

Quandong

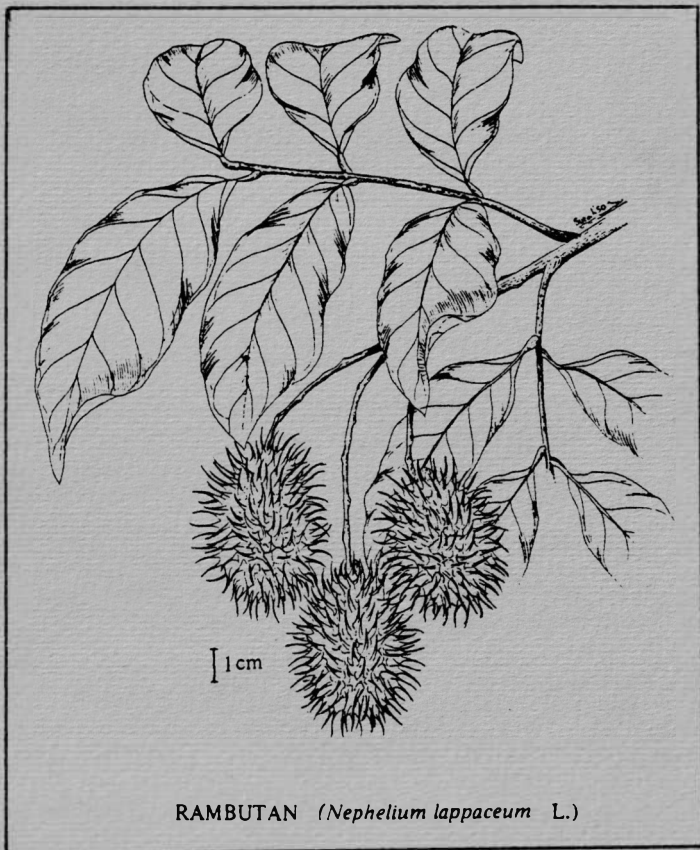
WEST AUSTRALIAN NUT AND TREE CROP ASSOCIATION

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RAMBUTAN (*Nephelium lappaceum* L.)

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NEXT MEETING - LANDSCAPES AND FRUITS OF INDONESIA

** Wednesday February 19: 7.30 pm **
(Naturalists Hall, 63 Meriwa St, Nedlands)

In January 1985, David Noel travelled through the Kalimantan (south Borneo) and Sulawesi (Celebes) areas of Indonesia, with brief stops in Java and Bali. In this talk he will show slides of the very varied landscapes, from low marshlands to high volcanic plateaus, and the varied tropical fruits and nuts he saw on the way. Highlights of the trip included a trip on a bamboo raft down a fast-flowing mountain river in east Kalimantan, and a visit to the Toraja area in Sulawesi where the people build the famous boat-shaped prow houses and have strange burial customs. Many exotic fruits were met with, some quite new to him, and many seeds were brought back to Perth and germinated successfully. This meeting will be open to the public.

NEW ON THE EXECUTIVE

At the last AGM we welcomed NEVILLE SHORTER to the Executive Committee. Neville is on the staff of the Department of Agriculture (OIC Midland Office) and is the Aggie's foremost expert on nuts.

At the last Exec Meeting, David Noel was reelected President, and EDNA AITKEN was elected to Vice-President. Edna has been a tireless supporter of the Association and did most of the hard work in getting WANATCA incorporated.

FIELD DAY : DAVID NOEL'S GARDEN & NURSERY Sunday April 6 : 2 pm

Around David Noel's home at 98 Herbert Road Shenton Park is a large garden and backyard nursery with many unusual plants. Members of WANATCA, Men of the Trees, and the Permaculture Association of W A have a rare chance to see this collection and hear about the techniques used and aims pursued in integrated tree crop development.

Features include: very wide range of species; close interplanting; large-scale composting (many tonnes/year); multi-storey plant architecture; fruiting pommelo, papaya, guava, pepino, macadamia, raspberry, carob, arbutus; 'natural' nursery; self-sufficiency in heating wood; and pleasant, functional layout.

Trees will be on sale at the end of the tour, and if you are coming from afar, the SE corner of Shenton Park Lake, 200 m away, is a good spot for lunch, with a gas barbecue, table, and water.

In vitro propagation of Corylus avellana

G. Thomson, T. Deering

Horticultural Research Institute
Victorian Department of Agriculture
Burwood Highway, Knoxfield

Expansion of Victoria's hazelnut industry is limited by a scarcity of clonally produced planting material of good cultivars. However, the high multiplication rates which can be achieved by in vitro micropropagation (i.e. plant tissue culture) may provide a solution to this problem.

In 1984 at least eleven laboratories worldwide were attempting to multiply hazelnuts in vitro (Lagerstedt, 1984). Most were having problems with contamination and poor multiplication, however, Dr W Anderson in the USA has produced promising results (Lagerstedt, 1984).

Work at Knoxfield began in February 1985 using the hazelnut shoot multiplication media developed by Anderson (1983), and the French workers Al Kai, Salesses & Mouras (1984). Explants for initial establishment consisted of apical meristems with 3-5 leaf primordia. Depending on the environment in which the stock plant was grown, up to 80% of the meristems were established free of contamination in culture by using a 15 min soak in 1% Zephiran^(R) solution. Anderson (1983) reports contamination rates for tree explants of over 90%.

The establishment success of tissue in culture, and subsequent multiplication of shoots depended partly on cultivar. Nevertheless, shoot multiplication on Anderson's shoot multiplication medium was generally good. Multiplication on the French medium was poor and often associated with callusing on leaf surfaces.

Root initiation was obtained in vitro using Anderson's shoot elongation/rooting medium. Shoots generally rooted within 10 days when cultured at $20 \pm 2^{\circ}\text{C}$ and a light intensity of 1500-2000 lux.

Rooted plants were produced from excised apical meristems in 55 days.

In spring 1985 it is hoped to establish and multiply in vitro some non-suckering selections, and recently imported cultivars.

References

- Al Kai, H., Salesses, G., & Mouras, A. (1984). Multiplication in vitro du noisetier (Corylus avellana L.). Agronomie, 4(4), 399-402.
- Anderson, W.C. (1983). Micropropagation of filberts, Corylus avellana. Proceed. I.P.P.S., 33, 132-137.
- Lagerstedt, H.B. (1984). Filbert production. Fruit Varieties Journal., 38(3), 95-100.

From 'The Garden' (UK), September 1985

Gevuina avellana

Gevuina avellana is an evergreen shrub or small tree in the family Proteaceae, native of Chile. It seems very much less familiar in gardens in Britain than other Chilean Proteaceae and is perhaps more exacting in its requirements. Here at Coleton Fishacre we have two thriving specimens, material from which has been seen at Vincent Square several times since my husband and I took on the restoration of the garden at Coleton Fishacre on behalf of the National Trust in March 1983. The younger of the two plants, a layer from the older one, has not yet produced flower or fruit, but its foliage is much finer; material from this plant – which is about 4m high – gained an Award of Merit when shown by us in November 1983.

The older plant, which is some 13m tall and has formed a multi-stemmed tree, apparently flowers with freedom each year. Certainly in the two years we have lived here it has both flowered and fruited profusely, and we showed material bearing both flowers and fruit at

the Great Autumn Show in 1984. The flowers are effective over a long period, from the bud stage in July/August, through to Christmas or even longer.

