crops Centre intends to maintain an up-to-date copy of his seed list for reference.

CHILE SNIPPET

Geoffroea decorticans

(Leguminosae)

This is an arid-zone tree from North Chile, also found in Peru, Bolivia, Argentina, Uruguay, and Paraguay. A small, deciduous, highly drought-resistant tree that produces an edible fruit with a dryish, sweet chocolate-nougat flavour. Used to make sweets, alcoholic drinks and a highly recommended medicine for asthma sufferers. Dried fruit stores well.

Seed sent to WANATCA is a mixture of cleaned seed and dried fruit, so that both can be tried for planting. No information about seed treatment or germination has been located yet.

USEFUL TREE SEEDS FROM CHILE

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

Contact **Jan Correa** for list at:

Casilla 53027, Correo Central, Santiago 1, Chile

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[The West Australian Tuesday July 12 1988]

Salinity a farming disaster - MPs

A major parliamentary inquiry has found that whole farming communities could be wiped out, water supplies destroyed and hundreds of millions of dollars in agricultural exports lost as salinity overtakes WA's rural areas.

The Legislative Council's select committee on salinity reported yesterday that, unless the situation was reversed, large parts of WA's agricultural areas could be turned into salt-affected wasteland within the next 20 years.

Its chairman, Liberal MLC David Wordsworth, said the committee was shocked at the situation.

"Without doubt, salinity is the most serious environmental problem facing the State today," he said.

"If we are to continue to maintain a civilisation here we have to reverse this process."

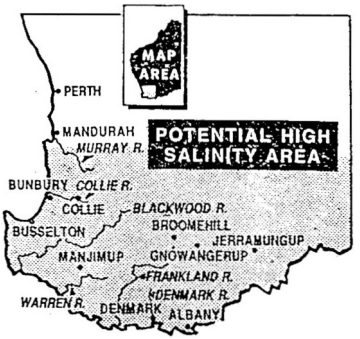
The committee's recommendations include:

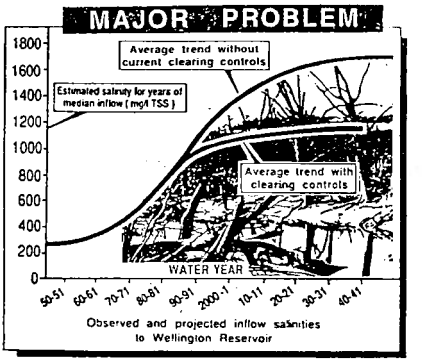
• Development of a long-term strategy for salinity control.

• Substantial additional Government funding over the next 10 years for salinity control.

• Establishing a salinity control board and an overseeing Cabinet subcommittee.

• Setting up a community education programme.





• An extended salinity loans scheme for farmers, along with a grants scheme and

Government buy-back scheme for further purchases of private land in sensitive areas.

A discussion paper prepared by the committee says the productivity of farm land is falling, trees are dying, river systems are being polluted and water resources for drinking and recreation are being spoilt.

"These are just the physical manifestations. The rural and urban communities will suffer greatly if our land resources decay further," it says.

The paper says the total cost of salinity to WA is about $75 million per year. The gross value of lost agriculture production is estimated at $44 million a year.

It says some shires have reported 10 per cent of their land was already useless for crops - others were losing 1 per cent a year.

"Other communities are expected to be wiped out through their agriculture becoming unviable," the paper says.

[From: Nut growing in Illinois (INGA)]

THE JUJUBE

The jujube, though probably native to Syria, is commonly called the Chinese date. It is one of China's favorite fruits, and orchards of hundreds of acres have been reported by USDA plant explorers working in that country.

The tree was first imported into Europe about the beginning of the Christian era, and soon spread to the countries bordering the Mediterranean. It was introduced into the United States in 1837, an orchard of the trees being planted at Beaufort, NC. Later, in 1876, trees from southern France were planted in the Sonoma Valley of California, and these trees are the source for most American jujubes.

