



QUANDONG

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Newsletter of **WANS** the West Australian Nutgrowing Society

* ANNUAL GENERAL MEETING NOVEMBER 18, 1980 *

SUBIACO LIBRARY MEETING ROOM

7.30 P.M.

(CNR OF ROKEBY ROAD AND PAGOT ROAD) *

Here we are fast approaching 1981 and this is our final newsletter for 1980 with the last meeting and A G M to be held on November 18, 1980. At this meeting there will be a Guest Speaker.

The introduction of the quarterly meetings has been as successful as the Committee had hoped and at the last meeting we had over 40 people attending. Mr Bevan Green showed a film on irrigation in Israel and then explained the various types of irrigation equipment available and the advantages or disadvantages of each type of outlet.

Tentative dates to remember next year for meetings are

February	24
May	26
August	25
November	24

Another date to look for is in March/April, a field day will be organised. We are hoping to visit several interesting properties to show members various nut trees. Details will be in the February issue of QUANDONG.

SUBSCRIPTIONS

This is just a quick reminder to members that the financial year for WANS is January 1 to December 31, and prompt payment would be appreciated. A subscription form will be issued, as usual, with the February Newsletter so please save your Secretary/Treasurer some extra work and send them back as soon as possible if not prior to this date.



West Australian Nutmeg Society

WANS

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SOCIETY PUBLICATIONS

WANS publishes its newsletter QUANDONG four times a year. This is devoted to news of meetings and events, details of tree and seed sources, notes about books and pamphlets dealing with nuts, reprinted short articles, notes from members, and other items of interest. The major publication is the annual WANS YEARBOOK, which contains articles drawn from Australia and overseas, covering any aspect of nut horticulture and production, and is regarded as an important research journal in this area. Members receive one copy of each WANS publication as a subscription benefit. YEARBOOK EDITOR, Dr D. Dell, School of Environmental and Life Sciences, Murdoch University, Murdoch, W A 6153. QUANDONG EDITOR, Mr Tony Bryant, P O Box 98 Gosnells, W A 6109, 459 2449. BACK NUMBERS, WANS began publishing in 1975. Back numbers of publications are still available. Some issues of QUANDONG are available only in photocopy form. Cost of each YEARBOOK is \$6.00; cost of a one-year set of QUANDONG (3 or 4 issues) is \$2.00. Contact the Secretary for back numbers.

MEMBERSHIP

Any person or organisation interested in growing or production of nuts may subscribe for membership. Members are welcomed from outside Western Australia and overseas, as well as in W A. Write to P O Box 27, Subiaco, W A, 6008. The current membership subscription rate, which runs for a calendar year and covers all publications issued in that year is \$10.00.

WANS CO-OPERATIVE

Members of the Society own a limited company, West Australian Nut Supplies Co-operative Limited, a commercial organisation set up to buy and sell nut and nut products. Shares in WANS CO must be applied for on the printed form available from the office. Shares cost \$1.00 each; limits are from 50 to 250 shares per person.

PROPOSAL FOR A NUT GARDEN IN SUBIACO

This has been mentioned in previous issues and to keep members informed the following is a copy of the preliminary correspondence between WANS and Subiaco City Council. Should you wish to comment on this please write or bring it up at the A G M.

Mr Sam Morrison
Superintendent of Parks & Gardens
City of Subiaco.

1980-7-18

Dear Sir,

Proposal for a Nut Garden in Subiaco

Further to our informal discussions on this matter, and on the possibility of using land at the Darglish Basin for this purpose, I have pleasure in submitting this proposal for consideration by Council.

In my opinion the suggested area would be most suitable for such a planting of nut-bearing plants (the technical term for such a garden is a caryetum). I feel that it could be developed to provide an area of beauty and also great horticultural value, without losing any of its current value as a passive recreational area.

Attached is a draft agreement drawn up for consideration by Council. It is not intended to be definitive, and we would welcome your suggestions as to any modifications.

If the project does go ahead, I would suggest that the area be thickly planted with fast-growing, expendable wattle trees during the current wet season. These trees grow like weeds (eg. at the Senior Citizens' Centre site in Shenton Park), and would be desirable for this project as they improve the soil and provide shelter for some of the more tender trees to be planted later. They have a limited life and can be removed if required without too much compunction.

It is not a matter for immediate concern, but at some time in the future Council may wish to set up a by-law controlling the taking of fruits from public parks, if such a by-law does not already exist.

The Society is most grateful for the opportunity to put forward this proposal, and hope it will be of mutual benefit and will further improve the standing of the City Administration.

Yours sincerely,

David Noel
Subiaco Nut Garden Project 3.