Like many proteaceous plants the flowers are intricately structured; their creamy white colouring shows up strikingly against the dark green glossy, pinnate leaves with their very variably-sized leaflets. The fruits are about the size of cherries and a bright red in colour. The kernel, when ripe, is pleasant to eat, hence the common name of Chilean hazel. The seeds germinate readily but we had great difficulty, in the appallingly hot and dry summer of 1984, in keeping them alive; *Gevuina avellana* clearly prefers the conditions it finds here in the garden, of sheltered woodland. The older plant is growing with its feet in a boggy patch of ground, beneath a tall *Cornus capitata* and next to a fair-sized *Magnolia kobus*. Growing very near it are plants of *Embothrium coccineum* and *Lomatia ferruginea*, all self-sown, making an interesting and handsome trio of Chilean Proteaceae. The younger plant is in a much drier position, beneath a canopy of sweet chestnut, birch and *Sorbus x thuringiaca*, with its compatriots *Crinodendron hookerianum* and *Drimys winteri* nearby.

JANE TAYLOR
DARTMOUTH, DEVON

Editor David Noel has put together a number of transcripts of great interest to growers of the 'new' fruits and nuts. Five chapters by four authors cover the reasonably well-known kiwifruit, mango, custard apple, and macadamia, through to the rare and universally unknown like Sapucaia nut, Nypa Palm nut, and the Australian Native Cashew, Semecarpus. Hats off to anyone who can describe all the last three without reference to this book. Authors are Warren Boucaut, David Noel, Dr J R Millington, and Mike Hawson. The editing has been done in such a way as to keep the conversational tone of much of the work.

A compact book of 84 pages, 'Tropical Nuts & Fruits' will be most used by commercial growers who are aiming to broaden their crops, and by home gardeners looking for something different to grow and eat. Both these potential purchasers are rapidly increasing in numbers. Some of the factors that explain the upturn in interest are overseas travel, recent Asian immigration, and the whole foods revolution. The media have focussed quite a deal on exotic fruits and nuts during recent months also. Many traditional orchardists are finding that old standbys like peaches, plums and nectarines are no longer attracting buyers. The successful example of the New Zealand horticultural industry must be an encouragement to try something different.

While not a handbook on how to grow each species, the book does contain current views on the potential for commercial development of many of these crops. As such it is a valuable guide to anyone about to branch out into the more exotic varieties. Some tropical fruits have succeeded so well that they are now regarded as temperate varieties - tomatoes are a good example. By drawing on the combined experience of those who have walked the path (in some cases, the plank!) of developing new crops, the way is made a deal easier. At \$9.95, 'Tropical Nuts & Fruits' represents good value and is recommended.

Neville Passmore, Blossoms Garden Centre

(Available from Cornucopia Press, PO Box 27,
Subiaco WA 6008, at \$10.95 including post)

THE WEST AUSTRALIAN FRIDAY JANUARY 3 1986 19

PLANT A PLUM INVESTMENT

DARWIN: A native Australian plant rich in vitamin C has interested Australian and foreign companies as a basis for a new range of processed health foods.

The fruit of *Terminalia ferdinandiana* has been shown to have the highest known naturally occurring level of ascorbic acid — about 50 times greater than oranges. About eight metres high, the tree is said to grow in areas of the Northern Territory and north-eastern WA.

Known in the NT as the "billy-goat plum," the fruit appears as a

small green berry about the size and colour of an olive.

It has a sour taste similar to the gooseberry and has long been known to Aborigines as a rich food source. Europeans have generally regarded it as unpalatable.

The plant has been championed by a Darwin food consultant, Mr Brian Woods, who believes that it could be grown commercially for health products including syrups, fruit drinks, jams, yoghurt, cereals and vitamin-C tablets.

Mr Woods began to collect wild specimens of the plant after a letter appeared in the British

medical journal *Lancet* in 1982 discussing the fruit's properties.

Two years ago he air-freighted 20kg consignments of the fruit to companies in Europe and the U.S. for further investigation.

In Australia the most interest has been shown by a Melbourne-based health food manufacturer, Glaxo (Australia).

The company sent representatives to Darwin and established trial planting blocks in different regions.

The fruit was renamed the Capricorn plum, a registered trademark.

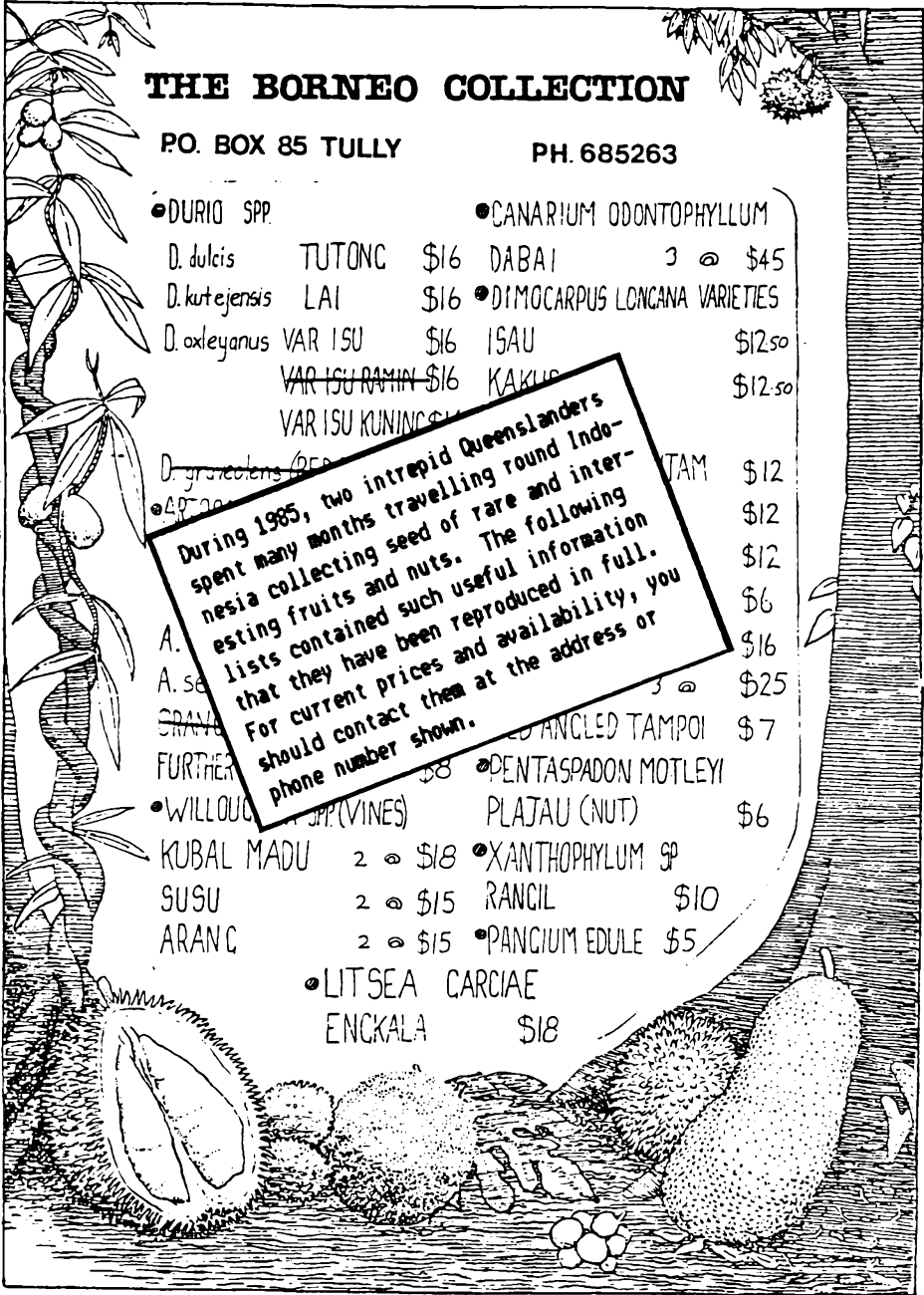
THE BORNEO COLLECTION

P.O. BOX 85 TULLY

PH. 685263

- DURIUM SPP.
 - D. dulcis TUTONG \$16
 - D. kutejensis LAI \$16
 - D. oxleyanus VAR ISU \$16
 - VAR ISU RAMIN \$16
 - VAR ISU KUNING \$16
 - D. graveolens (250)
 - D. ...
- CANARIUM ODONTOPHYLLUM
 - DABAI 3 @ \$45
- DIMOCARPUS LONGANA VARIETIES
 - ISAU \$12.50
 - KAKIUS \$12.50
- ... TAM \$12
- ... \$12
- ... \$12
- ... \$6
- ... \$16
- ... 3 @ \$25
- ... ANGLED TAMPOI \$7
- PENTASPADON MOTLEYI
 - PLAJAU (NUT) \$6
- XANTHOPHYLLUM SP
 - RANCIL \$10
- PANGCIUM EDULE \$5
- LITSEA CARCIAE
 - ENCKALA \$18

During 1985, two intrepid Queenslanders spent many months travelling round Indonesia collecting seed of rare and interesting fruits and nuts. The following lists contained such useful information that they have been reproduced in full. For current prices and availability, you should contact them at the address or phone number shown.