The jujube, Zizyphus jujuba Mill, belongs to the Buckhorn family, the Phanmaceae. Most kinds have the thorns typical of the family, though the stickers are few or nonexistent on some varieties. The tree reaches 30 feet under favorable conditions. The prickly branches droop, especially in Autumn when loaded with fruit. Branches of all varieties are slender-branched and pliable, densely clothed with bright, glossy-green leaves borne alternately along the stems. The leaves are about 3 inches long, and somewhat resemble citrus leaves. Older trees send up suckers to some extent, but these are easily kept under control in cultivated areas.

Flowering begins in April or May, depending on climate zone, and a few flowers may appear off and on all summer. The greenish-white flowers are small and inconspicuous, and are not affected by the late spring frosts. The flowers are followed by fruits resembling the common date in shape and coloring. The shiny, parchment-like, reddish-brown to black skin, covers a mild, sweet flesh much like that of an apple when eaten fresh. The fruit makes good jam and preserves, and when dried, looks and tastes much like a date.

The fruit ripens in September and October and the trees will show fruits in all stages of ripening during that time. Young grafted trees begin bearing 2 to 3 years after planting, and bear regularly each year. They will not thrive or ripen their fruit well in areas where summer temperatures are low, or the summers are short.

The Jujube date prefers alkaline soil, and is best adapted to semi-desert conditions. It will grow anywhere as long as it has good drainage and full sun to mature its fruit. Neither insects nor disease seem to bother it and it doesn't require the spray schedule necessary for most fruit trees. It may be susceptible to trunk borers.

Jujubes are commonly propagated by seeds and offsets. Offsets should be separated from the mother tree one year before digging for good survival. Seeds should be cleaned and stratified, and cracking the hard seed before planting will often hasten germination. Usually seedlings are used only as root stock on which improved varieties are whip-grafted. Varieties are easy to graft, and only budwood of large-fruited varieties should be used. Seedling jujubes will outproduce named types, but the fruit is very small and tasteless.

When buying jujube trees or grafts, insist on the Chinese varieties. The fruit from the Indian, Arabian and European varieties never

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****

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reaches the size and flavor of the choice chinese selections. Two varieties are preferred in the United States; the Lang and the Li. The Lang has large, rather pearshaped fruit, 1 1/2 to 2 inches in diameter. The round Li fruits are about 2 inches in diameter, and have very small seeds. Earlier ripening selections are scheduled to be available in the future from the USDA Plant Introduction Stations. Most varieties are self fertile.

Planting can be done either in spring or fall, depending on climate scene. The nursery supplying the tree will ship it at the proper planting time for your area. Jujubes have big, heavy root systems which help them gather moisture to survive drought. Prepare a planting hole of sufficient size, working in compost and lime if our soil is acid.

Feed the tree in late winter before the buds begin to swell. Use ordinary orchard fertilizer, using an apple tree schedule, regular feeding will enable the tree to develop and mature a full crop of fruit each year.

Plant the tree anywhere you want a medium-sized ornamental tree. It's an excellent lawn tree; it lives many years, and its lacy foliage doesn't interfere with the growth of grass. Its handsome foliage goes well with lawns and shrubbery, giving almost an ever-green effect with its glossy leaves.

The largest jujube in Illinois stands before the National Guard Armory in Cairo, across the street from three of the largest pawpaw trees in the state.

FIGAG BULLETIN

The Fig Action Group is up and running. Member Judy Monks has kindly offered to talk about figs at our November meeting (see calendar). I have had contact with others interested in figs, and some of the correspondance is extracted below.

I am in the process of compiling an information leaflet on the Fig, which the Association will publish for FIGAG. Anybody with local information to offer, or wanting to point out matters which should be included, please contact me on 490 1324 or at the address on the back page.

— Alex Hart

From Evan Gwynne

I know of one or two nice figs around. The best I have come across is "Dianna". It's at Stoneville Research Station where I worked for a number of years. There are others there also, probably 8 varieties in all. You may know of them anyway.

Briefly, Dianna: mid season, large pale cream/yellow, flatish, colourless flesh almost seedless. Excellent table jam.

3 Calmyrna Strains: similar to Dianna in many ways, all lack size and quality compared to Dianna.

Panache: a variegated fruit green/yellow, ornamental, red flesh, seedy.

All other varieties there are inferior. They were brought in from the USA in mid 1970s.

My parents have a nice yellow fig, matures late February. Also I know of a tree in Carlisle, if it is still there, called Spanish Delight. A soft pink colour, flat, medium to large red flesh, seedy.