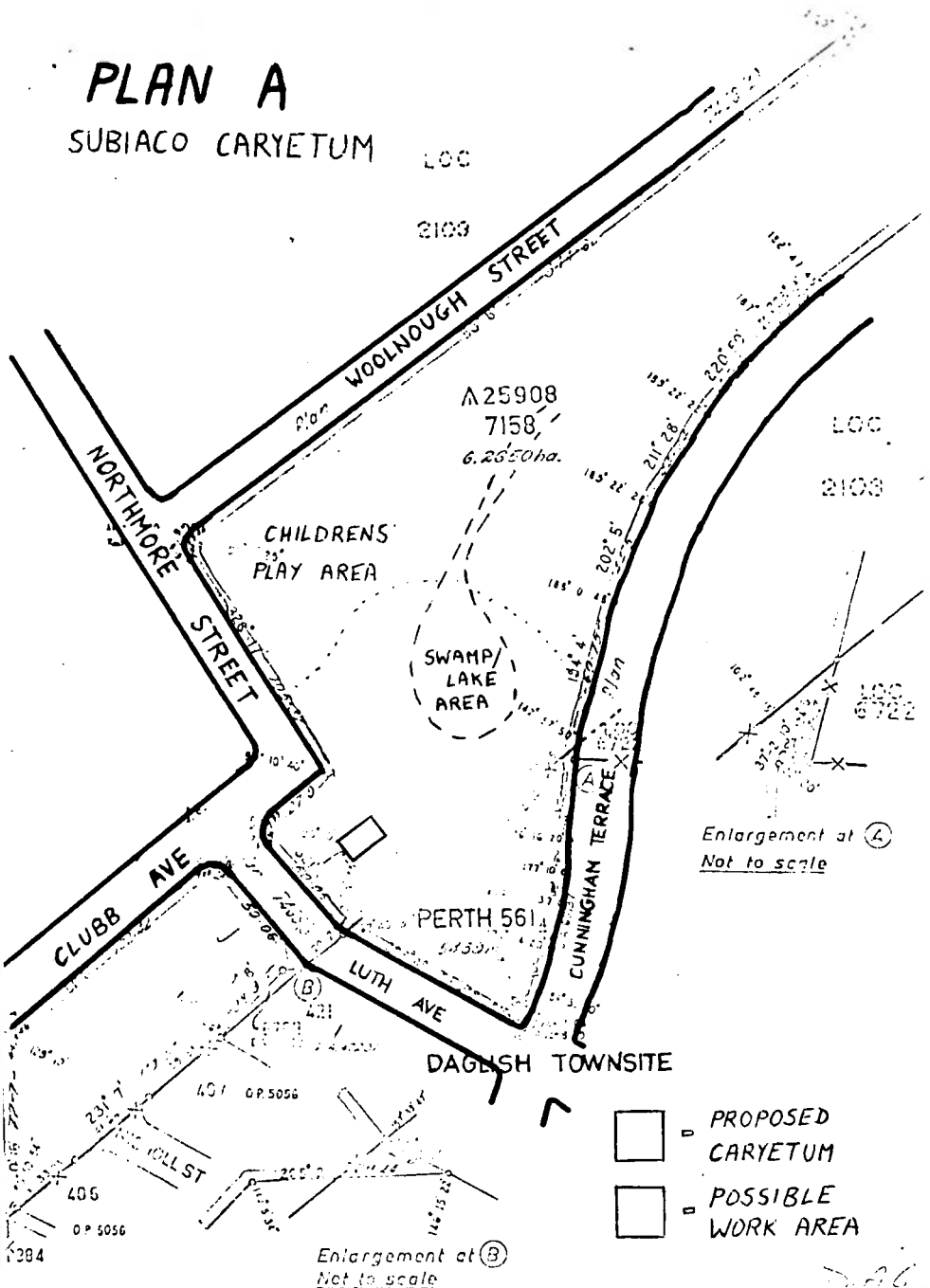
PLAN A

SUBIACO CARYETUM LOC



2108

LOC

2108



DAGLISH TOWNSITE

-  = PROPOSED CARYETUM
-  = POSSIBLE WORK AREA

NO DISTRICT
SWAN

PERTH LOT 561 & SWAN LOC 7158 (A25908)

GROWING MACADAMIA SEEDLINGS FOR PROPAGATION - PART 1

(Source: Australian Macadamia Society, Fact Sheet No. 4, July 1980)

A series of commonly asked questions have been answered in this article.

QUESTION 1

What varieties or types of macadamias should be grown as seedlings for rootstocks for grafting?

There appears to be no valid experiments to show that any particular type is superior to any other type in the long term. Good mature macadamia orchards exist on both integrifolia and tetraphylla rootstocks.

Some nurseries prefer tetraphylla seedlings as rootstocks as they generally germinate quicker and more evenly, grow faster in the nursery and the wood is softer, thereby making grafting easier. However, there is some suggestion that there may be a latent incompatibility problem occurring later in the tree's life when a hybrid or integrifolia type is grafted onto a tetraphylla rootstock, but there is no available data to substantiate or deny this. There are also unsubstantiated reports that tetraphylla rootstocks are more resistant to Phytophthora trunk cancer.

Many nurseries are very successfully using seedlings of 246 and 508 for grafting onto. Perhaps other accepted varieties such as 660 could also be used. There appears no sound reason why these varieties cannot be used for rootstocks.

Another method for selecting the variety to use as the rootstock is by the availability of early mature nuts. Some nurseries select varieties where the nuts are mature enough for germination in January. When planted in January, it is possible to be able to graft in August/September whereas nuts collected in March/April would not produce plants ready for grafting until the following year.

The early maturing nuts are tree harvested as soon as they are considered mature enough to germinate. Experience is the best teacher here but when the husk begins to crack and can be easily separated from the nut is a guide, so also is a darkening on the inside of the husk.

QUESTION 2

If a grower decides to grow his own seedlings, which nuts should be used?