DESCRIPTION OF FRUITS

Durio zibethinus: DURIAN

Highly variable in the size, shape, colour, and quality of the fruit. It is usually 15 to 30 cm (6" to 12") in length, round to ovoid in shape, strongly smelling and has a thick, tough, green, yellow, or brown shell covered with hard, sharp pentagonal spines. There are 5 locules dividing the fruit, with 0-5 seeds per locule, surrounded with pearly grey, white, cream, or yellow coloured flesh. The flesh is thick and creamy in texture, sweet with a delicate fruity flavour overlaid with a sweet oniony quality--a pleasant and addictive combination. The durian is highly prized in Asian markets--in season, to the exclusion of all other fruits. A large tree in forest conditions but smaller under cultivation. Seedlings are erect in habit but grafted trees are shorter and more compact.

Durio oxleyanus: ISU

Isu fruits are small, round, green-shelled durians, often ripening to yellow. About 13 cm (5") in diameter, covered with long, sharp, needle-like pentagonal spines. The pale yellow flesh surrounds 1-3 mid-brown seeds in each of the 5 locules. The flesh is a degree thicker textured than *D. zibethinus* and somewhat dry like peanut butter. It has a good rich flavour, similar to the durian but less sweet and with a slight tangy aftertaste, like most durians. The shell does not smell strongly. It is easy to open.

Durio oxleyanus var.: ISU RAMIN

Outer form like Isu (13 cm round, green to yellow fruits, long sharp spines) 1-3 mid-brown seeds (but darker than Isu's) in each of the five locules. A deep yellow fleshed durian with a rich flavour, slightly sweeter than Isu, with a thicker texture and drier flesh, like a fruity peanut butter. Tastes a little nutty too. Strong-smelling shell.

Durio oxleyanus var.: ISU KUNING

An intermediate variety between Isu and Isu Ramin. Mid-yellow flesh that is soft, thick and delicious. The sweetness and flavour are intermediate also.

Durio kutejensis: LAI or NYEKAK

A small round to ovoid yellow durian with short, soft, pentagonal spines. It has a collar of whiskery hairs where the peduncle joins the fruit. The thick-textured orange flesh has a distinctive flavour, drier and firmer than Isu, sweetish but not as sweet or as strongly flavoured as *D. zibethinus*. It has a tangy aftertaste. The tree is smaller than other *Durio* species, and will bear fruit sooner (perhaps after 7 years in North Queensland). It could be a good rootstock for grafting.

Durio dulcis: TUTONG

A beautiful red globular fruit, usually 15-23 cm (6"-9") in diameter with very long, thin needle-like spines. The flesh is a very pale yellow, thick, creamy and delicious, soft and sweet like a good caramel with a flavour of pineapple cream (without the acidity). The sweetest of all *Durio* species. Shell smells strong.

Durio graveolens

An attractive globular fruit, 10-15 cm (4"-6"), covered with closely spaced, orange to light red spines which are sharp and needle-like. There are few seeds and the bright red flesh is very thick and creamy textured, with a lack of sweetness that gives it an agreeable savory quality. It can be eaten fresh or cooked with onions and seasonings and used as a side dish with rice and vegetables. There is very little odor to the shell. It is the only one of these durians that does not drop when ripe but must be picked when colored.

Artocarpus odoratissimus: TARAP (Philippines MARANG)

A large round to oblong fruit, 15-30 cm (6"-12") long, covered with hundreds of closely set, blunt, green or brown spines. The small (10 mm) seeds are surrounded by the creamy white flesh of each of the many pulpy segments. The flavour is sweet and juicy with a fibreless melting texture. A good breakfast fruit. The fruits develop a strong aroma after they ripen. The spines should snap when the fruit is ripe; they bend and exude latex when not ripe. Like all *artocarpus* the Tarap must be picked as it will not fall. The seeds are good to eat when fried.

Artocarpus integer: CHEMPEDAK

The Chempedak is like a small cylindrical jakfruit, but the skin is almost smooth with only small protrusions. Similar internal appearance to the jak, with smaller segments (2-3cm) surrounding each seed. The segments are attached to the central inedible core. There are two distinct types, one larger (30-45 cm) pale yellow fleshed fruit, another smaller (25cm) long with dark yellow flesh. Both have a very rich, sweet, juicy flavour and creamy texture. The smaller fruits are generally sweeter and creamier. A richer flavour with less fibre and acidity than jak.

Artocarpus integer: ORANGE-FLESHED CHEMPEDAK

A good flavoured Chempedak with sweet, creamy flesh and an attractive orange colour about 30 cm long.

Artocarpus sericarpus: PEDALAI

A typical artocarpus, globular, about 15 cm in diameter, with an attractive bright orange skin. Small soft protrusions sprout curly yellow hairs like a giant rambutan. Pedalai is similar to the Tarap inside but has a superior flavour, firmer flesh, and slightly larger segments. The sweet creamy flesh is easy to eat, and like the Tarap the segments cling to the central core when the skin is removed. As with all Artocarpus species the seeds are edible and those of the Pedalai are considered to be one of the tastiest.

Artocarpus Species unknown: ORANGE ARTOCARPUS

This fruit has bright orange skin with small soft protrusions, like the Pedalai, but hairless. Sweet, creamy, Tarap-like flesh.

Artocarpus kemando: PUDAU

Artocarpus sarawakensis: PINGAN

Artocarpus elasticus: TEKALONG

Smaller, Tarap-like fruits of milder flavour and less sweetness. Good quality edible seeds.

Dimocarpus longana var. malesiana: ISAU

A small round mid-green fruit about 25mm in diameter. The thin, brittle shell is covered with small bumps, and is easily opened. The translucent flesh is 4-6mm thick around a single black seed. The Isau is similar to the Longan, very sweet and juicy with a musky or melon-like flavour reminiscent of a very sweet watermelon. Easy to eat. Delicious!

Dimocarpus longana var. unknown: KAKUS

Kakus is another delicious Longan-like fruit similar in appearance to Isau, but with a yellow or yellow brown pebbly shell. Sometimes slightly larger than Isau. The sweet musky flesh is a degree less juicy than Isau but has a more distinctive smoky flavour--somewhat rockmelon-like.

Canarium odontophyllum: DABAI

A beautiful, upright tree with large pinnate leaves and clusters of olive-like fruits held above the dark green foliage. The Dabai fruits are a startling white when immature turning blue-black on maturity. They are oblong, 35-40 mm long by 20-25 mm wide. The white or yellow flesh under the thin edible skin is 4-7 mm thick and covers a single large triangular seed. The flavour is unique, the texture thick and oily (like a good avocado.) The fruits are prepared by soaking in hot (55° C.) water for about 10 minutes, until they soften, then eaten with a little soy sauce or salt with a meal or as a savoury snack.