Try these people, Charlie Wood of Kalamunda (293-2926) (an old buddy), Lance Morgan, Midland Agriculture, Terry Muller, Gascoyne Research Station, Carnarvon.

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Reply from Alex Hart

Yes, I have seen the varieties at Stoneville and it was them that prompted me to have a further closer look at the varieties available nowadays, seeing that alternative crops are being "revived" as it were. Personally, I think figs are a fantastic fruit which are not persevered with although possibly pests may have something to do with this or the high labour input of harvesting and treating, etc.

A Mrs Judy Monks of Roleystone will be interested in your data as she is setting up a fig orchard using Stoneville Stock. Maybe you have met.

WANATCA AT DALWALLINU OPEN DAY

The Association was ably represented by Milan Mirkovic at a tree-oriented Open Day held at Dalwallinu District High School on June 16.

The theme of the Open Day was trees — as crops, in soil conservation and the environment, climatic effects, growing and planting, money from trees, etc.

Many organizations, including CALM, the Aggie, and Men of the Trees took part, as well as us. Our thanks to Milan for all his efforts here.

Warren Chislett takes up Life Membership

The Association is delighted to welcome long-time member Warren Chislett to Life Membership. Warren, who is member No. 98 (current numbers are around 1400) is listed in the first Yearbook of the West Australian Nutgrowing Society (our former name), which was published in 1975, and in every Yearbook since.

He farms a 20-acre property in lower central New South Wales, near Orange. Although he is growing nut trees, much of the property has poor eroded soil and Warren has put considerable effort into soil conservation practices.

Warren is the first member of WANATCA to take up the option of life membership by subscription, since this option was introduced two years ago. The Association has now been in existence for 15 years, and regards this payment of the Life Membership fee of $500 as a real vote of confidence in the future and value of the Association. Thanks, Warren.

WANTED !!!!!

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[Fruit Gardener (California Rare Fruit Growers)/1987 Qtr 3]

An Alternative Method for Cherimoya Flower Pollination

This method was first demonstrated to me by Crafton Clift, a guest lecturer from Florida who spoke to the San Diego chapter of CRFG last summer. This technique is routinely used in Florida, according to Crafton, so I decided to try it this spring on my cherimoya tree, a Spain variety.

The flower to be pollinated must be in the female stage with the flower petals slightly opened. The time of the day does not seem to matter so each person will have to determine when the stigmas of the flowers on his or her particular tree are most sticky. The stickiness of the stigma, though, may not determine whether or not the pollination will be successful.

The flower is tilted to a horizontal position and the petal on top in this position is removed by lifting it up and breaking it off at the base where it is attached. This will reveal a section of stamens bearing the pollen that will be used to pollinate this flower.

With the base of the petal just removed gently tease some of the anthers (i.e., pollen) loose from the flower, taking care to keep the anthers on the flower. I then use the pointed end of the petal to move the anthers to the stigma.

Some of the anthers are pushed under the two remaining petals and the rest is left on the exposed part of the stigma. If the stigma is not very sticky, the contact provided by petals holding the pollen next to the stigma appears to do the job.

The pollen of this flower is immature at this time, so the pollination will not occur until the next day. Evidently the maturation of the pollen is not dependent on its being attached to the flower.

Paul Phillips of La Mesa tried this technique on his tree last year with much success, but the amount of self-pollination that also occurred last year made it difficult to judge the success rate of this technique. This spring on my tree I used this technique with 60 flowers and had 21 take. I have been told by several sources that the first flowers to open usually do not take, so my success rate could have been much bettter if the first twenty or so flowers attempted are not counted in the tabulation. If the petal is too clumsy to use, possibly a toothpick could be used to dislodge the stamens and spread them around.

— ***Bob Holzinger***, San Diego.

Bob Holzinger's report, in the Third Quarter 1987 Fruit Gardener, on Crafton Clift's way of pollinating cherimoya caused one CRFG member to suggest that Crafton "be awarded a Nobel prize, purple heart or presidential citation because it works absolutely great". In his letter, Joseph Marconi, 428 S. Jensen Road, Vestal, New York 13950, goes on to explain:

"I have a small rare fruit tree conservatory in upper New York State and one of my trees is a Cherimoya, ten years old with a 5" trunk. I've been able to pollinate in the conventional method with limited success. A few fruit each year, the past four years.