Freshly harvested mature nuts are essential. Firstly discard any obviously damaged or inferior or small nuts. The remaining could then be floated in water and the "floaters" discarded. The sound nuts remaining could be tested for freshness by rattling. Discard any rattlers.

QUESTION 3

How soon should these nuts be planted?

Germination treatment should be started as soon as possible, preferably within a week. If it is wished to store the nuts until spring, they should be stratified in moist sand or peat and kept in the dark at cool temperatures of 8-10° C. A lower percentage of germination could be expected when these stored nuts are germinated.

QUESTION 4

What type of pre-germination treatment is needed for the nuts?

None is essential, in fact cracking of the nuts prior to laying down could cause considerable losses in germination. A good idea practised by some growers is to soak the nuts for 1-2 days in water (extreme maximum of 3 days) prior to laying down. This will give a more even and faster germination.

QUESTION 5

How should the nuts be laid down for germination?

There are many accepted ways of germinating macadamia nuts. Some of these include :

- (i) Laying the nuts in between two layers of moist hessian and lifting as soon as the nut cracks and germination has obviously started. Then plant into growing bags or nursery beds.
- (ii) In moist sand, peat or sawdust until germination starts and then lifting out and planting into the containers or beds.
- (iii) In seed boxes for germination and some growth, and then transplant when a suitable size (150-200 mm maximum is suggested). If this technique is practiced the boxes or beds need to be deep enough to allow for root growth (approx. 200 mm).

- (iv) Field planted into nursery rows where they can be later thinned out. The thinnings could be planted elsewhere if required.

One large nursery considers the ideal would be to place the nuts with the suture line horizontal on a moist sand bed (say 75-100 mm deep) with the seed about 4-5 mm apart. Fill the gap between the seeds just leaving the tops exposed, then place sand between the nuts, water thoroughly and cover the seed with moist sawdust (5-10 mm). The nuts can be checked periodically for start of germination and as soon as it starts, the nuts could be removed as they come ready and placed into growing bags.

QUESTION 6

How long should germination take?

Germination (nut cracking and root and tip showing) may be as quick as 2-3 weeks in a hot house situation but generally takes 3-5 weeks, depending greatly on temperature and to some extent shell thickness. Some varieties may take much longer.

QUESTION 7

Does the nut need to be laid down in any particular way?

Ideally the best way is with the suture line horizontal (sideways). If this is not done, the shoot, and the root in particular, could be twisted or curled, leading to a poor root system developing. If it is not practical to do this, then the seed must be lifted for planting immediately germination is evident or allow for some rejects because of the twisted or distorted roots.

QUESTION 8

What happens if the seeds are left too long after germinating before planting into growing bags or nursery beds?

If the root grows too much and becomes entangled or grows twisted, then unangling generally results in root damage which is undesirable although perhaps not disastrous. If the tip growth is noticeable in the seed box, then generally the root growth is far more advanced by this stage and should be immediately planted out.

The Spreading Chestnut

Nut and Fruit Trees
Food and Crop Trees

P0 Box 27 Subiaco
WA 6008 Australia

The Spreading Chestnut is now in full operation and has a wide range of nut and fruit trees available. These currently include:

GRAFTED TREES

Pecans #16; Chestnuts (very seldom available!) #20; Macadamias #18; Redcurrants #3; Gooseberries #4; Mulberries #8; Blackcurrants #4; Contorted filbert #10; Custard apple #12; Raspberries #2; Persimmons #12; Triple grafts (2 peaches + 1 nectarine on same tree) #12.

SEEDLINGS

Pecans #4; Macadamias #4,#5; Carobs #3; Black walnuts #4; Moreton Bay chestnuts #4; Honey locusts #3,#6; Bunya pines #4,#5; Walnuts #3; Marulas (very rare) #10; Chestnuts #4; Stone pines #6; Horse chestnuts #3; Scarlet oaks #3; Pistacia rootstocks (atlantica and chinensis) #2,#4,#5; Hazels #4; Burrawongs #5; Loquats #2; Pomegranates #6; Ginkgos #3.

The following are expected to be available later or may be available to special order: Litchis, California black walnuts, hickories, kei apples, American hazels, candle nuts, tungs, grafted pistachios, cork oaks, chilghoza pines, kaffir plums, kiwi fruit, sapodillas, cashews, burdekin plums, coconuts, papayas, custard apples.

The shop is located directly opposite the Cemetary Gates, Karrakatta, and is open weekdays and Saturday mornings. Phone number is 384 0019.

NUTS FROM THE SEYCHELLES

(Source: Fantastic Trees, 'Strange Fruits and Nuts',
Edwin, A. Menninger, 1975)

If you were to stand under a Seychelles palm nut tree just as one of the nuts is about to drop, you would be lucky to escape. The solid fruits weigh anywhere from 30 to 40 pounds, and there are as many as 70 such blockbusters clustered on a single tree. Each one measures about 3½ feet around, and they take six years to ripen. The result is the biggest seed in the plant world - but not the biggest fruit.

Some persons make the mistake of calling this the double coconut, but it is not a coconut. It grows on a fan-leaf palm with sexes on different trees; the coconut grows on a feather-leaf palm with both sexes on the same tree. The outer husk of the Seychelles nut is smooth, brown, and less than 1 inch thick, and it splits off; the thick greenish-yellow shell beneath is not double but lobed. The fruit is usually two-lobed, sometimes three-lobed, and very rarely six-lobed.