Litsea garciae: ENCKALA

A relative of the Avocado, this wonderful little fruit is one of the welcome savoury changes from the usual sweet tropical fruits. The round fruit is oblate (flattened top and bottom) and usually 35-45 mm in diameter. The thin, edible skin is bright pink. Medium to thick flesh surrounds the single, large avocado-like seed (15-20 mm). This flesh is creamy white and avocado-like, but softer and with a more delicate flavour. It is prepared by bruising the fruit briefly--roll around a basket or hit it with the back of a spoon.

Xanthophyllum amoenum: RANGIL or NYALIN

Rangil is a small (5-6 cm) spherical fruit coloured dull green and yellow. The thick shell encloses about 10 translucent segments, each containing one small seed. The flesh is sweet and melting, much like Inga. The shell can be dried, powdered, and used as a very effective shampoo.

Willughbeia Species: KUBAL MADU, KUBAL SUSU, & KUBAL ARANG

This vine fruit can be grown on a trellis, and produces a heavy crop of round or pear-shaped (Kubal Susu) bright orange fruits, 5-10 cm in diameter. The flesh, which surrounds the large flat seeds, has a sweet tangy taste like orange sherbet. Kubal Madu is the sweetest species, and Kubal Arang the most acid. Kubal Susu is the largest.

Pangium edule: PANGI

A highly ornamental medium-sized spreading tree with dark green foliage and large round leaves to 50 cm across, lobed when the tree is young. The large, pendulous, orange-brown fruits contain many large triangular seeds embedded in an edible pulp. The seeds are also edible after special preparation.

Aglaia domesticum: LANGSAT

The best Langsats are about 3 cm long and 2 cm wide, and have a pleasant delicate flavour that make it a popular dessert fruit. The Langsat has translucent subacid flesh divided into several segments, most being seedless. It is a slow-growing and small tree which produces heavy crops.

Baccaurea motleyana: RAMBAI

Small (20mm) round to ovoid fruit with translucent flesh and several very small seeds. It is much like Langsat but more acid, juicier, and later in season. The fruits are borne on the female trees only in very long, loose panicles. A normal crop on a Rambai tree could carry thousands of fruit. The leaves are large.

Baccaurea costulata: TAMPOI

There are about a dozen species of Tampoi in Borneo, varying in quality--some quite acid. These orange Tampoi are one of the best. Tampoi is a small fruit (50-63 mm), round, slightly oblate, dull orange. The thick shell splits easily to reveal 6 glossy orange segments arranged in pairs. The sweet flesh melts, a small amount clinging to the small, flat seeds. It is like a tangy juice, perhaps apple. Plant 3 of these small trees together to ensure fruit. Fruit borne on trunk & major branch.

Baccaurea angulata: AJONG or RED ANGLED TAMPOI

This is a somewhat sour Tampoi, but has a beautiful, 5-angled, bright red appearance. It hangs on the trunk and larger branches in such profusion as to coat it to ground level, at times, with its bunches.

Pentapladon motleyi: PLAIAU

The kernel of this nut is shaped like an almond, but more flattened, 20-25mm long. When fried they have a pleasant taste. There is an irritating property in the sponge-like shell, so care should be taken in opening them. The medium-sized tree grows beside rivers subject to periodic flooding and the fruits float.

Nephelium mutabile: MERITAM (West Malaysia PULASAN)

Meritams are borne in panicles on a rambutan-like tree. The fruit is also rambutan-like, but is hairless, being instead covered with small protuberances. It is softer, juicier and more acid than a rambutan, and quite sweet. Very refreshing. There are Green, Yellow, Dark Red, and Purple varieties.

Nephelium Maingayi: LAIT

A small (35 by 25 mm) sweet and juicy rambutan-like fruit, slightly acid with a hint of mint. Delicious.

Nephelium sp.: PANGKAL

Often sour, but this variety was sweet when fully ripe. Round, bright red fruit 5 cm in diameter covered with short dense hairs.

Nephelium sp.: SIBAU

Like a small Rambutan, good flavour, sweet.

Christian Leaders' Training College of Papua New Guinea Inc.



"Serving the Churches of the South Pacific" (1981)

Principal : Rev. Joshua Daimoi, B.A. (Hons), LTh., T.M.
Vice-Principal : Mr. Adrian Rickard, LTh., TPTC.

Postal Address: P.O. Box 382, Mt. Hagen,
W.M.P. Papua New Guinea
Telephone : 562311 562312

25 November 1985

West Australian Nuts'
Tree Crop Association
P O Box 27
Subiaco, W.A. 6000

Dear Sirs,

I was given your address by a colleague in South America and I wonder if you could assist me in obtaining and locating supplies of tropical and subtropical/temperate fruit trees, vines and plants that we could grow at CLTC and then distribute to villages and students that we have here.

The climate of the College is temperate with a rainfall of approx. 60 inches per year evenly spread throughout. The maximum temperature is 30°C and minimum 15°C, this is constant also throughout the year.

We have students from the warm tropics in coastal areas as well as the highlands but most plants grow well here. We have bananas, pawpaw, avocados, breadfruit, coconuts and mangoes in the country but are looking for other tree fruits.

Yours sincerely

Dr J L Rogers
DEAN - Faculty of Agriculture

JLR in

Q: WHAT'S HAPPENING
ABOUT THE 1985
YEARBOOK?



West Australian Nut & Tree Crop Association.

(Incorporating the West Australian Nutgrowing Society.)

P.O. Box 27, Subiaco, Western Australia 6008

1986 January 29

Dr J L Rogers
Dean, Faculty of Agriculture
Christian Leaders Training College of PNG
PO Box 382, Mt Hagen, WHP
Papua New Guinea

Dear Dr Rogers,

Thank you for your letter regarding supply of tropical and subtropical tree crops for establishment in Papua New Guinea.

I am sure that we will be able to be of some assistance. Our Association is especially interested in the establishment of new nut, fruit, and other tree crops and is keen to build reciprocal relationships with relevant organizations overseas. We have members and exchange partners all over the world, in every sort of climate and terrain. Naturally our first interest is in Western Australia, but our home State itself includes a vast range of climates from moist tropics to cool temperate.

Most of our exchange partners sent us their publications in exchange for ours, however in your case a variant arrangement may be better. Papua New Guinea contains, as you will be well aware, a vast store of useful native plant species. We would welcome the exchange of both information and of plant material with you. We would very much like to obtain seed of the Highland pandanus nut species, of the Bukbuk fruit (*Burckella obovata*), the nut *Finschia chloroxantha*, and others. Species introduced here which seem to be doing well include the white sapote (*Casimiroa edulis*) from the Mexican highlands, and the nogal or tropical walnut from the Ecuadorian highlands. Both should be well suited to Western Highlands Province conditions.

I look forward to your response to this proposal, and hope that it will initiate a relationship of mutual benefit to our respective organizations.

Yours sincerely

David Noel (President)

A: Together with our friend Rupert Murdoch, we are heavily involved in the introduction of new print technology : production of the 1985 Yearbook is being done on a laser printer, working from word processor files. It's been a struggle, but we are almost there -- if you don't get the WANATCA YEARBOOK with this Quandong, it will follow very shortly (if you subscribed for 1985).

'Chocolate' fruit

CAIRNS (Q) has become the unofficial capital of Exotic Fruit Land . . .

And from there many new sweet recipes are evolving.

For instance, Mrs Lois Christensen from Kewarra Beach, 20 kms north of Cairns, has recipes for making chocolate cake, chocolate mousse and chocolate ice-cream, using the black sapote, commonly called the chocolate pudding fruit.

Mrs Christensen has two young daughters and a husband with a sweet tooth, so she set out to combine natural fruits as traditional sweets. Now the family are converted to her recipes.

When the Christensen's moved to Cairns in 1981 from Tennant Creek in the Northern Territory, they were unaware that the home they purchased at Kewarra Beach had some of the rarest exotic fruits from South America and Asia, planted there by the previous owner.