I tried the alternate method and here are the results. So far I have about 20 fruit sets out of

about 26 tries. And, what was amazing was that I got fruit sets high up, on thick and thin branches, near the trunk and out on the end of branches.

I did it clumsily at first but later developed a handy tool by sanding and reshaping the rubber eraser end of an ordinary pencil to a chisel shape. I got a great ratio of fruit set. The resiliency of the rubber is enough to prevent injury to the stigma surface yet firm enough to dislodge the anthers.

Please pass this information along to other members. It may be helpful."

New List from Phoenix Seeds

The 89/90 Seed List is now available from Phoenix Seeds. This is a good source of useful and unusual seeds at reasonable prices.

This year's list has a major emphasis on fruiting trees and shrubs. Copies are obtainable free from Phoenix seeds, PO Box 9, Stanley, TAS 7331 (phone 004-581105).

David Noel publishes new book

August 6, 1989 is the date of first public release of David Noel's new book ***NUTEERIAT: Nut Trees, the Expanding Earth, Rottnest Island, and All That...***

The book, published at $19.95 by Cornucopia Press, is available from Granny Smith's Bookshop.

If you are lucky, there may be voucher still left in this issue of *Quandong* for you to get a copy free of postage and handling costs, anywhere in the world.

We hope to include a review of this book in the next issue of *Quandong*.

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We look forward to hearing from you.

[From: Nut Growing in Illinois (INGA)]

The Asimina

The Asimina (*Asimina triloba*), in the U.S. called the Papaw or American Banana, is a wild fruit in the woods of Illinois, but perhaps more prevalent in adjacent states. Seeds (must be kept moist) can be planted in vermiculite and a young seedling transplanted to a permanent site, then grafted with selected fruiting varieties.

Large groves can build up in the woods from suckering of one original seedling, but often fail to be fruitful. Studies at Urbana show cross-pollination to be necessary in order to have fruit development, and bees are not the pollinating insects for this species. Flies from carrion are one of the pollinating insects.

The most favorable planting sites seem to be in loamy soil, north or east of a building or large tree that will give partial shade. Fruits, somewhat like a banana with seeds, ripen from late August to early October. Some people are allergic to the foliage and skins.

Overleese (from Rushville, Indiana) is the most favored variety in recent mid-western grafting. It has good size, fine texture and delicate flavor, ripens early. Like the other varieties, it is not available from nurseries, but scions are becoming available. Overleese Pawpaw has a mango-like flavor, one of the choicest of any fruits.

Ketter (from Lawrence County, Ohio) a prize-winning variety in 1917, with September ripening fruits as large as 12 ounces each, also soon may be available as scions from trees that were grafted in Pennsylvania.

Davis, a variety from Michigan, with fruit similar to Overleese, was first grafted in 1960, and scions are available.

Sunflower, a Kansas variety is also recommended.

Fred Smith, a good-fruited variety, originated on a farm north-west of Urbana, Illinois, where scions are available. Other varieties may be grated from trees selected between Oklahoma, Maryland, and Michigan.

Pawpaw seed planted in a shady place and left to grow for two years then transplanted to a full sunny place and given some protection from the sun for 1 year will do well after that.

The seed to be planted should not be allowed

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to dry.

The Silver Creek variety will be fruitful from suckers if there is cross pollination.

Pawpaw respond very well to heavy mulching.

Dear and goats wil not eat the foliage, bark or limb tips, however, a nibble from too many hungry sheep can ruin a tree.

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Because of the increased number of useful books available, Granny Smith has split up the Booklist into separate sections. If you would like any of these free sectional lists, just contact us. The sections are:-

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[The West Australian May 11 1989]

US NUTS FAIL WA HEALTH SAFETY TESTS

Widespread cadmium contamination has been found in peanuts imported from the US and being sold in Perth.

Results of tests on the nuts, ordered by the WA Health Department, showed they had cadmium levels consistently above the 0.05mg a kg maximum residue level set down by the National Health and Medical Research Council. The levels ranged from 0.15mg a kg to 0.17mg a kg.