When the fruit is ten to twelve months old it has reached its maximum size and at this stage it is frequently eaten. Its jelly-like interior is much appreciated throughout the Seychelles. It is colorless, practically tasteless, save sometimes for a slight nutty flavor...From this stage onwards, the soft, jelly-like endosperm gradually sets to a very hard tissue resembling ivory.

For centuries this nut, sometimes called coco-de-mer, was a mystery. Because it is heavier than water, it sinks; but when the husk has been shed and the interior has rotted, it will float. Sailors of long ago picked them up on the shores of the Indian Ocean, but medieval sages could not say whether they were animal, vegetable, or mineral. Tales persisted that they came from the Maldives Islands, three hundred miles south of Ceylon; or that the trees grew in submerged gardens near Java but disappeared when sailors dived for them; that when the trees did extend above the water, a griffin lived in them and devoured any humans that chanced by. (When not so occupied, the griffin flew to the nearest land and ate elephants).

The nut was highly prized. Superstition credited it with being a precious talisman, a universal panacea for all ailments, an antidote for all poisons, a protection against enemies, and a powerful aphrodisiac. Hooker says some kings were so greedy for the nuts that they offered to give a loaded ship in exchange for only one. Common folk were forbidden to possess one. Rudolf I of Hapsburg offered four thousand gold florins for a single nut.

All this nonsense blew up when the palms were discovered on Praslin (one of the Seychelles) in 1742, and an enterprising merchant dumped a whole boatload of the nuts on the market in India. The price collapsed. Today the nuts can be purchased in Singapore, Bombay, Karachi and other ports.

Seychelles palms do not bear till they are one hundred years old or more. No one knows how old the biggest palms on Praslin are, or what age they finally reach.

To germinate the seed, men husk the nuts, allow them to dry for several months, and then place them on the surface of the ground in a moist place. Four months after germination has begun, a shoot or "sinker" 6 inches long and about 1 inch in diameter has grown through a soft spot in the crotch of the lobes. The tree embryo is at the tip of this sinker, not in the nut. This shoot, if it meets no obstruction, penetrates the soil. If, however, it strikes a rock or other hard surface, it will travel horizontally for some distance and try again. A hard-pointed sheath develops at this point, and nine months later the first leaf sprouts at a forty five degree angle from the root. It is closely folded, has a smooth hard surface and ends in a sharp point. When about two feet above the surface, it expands. Nine months later another leaf follows, coming up the grooved surface of the midrib of the leaf which preceded it, and so on at intervals of nine months, each succeeding leaf becoming larger in size. All these leaves cluster together and support each other, no stem appearing above the ground. From the age of fifteen to twenty-five the tree is in its greatest beauty, and the leaves of this period are much larger than they are subsequently.

Bailey describes the curious construction of this palm :-

Unlike the coconut trees, which bend to every gentle gale, and are never quite straight, the Coco-de-mer trees are as upright as iron pillars, undisturbed in their position by the heavy gales and violent storms so often occurring in tropical regions.

The arrangements...for the roots...are of a most peculiar nature, quite distinct from those provided for any other known tree. The base of the trunk is of a bulbous form, and this bulb fits into a natural bowl, or socket, about two and a half feet in diameter and eighteen inches in depth, narrowing towards the bottom. This bowl is pierced with hundreds of small oval holes about the size of a thimble, with hollow tubes corresponding on the outside, through which the roots penetrate the ground on all sides, never, however, becoming attached to the bowl; their partial elasticity affording an almost imperceptible but very necessary "play" to the parent stem when struggling against the force of violent gales.

One of the strangest aspects of this Seychelles palm is the way it sheds water. Durocher-Yvon describes the leaves, which are enormous - the petiole (leaf-stalks) eight to twenty feet long and the fan shaped blades ten to sixteen feet long and five to eight feet wide. Three or four of these are enough to thatch the roof of a house. The number of leaves on a tree ranges from twenty to thirty but never exceeds those figures even on forty-year-old specimens. He continues :-

The leaves with their deeply-channelled petioles direct the flow of water (in a rainstorm) down the trunk of the tree. This water prevents the vegetative bud in the centre of the crown from drying out and also supplies the base of the palm with moisture for the roots. During rain, except for the area immediately surrounding the base of the palm, there is

a large area within a circumference of fifteen feet or more which is left completely dry. Outside this area raindrops fall from the drooping ends of the leaves.

During heavy rains the palms growing along the Grand Anse-Baie St Anne's road afford excellent protection to passerby. I remember having stood under the crown of a palm when it was raining heavily, and yet kept quite dry as if...indoors.

DURIAN

(Source: Fantastic Trees, 'Strange Fruits and Nuts',
Edwin, A. Menninger, 1975)

The durian is not only the world's most dangerous fruit - especially if a ten-inch, ten-pounder, covered with thorns, drops on your head - it is also probably the only fruit in the world so prized by those who love it for food that they risk their lives to get one.