However within two years, many of the trees started to bear fruit. It was then they realised what a bonanza they had on their half-acre.

Exotic fruit trees such as grumichana cherry, mamey americana, black sapote, purple star apple, exotic mango, lychee, Malay apple, rose apple and Barbados cherry, all flourish there.

Hardly a month goes by that Mrs Christensen can't put together a mouth-watering fruit salad straight from her garden.

For the sweet tooth, the chocolate pudding fruit or black sapote is a winner.

It is a native of Central and South America and was introduced to Australia a decade ago. It thrives in the warm tropical climate of North Queensland.

When ripe the black sapote is 100 to 150 mm in diameter

and is round in shape and green in color.

Once opened a dark brown flesh is revealed with the consistency of chocolate mousse.

A Sydney business woman with a flair for the unusual recently hosted a luncheon for her friends.

She had a box of black sapote flown in for the occasion and with a little rum liquor mixed in and topped with whipped cream, she treated them to a dessert which was the topic of conversation for weeks later.

We should see black sapote along with many other exotic tasting fruit appearing on supermarket shelves in the near future.

If you fancy your sweet tooth, the following are two of Lois Christensen's favorite recipes:

BLACK SAPOTE MOUSSE

500 grams black sapote pulp
3 heaped tablespoons of full cream milkpowder
2 tablespoons of white sugar
2 teaspoons of vanilla
2 teaspoons of cocoa-powder
1/3 cup of fluid milk.
Beat well together.
Serve thoroughly chilled or frozen.

BLACK SAPOTE CHOCOLATE CAKE

¾ cup black sapote pulp
2 cups of self-raising flour
½ cup of sugar
½ teaspoon of bicarbonate of soda
2 teaspoons of cinnamon
½ cup of sultanas
2 tablespoons of cocoa
Mix all well together.
Then add 1 tablespoon of butter (or margarine) and 1 cup of water (heated together till very hot).
Mix well.
Cook in moderate oven for 40 minutes or microwave in ring dish for 8½ minutes.

Stop licking your lips and put the oven on . . .

— RUSSELL FRANCIS

Dr Bobby Tee, Rural Development Corporation, Sabah, Malaysia

Rambutan (*Nephelium Lappaceum* L.),
fruit and nut crop of tomorrow

Rambutan (*Nephelium Lappaceum* L), a member of the more common fruits litchi (*N. Litchi*) and longan (*N. Longana*), is widely cultivated in Southeast Asia and even northern Australia. It has not attracted commercial interest because of its relatively slow growth and enormous variability.

Recent research efforts have identified promising cultivars and use of vegetative propagation can bring rambutan plants into production within three years.

Changing conditions in Southeast Asia and indeed in other parts of the world are creating demand for exotic tropical delicacies. Rambutan has a tremendous potential as a desert fruit (the aril) and a nut (the seed).

The oval rambutan fruit (8-10 cm) has hairy outer rind 2-3 mm thick. The colour of the hair and rind varies from dark red to pleasant yellow, crimson colour being most common. The fruit has a single semi-hard seed with the fleshy white aril between the seed and rind. Thickness of aril and size of seed vary.

The quality of the aril are exceedingly variable. Many are sour with soft aril. Selection studies have isolated cultivars with large fruit, firm aril pleasantly sweet to taste and free stone. These characteristics make the fruit suitable for canning and the seed favourable as desert nuts.

Early tests have indicated that the fat content of the seed constitutes 17 percent of dry weight and the chief constituent acid is oleic. It is the lack of large scale cultivation that limits availability of commercial amount of quality fruits and nuts for processing. It is now feasible to organise plantation of rambutan to utilise the technology of today for tomorrow.

Grant boosts tree research

A FEDERAL Government grant of more than \$1 million will help researchers develop a tree-export industry worth more than the Australian dairy industry within 10 years, according to a nursery owner.

Mr Adrian Bowden, of Perth, said that the research could also provide a major breakthrough in the reclamation of WA's salt-affected farmland.

Mr Bowden is one of the

key figures in Alcoa's research programme.

Alcoa, CSIRO, the University of WA and Murdoch University are taking part.

Mr Bowden will be responsible for marketing.

Alcoa's senior environmental scientist, Mr Dave Kabay, said yesterday that the work involved cloning tree species to produce a variety tree with abnormally-high resistance to salt.

Rambutan and its Relatives

Some fruits of the Sapindaceae family seem to be indigenous to the Philippines; these are found in wild or semi-wild state and very little attempt has been made to domesticate them.

Mention may be made of the kubili, the alpay, and the bulala. Perhaps, one of the reasons why these fruit trees have not been put under cultivation is the fact that the fleshy or edible portion of their fruit is lean and hard to separate from the seed, and the quality is poor. The kubili, on the other hand, which is a nut in reality may be developed as a substitute for the chestnut although it has a poor keeping quality.

Introduction works of the Bureau of Plant Industry and the College of Agricul-

ture have yielded promising Sapindaceae fruits that are highly desirable and will no doubt become an important item of our fruit industry. I have reference to the rambutan, kapulasan, longan, and the litchi, particularly the first two and perhaps, the last one. These fruits have impressed people who have tasted them; they have the highly desirable blending of a little sour taste and sweetness, common to grapes and to lanzones. The first two fruit emigrants seem to be well adapted to some sections of the country and people are beginning to be more in-

By P. A. RODRIGO

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terested in their culture. On the other hand, the litchi tree grows well from sea level to high altitude, but it was only lately that some varieties have been found to fruit at certain elevations here.

THE RAMBUTAN

The rambutan, *Naphelium lappaceum*, is a medium sized tree, reaching a height of about 10 to 12 meters with spreading loose branches if propagated vegetatively. When grown from seed it tends to develop straight trunk with a dense crown and may attain a height of 20 meters. Rambutan is a native of Southeast Asia with varieties from Indonesia, Malaya, Indo China and Thailand. The original trees found in the Philippines are wild or undomesticated and are called "suare" of "usau," both terms supposedly of the Sulu dialect. The Indonesian name "rambutan" has been adopted in the Philippines, perhaps because the first cultivated tree was imported from Indonesia.

The leaves are borne on petioles with 2 to 4 pairs of leaflets set alternately along a rachis which ends with a leaflet too. The flowers are borne on erect and widely branched panicles which are either terminal or axillary. The flower panicle may bear both male and female flowers or all male or all female. The cultivated

rambutan is usually monoecious, that is, it has both the male and female flowers in the same panicle. The fruits which take about 3-1/2 to 4 months to develop to maturity are covered with thick and long recumbent spines or protuberances which upon ripening turn to light or deep red color. It is a sight to see; brightly colored fruits in bunches ranging in number from a few to as many as over 20 fruits in a cluster. Each fruit has a seed embedded in a translucent pearly whitish flesh or pulp which is the edible portion of the fruit. The pulp either clings or separates easily from the seed, depending upon the variety or strain, and may be sub-acid to sweet in taste with a very desirable flavor. The edible portion varies from 40 to 50 percent of the fruit by weight.

Most of the cultivated rambutan trees in the Philippines were introduced from Indonesia, either as seed or as budded seedling. Lately, some have been introduced from Malaya and Thailand.

It may be stated in this connection that seedling rambutan trees are very variable and that is why there are now at least three types of trees found in the country: (a) non-bearing trees, (b) shy bearing trees and (c) prolific trees. Some studies show that about two-thirds of trees propagated from seed are male or non-bearing trees.

In Mindoro, for example, seedling trees that originated from a good quality tree in the Lamao Experiment Station came out mostly to be of poor quality trees with distinctly subacid pulps which do not separate from the seed, and therefore even if sweet would not be desirable. The UP College of Agriculture was more lucky in its plantings of rambutan seedlings. A number of seedling trees of fine quality fruits have been selected.