The department was alerted to the problem after The West Australian bought a range of food items for cadmium testing.

When analysed by the Australian Government Analytical Laboratories, one of the samples bought by The West Australian, Olympic brand peanuts showed a reading of 0.10mg a kg.

Department tests carried out on Australian peanuts showed the cadmium residues ranged from less than 0.01mg a kg to 0.08mg a kg.

The department's principal food scientist, Mr Mike Jackson, said the US peanuts had been withdrawn from the market.

The peanuts had been brought into Australia by the Peanut Marketing Board in Queensland and all contaminated peanuts had been returned to the board.

The board's general manager, Mr Chris Box, said that of the original consignment of US peanuts, about six to eight tonnes remained unsold.

These were going to be resold to a country which allowed greater levels of cadmium residue. He was reluctant to reveal the country.

[The West Australian Wednesday May 17 1989]

FORESTS LINKED TO KEY CURES

SYDNEY: The potential of finding drugs to cure fatal illnesses would disappear if the destruction of Australia's rain forest was not stopped, a senior chemist warned yesterday.

CSIRO researcher Mervyn Hegarty said less than 5 per cent of the world's flowering plant species had been screened for their medical value.

Extinction of these plant species due to logging and agriculture could cost the world life-saving remedies worth potentially billions of dollars to industry.

Dr Hegarty, who discovered a natural compound expected to become a major medicine in combatting AIDS, was speaking at the launch of a $2.5 million World Wildlife Fund campaign to promote biological diversity by preserving the forests.

He said scientific communities in Australia and the US were alarmed that about two plant species and 58,000 ha of rain forest disappeared each day.

It was his study of the effect of plant dioxins on animals which led to the dicovery of castanospermine, a compound from the Queensland blackbean tree which may become a leading AIDS treatment.

"This is one reason we need to maintain the great diversity of compounds which exist in the rain forest flora," he said.

Dr Hegarty said that quinine and codeine were other examples of drugs developed from rain forests.

Plant-derived drugs accounted for 25 per cent of prescriptions filled out in US pharmacies, including 40 per cent of cancer treatment drugs.

"We rely very much for our health care on drugs derived from plants and in the developing world billions of people rely on natural plant remedies," he said.

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HELPING YOU GROW !

[Illinois Nut Tree Association Newsletter / Spring 1989]

From Corvallis, Oregon

I am sending the Nebraska Nut Growers several pounds of Turkish Tree Hazel seed, Corylus colurna. These are viable seed and could be stratified, or better yet, cracked out and germinated following GA (Gibberallic Acid) treatment.

The Turk will make a good rootstock for most European filberts. I have used it in close to 200 different graft combinations and never encountered an incompatibility situation. It will tend to overgrow a slow growing scion, but the union will not fail.

Chances are that the Turk will impart some degree of vigor to weak scion varieties which is what they need. The Turkish Tree Hazel is tap rooted and a bit shy of lateral roots, but once established, it is well anchored and able to obtain moisture from a deeper zone than the shallow rooted European hazel.

The Turk is a central leader tree, upright in character and its branches have narrow crotch angles. This latter characteristic is imparted to the scion which would be good for those that are roundheaded or weepy. The Turk produces an excellent callus and can be successfully topworked in the field as daytime temperatures approach 70 Degrees F. in the spring. Its outstanding characteristic is that it does not sucker. Disadvantages are that it has a thick seed coat and germinates poorly without special handling (see below).

It is somewhat slow growing and often takes two seasons to reach graftable size. It has a tendency towards reducing nut yields. I have not been able to show this statistically due to the high variability between trees, but I believe the trend is there. I do not believe this trend is serious enough to keep me from recommending its use with productive varieties.

For quick germination, the Turk must be cracked. This is sort of a tedious job as the seeds are small and the fingers large. The best system I have found is to use a small hammer and a thick piece of flat metal plate as a base. A slight depression drilled in the plate helps position the seed. The seed must be hit on its point with the right amount of force. It is not necessary for the kernel to drop out or come completely free of the seed shell. A good crack in the shell is sufficient. If the thin skin covering the kernel (the true seed coat) is broken, the seed is more susceptible to pathogens when it comes in contact with soil.