The durian grows on a tall, broad, heavily buttressed Malayan tree and is famed for its odor, which is highly offensive, at least on first acquaintance. Corner says :

The odor of the fruit in season attracts wild animals from afar. The elephants, it seems, have first pick, the tiger, deer, pig, rhinoceros, seladang (a wild buffalo), tapir, and monkey enjoying what is left. In those parts of Pahang where durians are common in the forest...Malays and Sakai build shelters in the trees, above the reach of elephants, whence they can descend by a ladder to pick up the fruits as they drop. Tales there are of Malays who have gathered a fruit only to be gathered in turn by an elephant.

The round or egg-shaped fruits, weighing 6 to 8 pounds or more, grow on stringlike stems from mature branches. They have thick, hard rinds covered with stout, thickly set, sharp-pointed, half-inch spikes. Corner says: "The fruit takes about three months to develop and is not fully ripe till it has dropped from the tree; it then begins to gape into five pieces".

Reaction to the luscious-looking, custard-like pulp which surrounds the one to four seeds in each section is widely divergent. Malays love it. In "Tropical Planting and Gardening", Macmillan says it is also esteemed by some Europeans who acquire a taste for it after learning to ignore the smell. It has been described as 'resembling blanc-mange, delicious as the finest cream'. Alfred Russel Wallace felt the sensation of eating durians was "worth a voyage to the East". He wrote : "A rich custard, highly flavoured with almonds, gives the best general idea of it, but there are occasional wafts of flavour that call to mind cream cheese, onion sauce, sherry wine, and other incongruous dishes. Then there is a rich, glutinous smoothness to the pulp which nothing else possesses, but which adds to its delicacy. It is neither acid, nor sweet, nor juicy, yet it wants none of these qualities for it is in itself perfect. The more you eat of it, the less you feel inclined to stop".

Less complimentary opinions of the durian's odor could be quoted. One compared it to "French custard passed through a sewer pipe".

When dried it is delicious even to the Occidental palate.

BUNYA PINE IN QUEENSLAND : GRAFTING, POLLINATION, SEEDING, AND RELATED SPECIES

(Source : WANS Yearbook, Vol. 1 1975).

The Bunya Pine *Araucaria bidwillii* Hook, is a Queensland native which produces a valuable timber. It has a limited natural distribution, occurring mainly in association with Hoop Pine in rain forest areas of southern Queensland as an emergent species. In 1948 an isolated patch of Bunya Pine was located near Mt Molloy, west of Cairns. Most remaining sites containing natural stands of the species are located on State Forests, on which a permit may be granted for the collection of Bunya Nuts at \$0.20 per cone. Bunya Pine has, of course, been widely cultivated in Queensland.

The Queensland Forestry Department does utilize Bunya Pine as a plantation species to a limited extent on rain forest sites. Our major plantings in rain forest areas are of Hoop Pine (*Araucaria cunninghamii* Ait) which is more suitable for our purposes because

- (a) of its more rapid growth rate and,
- (b) it is easier to manage in the nursery.

Bunya Pine is slightly more resistant to frost damage and more tolerant of grass competition and so is utilized in areas where these factors can be a problem.

NURSERY PRACTICE

Nursery technique for Bunya Pine is relatively unsophisticated. Briefly it involves deep sowing of seed ("nuts") covered with a mixture of soil and pine sawdust, and potting into metal tubes when they reach about 6 ins. in height. Germination is slow and erratic; this refers only to the emergence of the epicotyl. The Department usually sows several hundred pounds of seed at a time with emergence (and consequently potting) stretching over a considerable period. When potting, the original seed containing the cotyledons is kept intact. Plants are kept in the tube for at least 6 months before outplanting.

VEGETATIVE PROPAGATION

Because of its limited importance to the Forestry Department, little attention has been placed on vegetative propagation of Bunya Pine. Considerable effort has however been applied to genetic improvement of Hoop Pine in Queensland and the broad principles will apply to both species.

Initially various cutting and air-layering techniques including root-cuttings were attempted with hoop pine (and *Agathis* species of the same family) but for reasons that will become apparent below, as well as the relatively low success rate, little attention is now placed on such techniques other than in exceptional circumstances. Successful grafting techniques have however been developed.

Grafting Procedures rely on an understanding of the bud system of *Araucaria* and *Agathis* species (common with the Northern Hemisphere firs - *Abies* spp.) These are described in a Queensland Forest Service publication written by D K Nikles(1). The contents are not quite up to date, but would explain in some detail the problems. I will attempt to outline the techniques.

(a) The Bud System

It has been discovered that branch material does not produce satisfactory plants when propagated. This is because of the peculiar bud system of this group of conifers. Dormant buds are of two types -

- (i) plagiotropic bud traces on branches which if allowed to develop produce only branch habits - an "irregular, sprawling tree",
- (ii) orthotropic bud traces on the main axis of stems which produce leader growth, from which lateral branches will still of course develop (Fig. 1)

Consequently any use of branch material for vegetative propagation will produce plants which are in effect merely a branch or branches. (With Hoop Pine at least, rare seedlings may be encountered which also have the branch habit).

Because of the above, material available for vegetative propagation is limited to the stem axis, containing orthotropic buds. One such dormant bud is located in the axil of each leaf on the stem and is capable of developing a terminal shoot. (See Fig. 1).

As stated, cutting and layering techniques have been attempted, but even with the correct material, success rate has been limited, and grafting is now standard practice where vegetative propagation is required.