Introductions made after World War II were of finer quality. These were budded seedlings and were of the monoecious

type, that is, they bear both pistillate and staminate flowers in the same flower panicle, thus are self-pollinating. The pulp which separates easily from its seed is thick, juicy and sweet with a pleasant desirable flavor.

In most commercial varieties, the pulp separates readily from the seed but with great portion of the testa adhering to the flesh. To most consumers this does not matter, although, this is objectionable to the fastidious consumers. The ideal variety or strain is one whose pulp separates readily from the seed with no testa going with it. In this case, the testa sticks to the seed itself.

Soil and Climatic requirements — The rambutan as has been observed in the Philippines can be grown in many types of soil provided the drainage is good. Deep sandy loam to clay loam soils seem to be preferable. But even rather shallow soil with broken calcareous subsoil as is obtaining in the Manila suburbs if kept moderately moist during the dry season will grow good rambutan. Some rambutan trees in San Juan, Rizal, that I have seen fruit well and regularly too like those in Lamao, Bataan, and in Los Baños, Laguna.

What appears to have a much greater influence on the development and fruiting ability of the rambutan tree is the climate. The tree is not as drought resistant as the chico, caimito and mango. In the case of rambutan seedling, once it wilts, it will not recover any more. Areas that have a more or less even distribution of rainfall are better adapted to the growing of rambutan. Trial plantings in Davao and Oriental Mindoro have produced excellent development of rambutan trees. But even in areas with long dry season like Bataan, rambutan once established will grow well, especially if the water table is not very deep. It is better yet if the trees could be irrigated during the dry months.

In Indonesia, the rambutan is claimed to be raised commercially from almost sea level to around 300 meters elevation. In the Philippines, the trees that are growing successfully are those planted from almost sea level like those at the Lamao Experiment Station to 300 meters as in the Davao Experiment Station. So far, no rambutan trees have come to the knowledge of the author that have been successfully grown in regions higher than 750 meters in elevation. It is not yet known whether rambutan could be successfully grown in Northern Luzon.

Propagation. — It has been stated earlier that rambutan seeds and — budded plants have been introduced here which means that the plant is being propagated by seed and by vegetative means. The value of vegetative propagation especially to crops that are very variable like the rambutan is so well known, so that it should be propagated by asexual means. Furthermore, besides being very variable, it has been found in a planting of seedling trees that about two thirds came out to be male. Propagation by budding and inarching are the best using rambutan seedling as root stock. For big planting, budding would be better on the standpoint of economy. The tree is not adopted to marcotting as rooted branches when set in the field die out.

Some claim that bulala and kapulasan seedlings make good stock for rambutan. Its seedling would, nevertheless, serve better. In the first place, rambutan seed is much more abundant and easier to secure and in the second place its seedling will be ready for budding or inarching.

Flowering. — Rambutan seedling trees reach fruiting stage in 7 to 12 years depending on the vigor of the tree while budded or inarched trees in 4 to 5 years. Some vigorous growing budded trees under full sunshine have been

known to start fruiting in 3 years after planting.

The rambutan flowers and bears fruit once a year. The flowering and fruiting season varies somewhat in different regions and is partly affected by the earliness and lateness by the rainy season. Where there is an even distribution of rainfall, the fruiting season is earlier. In Davao, rambutan flowers in March to April so that the fruit ripens in late July to early September. In Los Baños and Lamao, flowering generally comes in May and June and the fruit ripens in September to October. The trees in my backyard at San Juan, Rizal, when watered during the height of the dry season, flower in May and the first fruits ripen in late August to September.

The fruits are borne on a panicle, and if the setting is good, several fruits will be in a bunch and thus appear very attractive when they turn red upon ripening. As the fruit ripens, the spines become red first and later the whole covering turns red to dark red or yellowish red, depending upon the variety or strain.

In harvesting, the whole panicle should be plucked. For home consumption, however, selective picking of the fruits may be practiced. When shipped for the market, picking of the fruits in panicle has its own advantage in that the fruits are not so compact in the crate and allow better aeration thus preventing the heating of the fruit when in transit. Some allowances, however, should be provided on the panicles when weighing.

In Indonesia, aside from the pulp for which it is raised, an edible low melting oil can be extracted from the seed. In rural areas, this oil was used for lighting.

KAPULASAN

“Kapulasan,” *Nepelium mutabilis*, is

the Indonesian name for the fruit. This fruit is locally known as "Bulala" but the Indonesian name "kapulasan" has been adopted here to give a little glamour to a fruit tree that is little regarded in this country because of its poor quality. The kapulasan that has been introduced here is of fine quality that people who have sampled it are generally unanimous in judging it as superior to the Chinese litchi which is greatly demanded in this country.

The kapulasan is a fruit adapted to low areas from sea level to 300 meters elevation although the finest ones in Jakarta are raised at 230 to 300 meters above sea level. It prefers a fairly well distributed rainfall or one with short dry spell. It is, however, more resistant to drought than the rambutan.

Its soil requirements are similar to those of rambutan, sensitive to standing water and to waterlogged condition of the soil. It responds well to deep well-drained soil of good fertility.

The kapulasan is a small to medium sized tree, smaller than rambutan. When propagated from seed, both male and female plants are produced. The fruits are also borne on loose terminal panicle like those of the rambutan, slightly bigger with pointed and thickly set pro-tuberances or spines. Upon ripening the rind and its pro-tuberances turn red to deep red or blackish red. The whitish flesh or pulp which is sweet to subacid separates readily from its embedded seed. The seed contains oil that is edible and can also be used for lighting.

There are a few commercial varieties in Indonesia, among which include Koeneng, Merah, Poetih and Sibabat. The successfully introduced kapulasan here was a budded plant but its variety name could not be ascertained. However, it is of fine quality, and it is suspected that it

is of the Sibabat variety.

Because of its known variability, the kapulasan should be propagated asexually. It responds to budding, inarching and marcotting. For the beginner, marcotting and inarching are recommended. Kapulasan seedling should be used as stock; rambutan could not be used. Whenever possible use monoecious trees, otherwise some male trees should be planted among purely female trees as sources of pollen grains.

The kapulasan tree should be set in the field at 8 to 10 meters apart. In the backyard, it may even be planted closer together. The asexually propagated kapulasan has been observed to begin fruiting in 3 to 4 years after planting. The seedling tree comes to bearing in 7 years under favorable conditions. The flowering season is May to June and the fruits ripen in September to October. The fruit turns red to even blackish red when it ripens. The fruits in a cluster ripen more or less uniformly and therefore the whole cluster is cut upon harvesting. This is advantageous because in packing the fruits in "kaings" or carbon boxes they are not compacted and therefore there is plenty of aeration thus preventing unnecessary overheating in transit.

This is a fruit emigrant that should be planted more extensively and widely especially in regions with fairly well distributed rainfall. It certainly is a good addition to our fruit diet, and is one that will readily be liked by the people.

ALPAY

Alpay known in science as *Euphoria didyma* Bo. is a native of the Philippines. It is known as alpay, alupay and alupag in Tagalog, bolit and bolik in Visaya; apalung and akulao in Ilocano. It may be known by some other names in other dialects. It is a medium sized tree reach-

ing a height of 8 to 12 meters. The leaves are pinnate with pointed rather narrow prominently veined leaflets. The flowers are in compact clusters borne like those of the mango. The fruits are rounded, green and warty attaining a diameter of about 2 cm. with a shell-like rind. The meat or pulp which envelopes a big seed is thin, but juicy translucent, and sweet with an agreeable flavor.

The tree is found growing wild and is so far hardly cultivated. It is of wide distribution in the country both in dry and humid regions. It flowers in February to March and the fruit ripens in May to June. A tree with a comparatively thick pulp has been reported and it is probable that some trees of good quality may be found. Some efforts should be exerted to locate some of these better strains and propagate them asexually and domesticate them.