After cracking, submerge the seed in Gibberellic Acid (GA3) 25 ppm overnight, approximately 16 hours. They are now ready for planting to field or greenhouse. When the temperature is warm, germination takes about two weeks. If lined out in the nursery about 6" apart, they could be grafted in place during the second year and not have to be transplanted. If space is limited, they can be germinated and grown in a bed the first year. The very best of luck to your members in getting this interesting tree established.

— Harry Lagerstedt

Editors Note: The 1989 NeNGA seed packet will have seeds of the Turkish Tree hazel in it.

[NSW Dept Agriculture: Agfact H3.1.34]

Feijoas in the Garden

The feijoa or pineapple guava *(Feijoa sellowiana)* is a native of South America. It is an evergreen tree growing up to 4 metres high, with a spreading habit and attractive red flowers that make it useful as an ornamental.

The oval fruits, which are about the size of a passionfruit, are green-skinned with white to grey flesh and a strong odour. They can be eaten fresh, juiced, preserved or made into jams. The ripe fruit is rich in vitamin C.

Varieties

There are two varieties suitable for New South Wales. Mammoth has large fruits with good flavour, is self-fertile and usually bears a good crop. Triumph has similar quality fruits that mature later; cross pollination with Mammoth is necessary for a good crop.

Seedling feijoas are variable and should not be grown.

Location

Feijoas are very hardy and will tolerate a wide range of soil types. They do best in well-drained, fertile, loamy soils that are slightly acidic. They are only mildly affected by frosts, and can be used as windbreaks.

Propagation

Feijoas can be propagated by seeds, cuttings, or grafts. Seeds germinate readily but the quality of the seedlings is variable.

Planting and Caring

Feijoas are best planted in spring, except in the northern rivers area, where autumn planting is preferred. They are drought-hardy but adequate watering in summer is essential for good fruit quality.

Nutrition

Feijoas require an application of a 10:4:6 fertilizer (e.g. citrus fertilizer) each winter before the end of August. Apply this at the rate of 500 grams per year of age until the tree is ten years old, then continue to apply at the ten year rate. Spread the fertilizer evenly around the tree but do not let it accumulate around the trunk.

Pruning

Young plants require little pruning: cut them back to a single leader (main branch) at planting time and remove any suckers or low growths that appear. Prune bearing trees only to reduce the number of laterals (minor branches) in the centre and to encourage new growths.

Pruning Hints

- If you are pruning to encourage new growth, make cuts just above an outward pointing bud or shoot.
- Cut out *all* dead or diseased material; don't leave stubs.
- Remove crowded or crossed branches.
- Paint cuts larger than 2 m across with a bituminous wound dressing.

Harvesting

Grafted feijoa trees begin producing worthwhile crops in their third and fourth year. The fruit ripens in March/April and remains firm and on the tree until it falls. Do not pick the fruit but let it drop, as the brusing resulting from the fall stimulates the ripening process. Although the skin of the fallen fruit may be blemished, the fruit's flavour will be better than that of fruit picked from the tree.

Problems

The main insect pests of feijoas are fruit fly, light brown apple moth and wax scales. Fruit fly is a major problem, especially in coastal areas. There are no major diseases of feijoas.

— S. Butler

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...(Continued from last issue)

[Agfact P6.2.1, second edition 1986]

TEA TREE OIL PART 2

There are three options for the grower to distil tea tree oil:

• The conventional small-scale bush still. An economic unit would be at least 20 ha.

• Hire mobile distillation equipment. An economic unit would be at least 20 ha.

• Through a central distillery, operated by private enterprise or as a co-operative, which would service a minimum economic unit of 200 ha.

YIELD

For several years after the initial harvest, oil yield increases because of the development of coppice shoots and the maturing of the trees and then levels off. Oil yields which might be expected from plantations on the New South Wales north coast are:

Harvest	Harvest intervals (months)	Dry site, natural rainfall without irrigation (kg/ha)	Moist site, or dry site with irrigation (kg/ha)
1	15 - 18	10 - 20	70
2	12	15 - 25	100
3	12	20 - 40	150
4	12	20 - 40	150

Because access to moist sites can be restricted during wet periods, you could consider irrigating a dry site. The higher cost incurred might be offset by the considerable benefits to management that would be achieved.