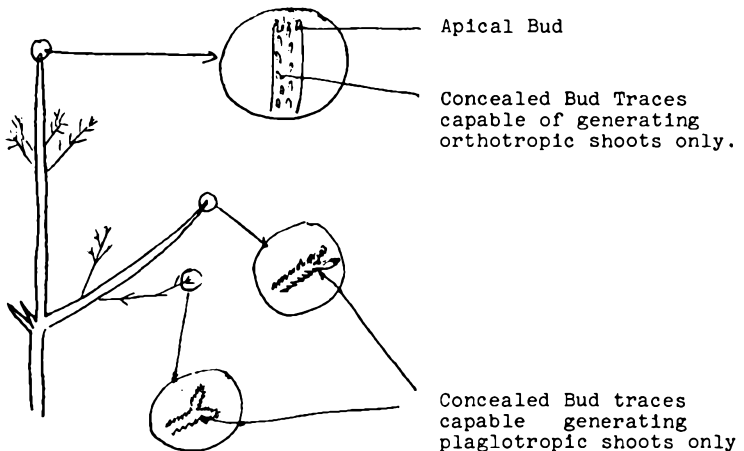


FIG. 1 Bud Systems of Hoop Pine

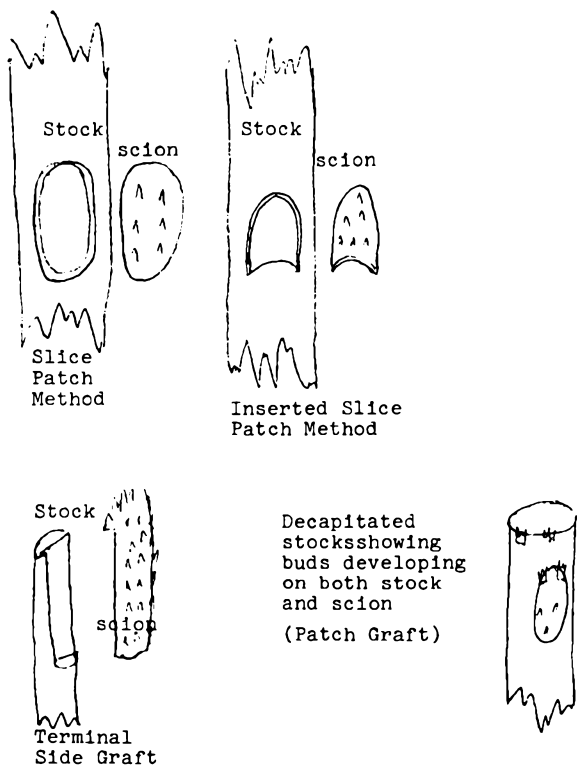


FIG. 2 Hoop Pine Grafting Techniques

(b) Grafting Material

Material utilized for this purpose is limited to that portion of the terminal shoot which is of similar diameter to stock plants upon which the grafting is to be carried out, and which still contain chlorophyll in the stem epidermis. This has to be collected by climbing and removing the tops of parent trees for scion material (an unpleasant job for Bunya Pine). Of course, once successful grafts have been produced, the material from these can be utilized for further grafts.

(c) The Grafting Techniques

Many forms of grafting have been attempted for Hoop Pine. Best results for our purposes are achieved with

- (i) slice patch grafts, and
- (ii) terminal side grafts.

The amount of scion material available from a given tree is limited and so to make greatest use of this, the slice patch graft is the most efficient. This merely involves the removal of an oval shaped patch of tissue from the stock plant, just down to the wood, 2-3" long and an inch wide, with a matching slice removed from the scion material (matching size, shape and tissue exposed as closely as possible). This scion patch is placed on the bared patch on the stock plant bound with grafting tape (starting from above the patch and winding down to help keep moisture out) and sealing both ends with grafting mastic (eg. Col-graft). Leaves or needles are first scraped gently off to facilitate the binding. Some 3 or 4 weeks later the tape can be removed and if the graft has "taken" the stock plant is decapitated about 1" above the top of the patch. For Hoop Pine success rate is generally in excess of 90%. Up to 100 grafts can be made from one leader of scion material for Hoop Pine, but I would imagine this figure would be considerably less for Bunya Pine.

The terminal side graft can be used for the top portion of the scion material. It and other techniques are shown in simple form in Figure 2. The other techniques have no advantage, although some prefer the inserted slice patch which leaves one hand free for winding the tape.

Following decapitation the dormant orthotropic buds on the scion patch begin to develop within a few weeks with one bud usually becoming dominant fairly rapidly. However, dormant buds on the top section of the stock plant also emerge and require periodic removal until the shoot from the patch has taken full dominance and normal tree habit is resumed.

Some incompatibility problems can occur with hoop pine, following successful take of grafts, either at an early stage (i.e. within the first year) or several years later. The situation with Bunya Pine is unknown.

FLOWERING

A further problem is that different parts of the tree crowns bear the male and female flowers respectively. With Hoop Pine in particular, physiologically older branches bear the male sporophylls or catkins, i.e. the female flowers occur near the tops of the trees, while the male ones are lower down. This means that a graft will produce female flowers within two years of grafting (for Hoop Pine) but will not produce pollen until around 6 years later. This is probably less of a problem with Bunya Pine which produce catkins over a greater part of the crown, although an observation is that some Bunya Pines are far more prolific producers of pollen than others.