KUBILI

The scientific name of kubili is *Cubilia blanco* Bl. and is known in Tagalog as Kubili, ibuli and lubi-lubi; atilang in the Mt. Province and tabas in Visayas. This tree is a native of the Philippines. It is of medium size with a height of 8 to 10 meters. The small flowers are borne on terminal clusters which later set into oblong bright green fruits with soft spines. Each fruit produces one roundish-oblong seed or nut about 3 cm. long of excellent quality and flavor when boiled or roasted like the chestnut. It is claimed by some horticulturists to be one of the best flavored nuts.

The tree is hardly domesticated although is found growing wild in many regions of the country although not abundant. The kubili tree is claimed to be more commonly found in the provinces of Laguna and Cavite. Like in the case of alpay, the better quality of kubili in existence should be propagated and do-

mesticated before they become the unfortunate victims of kaingineros. The Bureau of Plant Industry and the colleges of agriculture in the country should wake up to this reality to supplement more vigorously their efforts of fruit introduction by domesticating wildly growing native fruits, kubili being one of them.

Judged from its size, Kubili should be planted about 10 to 12 meters apart. It is easily propagated by asexual means, by budding and inarching. The flowering season of kubili is from November to January and the fruits or nuts mature in March to June. In some areas like Zamboanga, some kubili fruits mature as late as September. Unlike the chestnut, the kubili nut does not keep long under ordinary room conditions for storage.

LITCHI

The litchi tree, *Litchi chinensis* So, is known locally as litchias. This is a beautiful medium sized tree with abundant shiny foliage. Its leaves are pinnate and the leaflets are in pairs, 2 to 4 on a rachis



Litchi fruits.

which terminates, with a narrow and pointed leaflet. The flowers are small and inconspicuous but are borne in abundance in terminal panicles. The fruits which are oval or obvate are developed in loose clusters. They are small, about the size of Ciruela, 2.5 centimeters in diameter, deep rose to red when ripe, the rind warty, thin and brittle and is easily separated from the pulp or edible portion. The pulp which encloses a single brown seed is translucent, whitish, juicy, subacid to sweet of a pleasant taste and flavor. Eaten out of hand or can be dried or preserved in syrup.

This fruit tree has been introduced into the Philippines mostly from South China both by the Government and some private individuals; the ripe fruit used to be imported freely. Some trees over fifty-years old are growing luxuriantly at the Bureau of Plant Industry Lamac Experiment Station but these trees have never flowered. A tree planted by a naturalized Chinese in Bauko, Mt. Province before World War II fruited a couple of years ago. Also, one of three marcots introduced from China and planted at the Lamac Experiment Station has started fruiting four years after planting. So far the tree at Bauko bears fruit regularly but the one at Lamac is erratic in its bearing. The Bureau of Plant Industry collection at its Baguio Experiment Station should bear watching.

According to literature, litchi grows best in deep loamy soil with good drainage. In China, it is claimed that litchi trees are planted along irrigation canal. Efforts to simulate this practice in Lamac by running an irrigation canal along where some old litchi trees are growing have not so far induced the trees to flower.

It appears apparent from the few litchi bearing trees here that more emphasis

should be given on the varietal adaptability in the search for trees that will fruit in this country. The few trees that have already fruited here should be propagated both by seed and by vegetative means and grown at the elevations under which they have fruited. The problem is to multiply them and prevent their dying out. These trees are certainly very good sources of materials for wider testing of their adaptability to different elevations and regions especially in northern Luzon. These trees would be good materials for breeding purposes.

LONGAN

The longan, *Euphoria longana* Lank, is a medium sized tree, attaining a height of 12 to 15 meters with spreading branches when grown in the open. The leaves are compounded with 3 to 6 pairs of leaflets set opposite each other along a rachis which terminates with one leaflet. The small flowers are axillary borne on inflorescence on which fruits, singly or in bunches, may develop. The fruit is rounded to oval, with similarity to litchi fruits. The pulp which encloses a single seed is translucent white with an agreeable subacid to sweet taste. The fruit can be eaten out of hand or preserved like litchi.

The longan is one of the *Sapindaceous* fruits that was introduced into the Philippines even earlier than rambutan and kapulasan. Some of these early introductions have fruited but they failed to interest the public. It is a fruit tree that is grown commercially at low to medium elevation in Thailand. This tree has practically the same soil and climatic requirements of those of rambutan. It is propagated vegetatively for commercial planting and by seed for possible improvement.

West Australian Nut & Tree Crop Association

PO Box 912, Perth

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CALENDAR OF EVENTS 1986

(General Meetings are held quarterly at the Naturalists' Hall, No. 63 Meriwa Street Nedlands, at 7.30 pm on Wednesdays)

FEB 19	Wed	General Meeting (David Noel: LANDSCAPES & FRUITS OF INDONESIA)
APR 6	Sun	Field Day (David Noel's garden)
APR 8	Tue	Executive Committee
MAY 21	Wed	General Meeting
MAY 22-25		ACOTANC-3 Conference, Auckland
JUL 8	Tue	Executive Committee
AUG 20	Wed	General Meeting
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Members wishing any matter to be considered at an Executive Committee meeting should contact the Secretary by 2 days before the meeting.

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This book is not a handbook on how to grow tropical nuts and fruits in the tropics; instead, it contains some current views on a much wider field. It looks at nut and fruit crops of non-tropical origin which are currently showing themselves elsewhere in Western Australia, those which are currently showing promise, and those which may be of value in the future.

Special emphasis is given to the development of suitable microclimates and conditions for these tree crops. Unlike traditional temperate tree crops, those of tropical and subtropical origin are often grown in cooler areas or plantings sometimes quite close to those which they produce in their native development of tree tree crops, they are the vigour and birds of paradise horticulture, not the dogs and sheep produced by centuries of domestication.

This book looks at growing these crops in cooler parts of the State, as well as in the tropical areas but are now accepted as temperate crops. Being of tropical origin, and selection and breeding can transform an inferior, or grafted, tropical tree crop to a valuable warm-temperate one, if the future is sufficiently variable, and selection and breeding can transform an inferior, or grafted, tropical tree crop to a valuable warm-temperate one, if the necessary urge and perseverance are present.

Attention is also given to the economic value and potential of these crops; some fruits grow easily anywhere, but may not be a marketable proposition, others require detailed attention but have financial returns to be made no doubt plenty of future success stories and failures both in this field. These are food products full of interest and delight, full of opportunity and pleasure. The book is an invitation to explore, armed with some helpful comments from those who have gone part of the way before. Good luck!