MARKETING

At present distillers sell the crude oil to two or three established suppliers who market a standard clear oil product packed in 20 and 180 kg drums. About 80 per cent of the oil produced in Australia is exported and marketed overseas through agents. Local outlets are companies manufacturing flavours, cosmetics, soaps, disinfectants and veterinary lines.

Despite a general acceptance of the therapeutic properties and usefulness of the oil of M. alternifolia its potential has not been realised. This is because:

• it has not been effectively marketed as a medicinal product of merit

• the market, primarily overseas, has been small, intermittent and unidentified

• supply has been limited by production from natural stands and has rarely exceeded 10 tonnes per annum

• it has been difficult to match supply to demand.

Both the rate of oil production and irregular supply have not encouraged market expansion. At the same time prospective producers also need assured outlets for their oil. If the market can be stimulated, the technology is available to boost oil production to meet an expanding demand for this natural germicide. The development of this small, but nevertheless valuable, industry would provide not only a useful additional source of income to rural areas on the north coast of New South Wales but also use the intrinsic properties of a native plant which often has been looked upon as a weed.

reference

Australian Standard K175 - 1967, Oil of Melaleuca alternifolia.

REMINERALIZATION

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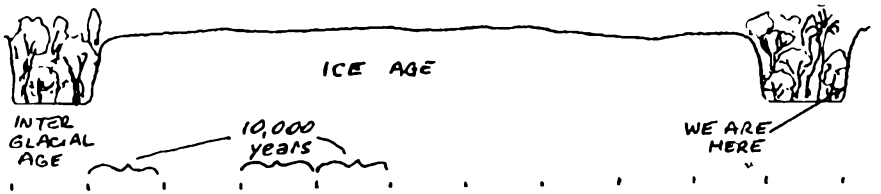
Background. The atmosphere is changing. CO_2 is building up, very largely as a result of human activity. But CO_2 has built up many times before in the vast history of the Earth. It has peaked at the start of each ice age.

Theorists believe that minerals essential to life are gradually leached from the soils. As plant life declines, CO_2 levels build up, affect the global climate, and precipitate an ice age. During the 90,000 years of glacial activity, exposed rocks on the Earth's crust are ground to a fine dust, thus recharging the soils with fresh minerals. As the ice recedes, vegetation returns to flourish in the revitalized soils.

Observations made in the Austrian forests, among the Hunza people of the Himalayan plateau, and in the fall-out from the Mt St Helens ash plume, confirm that adding finely-ground rock dust to humus-rich soils does indeed restore the health and vigour of soil micro-organisms upon which all other life depends. By adding the dust ourselves, remineralizing, we can replenish the minerals which a 90,000 year ice age does naturally.

Action. Men of the Trees are undertaking a research trial right now, and you are invited to participate. Each researcher will be supplied with enough rock dust to treat 2 m^2 of soil, and you need another 2 m^2 for an untreated 'control'. The dust will be available from our St Barbe Grove nursery throughout August. Each researcher will be registered and receive complete instructions. Results will be collected in December, and a party and get-together held then at St Barbe grove. Cost is $10. Please contact me for details, or with any offers to help!

— ***Barrie Oldfield***, 3 Over Ave Lesmurdie 6076 - Phone 09-291 6619



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CALENDAR OF FORTHCOMING EVENTS

1989		
Aug 16	Wed	*General Meeting (Barrie Oldfield: Crop Trees in Men of the Trees Plantings)
Sep 25-29		§ 3rd International Mango Symposium, Darwin
Sep 30-Oct 7		Royal Show, Claremont
Oct 17	Tue	Executive Committee Meeting
Nov 15	Wed	*Annual General Meeting (Judy Monks: Figs in W.A.)
Nov 26	Sun	Field Day: Lynn-Robinson Macadamia Orchard, Chittering
1990		
??		ACOTANC-90: 5th Australasian Conference on Tree and Nut Crops, Riverland, South Australia

*General Meetings are held at the Naturalists Hall, 63 Meriwa Street, Nedlands, startingat 7.30pm. These meetings usually include a current magazine display.
§ For contact details refer to the Tree Crops Centre

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