To overcome this problem in Hoop Pine the Queensland Forestry Department also graft plagiotropic shoots i.e. branches from the middle one third of tree crowns on seedling stocks adjacent to the stocks with orthotropic grafts. (Terminal side grafts). These produce a branch as the apex which produces pollen and consequently open-pollination can occur between grafts within two or three years, with viable seed two years later. This could not be necessary if hand pollination were carried out.

Flowering of Bunya Pine has not been followed at all closely. Dallimore and Jackson (2) state "Male and female strobili are usually on different trees, occasionally on the same tree". I certainly have noted some entirely male trees. The same comments are made by Dallimore and Jackson about the Chile Pine (*A. araucana*). Many conifers (and certainly *A. cunninghamii*) will successfully self pollinate and produce viable seed. Our documented results demonstrate, however, that the resultant progeny are markedly inferior in vigour when planted. This may not affect production of nuts, but such seed should not be used for future growing stock. Seed orchards of conifers are normally designed to include a range of desirable parents, with clones located so as to avoid inbreeding as far as is possible.

An important point to note is that female flowers or conelets are receptive to pollen for only a few short weeks. This period of receptivity is best gauged by close and frequent examination of the very young conelet (i.e. starting when the conelets are only a centimetre or so long). The conelets are receptive to pollen only while the conelet scales can be seen to be open. It may not be reliable to gauge this period by merely observing pollen flow from other trees as considerable racial variation in timing of pollen flow may occur (certainly does for Hoop Pine).

Periodicity of cone crops is incompletely understood. Some refer to a three year cycle, but this in fact is by no means fixed and can vary widely. Seasonal conditions appear to be involved, as well as the effect of a heavy flowering one year precluding effective flowering the following year. Orchardists treat the latter aspect by spraying with growth retardants, thus promoting lighter flowerings every year, but the seasonal effect is as stated improperly understood, and is more of a problem with species such as the Araucarias. There may be some variations between individual parents in this respect but observations suggest that good and poor flowering years occur uniformly on most trees in the one area.

EARLY BEARING

No information is available on early bearing trees (which would be of little importance if grafting), or of the gourmet value of different seeds or nuts.

OTHER NUT-BEARING ARAUCARIAS

Hoop Pine (*Araucaria cunninghamii*) of course does not produce edible nuts. The Department has attempted to utilize parana pine (*A. angustifolia*) in trial plantations. I am not familiar with the results at other centres, but in the Yarraman District on sites

receiving annual rainfalls from 32" to 45", mostly on krasnozems of basaltic origin and previously supporting rain forest, the species has not performed favourably and is no longer considered to have potential for our purposes. Unsuccessful cross-pollination with pollen from other Araucarias was attempted on one plot a few years ago (at the time, male and female flowers were on different trees). Local staff have indicated that they prefer the flavour of Parana pine nuts to those of Bunya Pine.

The Chile Pine or Monkey Puzzle tree (*Araucaria araucana*) has not demonstrated potential as a plantation species under our conditions.

Literature Cited

- (1) Nikles, D.G. "The Development of a New Method for Grafting Hoop and Kauri Pines", Queensland Forest Service, Brisbane, 1961. (Research Note No. 10).
- (2) Dallimore, W. & Jackson, A.B., "A Handbook of Coniferae including Ginkgoaceae", Arnold, London, 1931.

MEMBERS CORNER

Come on members how about telling us what you are doing. I can't write about myself so please help.

Two new members sent pamphlets to us telling of their activities which I have reproduced here as I think they are of interest.

NORTH QUEENSLAND PECAN NURSERY

28 Alexandra Street
North Ward
Townsville, Qld 4810

THE PECAN NUT

The Pecan (*Carya illinoensis*) is a native of southern U S A, and northern Mexico. It is a perennial tree in its growth and production, growing to quite a large size and great age. The Pecan nut is recognized as a delectable nut and a choice morsel of food, being very high in protein and oil. It was used as a protein source by the U S astronauts. It blends well with other foods and is used in a variety of dishes.

WHY GROW PECANS?

The Pecan industry in the U S A is a multi-million dollar business with the industry in Australia heading towards this. There is a growing market in Australia, Asia and Europe. With the new varieties and methods of growing, it is a very profitable industry.

VARIETIES

North Queensland Pecan Nursery is the only nursery in Australia to have all of the new varieties imported from the U S A.

The varieties we recommend include Cape Fear, Candy, Sumner, Desirable, Success and Cheyenne. These have been developed for high density planting plus early heavy production. They have produced an average of 10-15 kg, of nuts per tree at 6 years and an average of 30-40 kg at 10 years.

SOIL AND CLIMATE

Two important factors affecting the success of Pecan growing are soil and climate. The Pecan tree can grow in a wide range of soils but it needs to be well drained, deep and fertile. Good alluvial soil is excellent.

A cool climate during the winter months is desirable, but high summer temperatures have no adverse effects on the Pecan.

GROWER SERVICES

North Queensland Pecan Nursery offers services to all Pecan growers. These include orchard establishment advice, nutrient testing and assistance in orchard control. N Q P N maintains contacts within the Departments of Horticulture at the Louisiana and Texas State Universities.

SUPPLY

N Q P N sells bare-rooted trees during July and August while the trees are dormant as this allows ease of handling and less expensive transport costs.