ADDITIONS TO LIST

FEBRUARY 1986

- 254A AGROFORESTRY IN AUSTRALIA. New edition. Reid & Wilson (Aust, 1986). ca 240p. Pb. Updated version of this highly praised book, due around June 1986. Recommended. *\$28.00
- 256C COLLINS GUIDE TO TROPICAL PLANTS. Lotschert. (UK, 1983) 256p. Hb. Useful reference work, translated from the German original, 274 colour photos, many fruits. Recomm. \$16.95.
- 221F FOREST FARMING. Douglas & Hart. New ed. (UK, 1984). The widely-acclaimed story of the importance of tree crops in ecology and economy. Valuable species lists. Highly recommended for the overall picture. \$18.95.
- 251F FRUITS OF INDIA : TROPICAL & SUBTROPICAL. Bose (India, 1985). 637p. Hb. A publishing landmark, authoritative, detailed coverage of 23 fruits, including mango, papaya, litchi, sapodilla, ber, phalsa. Highly recommended. \$59.75.
- 249H HOW TO GROW CAROBS. Esbenshade (Aust, 1986). 160p. The long-awaited guide, due around May 1986. *\$18.00.
- 248K KAIKAI ANIANI: A guide to bush foods, markets and culinary arts of Papua New Guinea. May (Aust, 1984). 192p. Hb. Colourful and informative guide. Recommended. \$21.95.
- 257N NUTS! : A cookery book for nut lovers. Allison (UK, 1984). 93p. Hb. Attractively produced. \$9.95.
- 252P PINON PINE : A natural and cultural history. Lanner (US, 1981). 208p. Pb. The story of the west American nut pines, some references to other world species. *\$11.00
- 258P PLANT WORLD. Lambert (UK, 1978). 67p. Hb. All-colour, large-format introduction to botany and horticulture, excellent value at special price of \$4.95.
- 255S SEED FINDER. Jeavons & Leler (US, 1983). 152p. Pb. Good compendium of U.S. seed sources, useful variety information, mostly vegetables and fruits (some rare). \$8.95.
- 258P SEX LIFE OF PLANTS. Bristow (UK, 1979). 228p. Hb. A fascinating study of weird and wonderful plant pollination, an important factor in successful fruiting. Special: \$5.95.
- 197T TREE CROPS 84 : GROWING UP : ACOTANC-2 Conference Proceedings, Melbourne, 1984. (Aust, 1985). 239p. Pb. Valuable record of the 33 contributions to the 2nd Australasian Conference On Tree & Nut Crops. Recommended. \$18.95.
- 187T TREES FOR DARWIN AND NORTHERN AUSTRALIA. Hearne (Aust., 1975). 174p. Hb. Good practical guide, includes about 50 tropical fruits and nuts, illustrated. Recommended. \$8.20
- 253T TREES OF SOUTHERN AFRICA. Palgrave (S.Afr., 1977).-959p Hb. Marvellous book giving detailed description, figures, distribution, of every tree and shrub species in the 7 countries. 314 colour photos. Highly recommended. *\$32.00.
- 198T TROPICAL NUTS & FRUITS FOR WESTERN AUSTRALIA. (WA,1985) 84p. Pb. Five papers on the introduction of fruits and nuts of tropical origin into all parts of W.A. \$9.95.
- 250W The WALNUT REPORT (NZ, 1985). 101p. Pb. 10 papers on current matters from the New Zealand Walnut Action Group. Gives insight into state of the industry there. *\$11.00

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170C	CHECKLIST OF ECONOMIC PLANTS IN AUSTRALI	5.00	107H	HYDROPONIC GARDENING	13.95	162S	SUPPLEMENT TO PALMS OF THE WORLD	38.30
176C	CHRISTCHURCH 1982 : NZTCA	5.95	172H	HYDROPONICS A BALANCED VIEW	9.95	101T	TEXAS PECAN ORCHARD MANAGEMENT HANDBOOK	25.00
182C	CITRUS	9.95	178I	INTRODUCTION TO PISTACHIO GROWING	3.50	181T	TOXIC PLANTS OF WESTERN AUSTRALIA	7.50 O
108C	CITRUS IN THE HOME GARDEN	1.20	184J	JOJOBA HANDBOOK	13.40	168T	TREE & SHRUB EXPERT	6.95
188C	COLLECTING & TESTING TROPICAL FORAGE PLA	7.00	248K	KAIKAI ANIANI	21.95	197T	TREE CROPS 84 : GROWING UP : ACOTANC-2	18.95
256C	COLLINS GUIDE TO TROPICAL PLANTS	16.95	104K	KIWIFRUIT CULTURE	8.95	180T	TREE CROPS THE 3RD COMPONENT	22.00
103C	COMMERCIAL ALMOND GROWING	4.35	189K	KOLA	7.80	187T	TREES FOR DARWIN & NORTHERN AUSTRALIA	8.20 O
191C	COMMONSENSE GARDENING IN AUSTRALIA	5.70	113M	MACADAMIA POWER IN A NUTSHELL	4.65	253T	TREES OF SOUTHERN AFRICA	32.00 C
241C	COMPLETE AVOCADO COOKBOOK	4.95	238M	MACADAMIA CULTURE	1.35	202T	TROPICAL LEAF VEGETABLES IN HUMAN NUTRIT	12.95
111C	COMPLETE BOOK OF FRUIT	9.95 \$	119M	MAJOR WINE GRAPE VARIETIES OF AUSTRALIA	3.50	198T	TROPICAL NUTS & FRUITS FOR WA	9.95
117C	COMPOSTING AND ORGANIC GROWING	1.20	125M	MANUAL OF TROPICAL AND SUBTROPICAL FRUIT	41.10	115T	TROPICAL TREE CROPS	4.95
204C	COOKING WITH CAROB	2.95	131M	MINOR WINE GRAPE VARIETIES OF AUSTRALIA	6.00	213T	TROPICAL TREE FRUITS FOR AUSTRALIA (HB)	33.85
123C	COOKING WITH MACADAMIAS	5.70	137N	NEW SUNSET WESTERN GARDENING BOOK	12.95 O	214T	TROPICAL TREE FRUITS FOR AUSTRALIA (PB)	26.15
242D	DECIDUOUS FRUITS & VINES: PESTS & DISEAS	34.95	220N	NEW ZEALAND KIWIFRUIT COOKBOOK	4.95 O	121U	USEFUL WILD PLANTS IN AUSTRALIA	5.95
129D	DICTIONARY OF ECONOMIC PLANTS	51.50	143N	NUT TREE CULTURE IN NORTH AMERICA	26.40	127V	VEGETATION HUMID TROPIC REGIONS N QLND	5.00 O
106D	DISCOVERING HYDROPONIC GARDENING	9.95	257N	NUTS: A COOKERY BOOK FOR NUT LOVERS	9.95	133V	VNGA ANNUAL REPORT 1982	9.60
205D	DRIED FRUIT	3.95	210O	OGA RESOURCE BOOK	1.55 \$	139V	VNGA TECHNICAL REPORT NO 1	11.80
141D	DRYING AND PROCESSING TREE FRUIT	1.00	206O	ONE-STRAW REVOLUTION	16.95	250W	WALNUT REPORT	11.00 C
236E	EDIBLE & USEFUL WILD PLANTS OF THE US &	7.50	224O	ORGANIC GARDENING	12.95	145W	WESTERN FRUITS BERRIES & NUTS	9.95
147E	EDIBLE NUTS OF THE WORLD	24.95	149P	PALMS OF THE WORLD	29.40	151W	WHAT TREE IS THAT?	24.95
105E	ENCYCLOPEDIA OF FRUITS VEGETABLES NUTS &	7.95	135P	PAPAYA MELON OF HEALTH	3.95 O	157W	WILD FOOD IN AUSTRALIA	5.95
171F	FOOD CROPS OF PAPUA NEW GUINEA	5.00	190P	PERFECT COOKING WITH EXOTIC FRUITS VEGET	1.50	163W	WILD FRUITS & NUTS	4.95
177F	FOOD PLANTS OF THE SOUTH PACIFIC	4.00	161P	PERMACULTURE ONE	12.00	169W	WILD MEDICINE IN AUSTRALIA	5.95
221F	FOREST FARMING	18.95	167P	PERMACULTURE TWO	12.00	175W	WILDFLOWERS OF TROPICAL AUSTRALIA	6.00
231F	FRUIT & NUT BOOK	19.95	179P	PESTS PREDATORS AND PESTICIDES	4.95	219W	WINES WINEMAKERS & VIGNERONS OF THE SOUT	6.95 O
207F	FRUIT FARE	7.50	252P	PINON PINE	15.00 C			
239F	FRUIT FOR THE HOME & GARDEN	9.95	234P	PLANTS AND BEEKEEPING	7.95 O	REF	TITLE	PRICE *
183F	FRUIT GARDENING IN NEW ZEALAND	5.95	185P	PLANTS FOR DRY CLIMATES	9.95			
			217P	POISONOUS PLANTS	14.95			
			114P	POTENTIAL FOR LIQUID FUELS FROM AGRICULT	5.00			

* NOTE: O=Out of Print, available only while stocks last.
 C=Coming Title, price and arrival date tentative.
 \$=Special price, applies only to current stock.