There are two marketing procedures used by N Q PN.

Procedure 1

The prospective grower purchases a seedling for \$1.00. This seedling, over the next one to two years, will be maintained and grafted at N Q P N. It will then be sent to the owner. The maintenance, grafting and transport costs are \$13.00 which because it is an expense incurred for the maintenance and improvement of the tree it is Tax Deductible. Hence there is a tax deduction of 93%.

Procedure 2

At certain times, N Q P N has grafted trees ready for sale at \$14.00 but as there are no tax advantages in this procedure it is not greatly used.

Arrangements can also be made for the purchase of non-grafted seedlings.

For the grower, Procedure 1 has the most to offer, because of the Tax Deductions and also that any losses that occur during growth and grafting are N Q P N losses and not those of the purchaser.

For order over 500 deduct \$1.50 per tree and for orders over 1000 deduct \$2.50 per tree.

All grafting, maintenance and transport costs are paid in Tax Deductible installments during the period the trees remain at N Q P N. These installments are designed to spread the cost for the buyer and will be tailored to suit the buyer's preference.

NORTH QUEENSLAND PECAN NURSERY REPRESENTS THE BEST IN PECANS

YEARBOOK

To ensure the continued success of our yearbook now is the time to send articles for inclusion to our Yearbook Editor; Dr B. Dell, School of Environmental and Life Sciences, Murdoch University, W A 6153.

P O Box 96
STANLEY, 7331
TASMANIA

SELF RELIANCE SEED COMPANY

Dear W A Nutgrowers,

The above company has been formed with the following objectives in mind;

- (1) To act as a practical focus for action to prevent the genetic erosion of useful agricultural plants.
- (2) to maintain and increase the availability of useful organic seed which reproduces true to type.
- (3) to process, package and record the origin of this seed.
- (4) to sell seed by mail order catalogue, and, should stocks permit, to retailers.
- (5) to act as seed bank by preserving adequate stocks of all varieties received.
- (6) to encourage self-reliance through home seed collection and by aiding similar seed groups; and
- (7) to provide seed at a reduced rate to disadvantaged or otherwise deserving groups.

We have been funded initially by gratefully received private donations and now wish to invite your subscriptions to our catalogue. Should you wish to assist financially in assuring the success of this venture, we suggest that you purchase additional subscriptions for your friends. Alternatively, we would be able to nominate some groups who would find a gift subscription useful. It is hoped to produce a catalogue in about two months, depending upon seed supplies; (we are collecting reliable seed and encourage any collectors to send seed to us. Some funds are available to purchase seed from national and world-wide seed banks and growers. This seed will be advertised in the catalogue. Priority distribution of initial seed will be to subscribers who wish to become seed growers, backyard or large-scale) This crop may then be sold by the company so that larger supplies will be available to the public. Any surplus of seed from growers will be immediately made available to gardeners.

We invite anyone with large quantities of seed to offer, to write to us for negotiation. As well as listing seed that is available, the catalogue will provide information on the proposed plant breeders rights legislation, plus a list of addresses of groups concerned about the legislation. It will also list informative literature relevant to our general aims.

We hope to catalogue sources of seed cleaning and other machinery. Information on home seed collections will also be printed. We invite contributions of any information that you feel may be useful in this area. It is expected that the catalogue will advertise

many rare vegetable and tree seed not at present commercially available. This should be of great assistance to those attempting to establish a Permaculture System.

The Self-Reliance Seed Company is a business of the Tagari Trading Trust and the profits are devoted to promoting self-reliance and perennial agriculture in Australian communities. We look forward to hearing from you.

Yours truly,

DON McCLURE

RECIPES

Haven't tried this recipe but for all the cooks thought it looked delicious so have a go!!

WALNUT TEA CAKE (F Crane, Croydon)

(Source : Victorian Nutgrowers Newsletter)

2 oz butter
½ cup castor sugar
1 egg
vanilla
¾ cup flour
1 teaspoon baking powder
½ cup milk

Cream butter and sugar, add beaten egg yolk and sifted dry ingredients alternatively with milk and vanilla. Fold in stiffly beaten white of egg. Spread ½ mixture in tin (greased and floured).

Filling

¾ cup brown sugar
½ cup chopped walnuts
1 tablespoon softened butter
1 teaspoon cinnamon
1 tablespoon flour

Mix thoroughly and spread over batter, add rest of cake mixture then remainder of filling on top.

Bake in moderate oven (350-375°) for 45-60 minutes.

ORANGE-FILBERT NOODLES

(makes 8 servings)

2 tablespoon salt
4 to 6 quarts boiling water
1 pound wide egg noodles (about 8 cups)
2 cups chopped filberts
 $\frac{1}{2}$ cup butter or margarine
2 teaspoons grated orange peel
1 cup orange juice
 $\frac{3}{4}$ teaspoon salt
 $\frac{1}{2}$ teaspoon pepper

Add 2 tablespoons salt to rapidly boiling water. Gradually add noodles so that water continues boiling. Cook, uncovered, stirring occasionally, until tender. Drain in colander.

Saute filberts in butter in saucepan about 5 minutes; add orange peel and juice. Combine filbert mixture, noodles, $\frac{3}{4}$ teaspoon salt and pepper, toss lightly. Garnish with orange slices if desired.