



COASTAL FRUITGROWERS' NEWSLETTER

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NSW Agriculture

Fruitgrowers' Newsletter
Edited by Sandra Hardy
Design & Layout - Cathryn
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Dear Growers,

Welcome to another edition of the Fruitgrowers' Newsletter. During the winter months there's been a number of industry conferences and workshops.

The Deciduous fruit industry got together at the SnackFruit 2002 conference in Brisbane. The Australian Fresh Stone Fruit Growers Association had their AGM and now have a new name Summerfruit Australia - see page 12 for the latest industry news. A brief summary of some of the conference presentations are included in this newsletter (page 20). A full copy of the proceedings is published in the September issue of Good Fruit and Vegetable magazine.

The citrus nursery industry got together at their first National Citrus Nursery Workshop (see page 8) and the presentation on citrus rootstocks is reprinted in this edition (page 14).

A very successful Citrus Pruning Workshop was held for citrus growers on the Central Coast in late August. The workshop was run by Andy Krajewski who enthusiastically demonstrated all aspects of pruning citrus trees. A report from the workshop starts on page 24.

Happy reading and good luck with your spring orchard activities.

Sandra Hardy

The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser. Inclusion of an advertisement or sponsor's symbol in this publication does not necessarily imply endorsement of the product or sponsor by NSW Agriculture.

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Appearance	:	Clear to amber coloured liquid	
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Don't Lump It Pump It

Incitec
EASY Cal

A Closer Look at Citrus Scab

Nerida Donovan, Sandra Hardy and Fadi Saleh
NSW Agriculture.

Infection by citrus scab

The pathogenic fungus *Sphecoloma fawcettii* var. *scabiosa* causes citrus scab on lemons in Australia. Lemon fruits are susceptible to infection by the scab fungus until they are 3-4 cm in diameter (up until approximately 3 months after petal fall). Lemon foliage is susceptible to infection when the new growth flush is less than 25% expanded. For germination and infection to occur the scab spores need a wetting period from rain, overhead irrigation or spraying of at least 4 hours continuously or 1-2 hours followed by 3-4 hours within the next 24 hours. Brief wetting of foliage by non-fungicidal spray treatments has also been found to promote infection (Whiteside 1975). Temperature does not appear to have a major impact on the disease.

The severity of infection by citrus scab depends on the amount and frequency of wetting periods whilst the growth flush and fruit rind are susceptible to attack (Whiteside 1975). The extended bloom period in lemons makes accurate timing of sprays difficult.

Spread of citrus scab in the orchard

Fungal spores are produced directly on scab pustules on leaves and fruit and are dispersed within an orchard by rain, overhead sprinkler irrigation and during spraying operations (Whiteside 1975). Dew may also cause liberation of conidia from the pustules but, due to the limited splashing action, there would only be localised dispersal (Whiteside 1975). Some dry spores can also be spread by winds in excess of 2 m/s (Whiteside 1975, 1980).

Background to trial site

The trial site used in the study is a lemon variety / rootstock trial planted at Kulnura on the central coast of NSW. This site is one of 3 trial sites across Australia as part of HRDC project CT7005, funded by Australian Citrus Growers through a research levy managed and administered by Horticulture Australia. The trial site at Kulnura was planted in February 1997.

The lemon planting comprises 132 trees, made up of 5 replicated rows and 1 buffer row, with 6 m between rows and 3 m between trees in the row. Each row comprises 18 trees plus 6 buffer trees (24 trees per row). There are no other lemon trees planted near the trial block. The varieties planted include Fino, Verna, Taylor Eureka and Yen Ben on a number of rootstocks including Benton citrange, Cox (3798), Fraser, Volkameniana, Cleopatra mandarin x *Poncirus trifoliata* (639), Minneola x *P. trifoliata* and Zhenchen.

Potential infection periods for scab and melanose

A weather station was installed in the lemon trial to measure rainfall, temperature and leaf wetness at 2 positions on the tree. The aim of the study was to see if we could detect potential infection periods for citrus scab (as indicated by leaf wetness) that coincide with susceptible fruit and foliage being on the tree.

Figures 1 and 2 highlight the months during each year that had a significant number of days with sufficient leaf wetness for scab infections to occur. The danger periods were late winter to early spring and during late summer. The main (winter) lemon crop would have been most susceptible in the October period around flowering and possibly in February if flowering was in late October. The more valuable spring and summer crops developing from flowers in the December to April period would have been susceptible from December to July / August. Hence these periods may be critical for monitoring weather conditions and making spray decisions. Data collection from the trial site is continuing to confirm the results.

Spray trial for scab and melanose

Spray treatments for citrus scab and melanose were applied to the lemon trial in spring 2000, at ½ petal fall and repeated six weeks later. The spray trial involved 5 treatments across the 5 replicated rows (1 treatment per row):

- control – no spray applied
- Kocide
- Benlate + Kocide
- Score®
- strobilurin fungicide (BAS500)

In June 2001 the fruit was harvested and assessed for scab and melanose infection using a rating scale of 1-5 (1 = no infection, 5 = severe infection, > 80% fruit surface covered in disease lesions). Fruit weight and number per tree were also recorded. Scab and melanose infection throughout the block was limited, therefore no significant differences could be detected between the treatments.

References


- Whiteside J.O. (1975) Biological characteristics of *Elsinoe fawcettii* pertaining to the epidemiology of sour orange scab. *Phytopathology* 65: 1170-1177
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Figure 1: Rainfall data and number of days per month where leaf wetness was favourable to infection by the scab fungus between Aug-00 & July-01

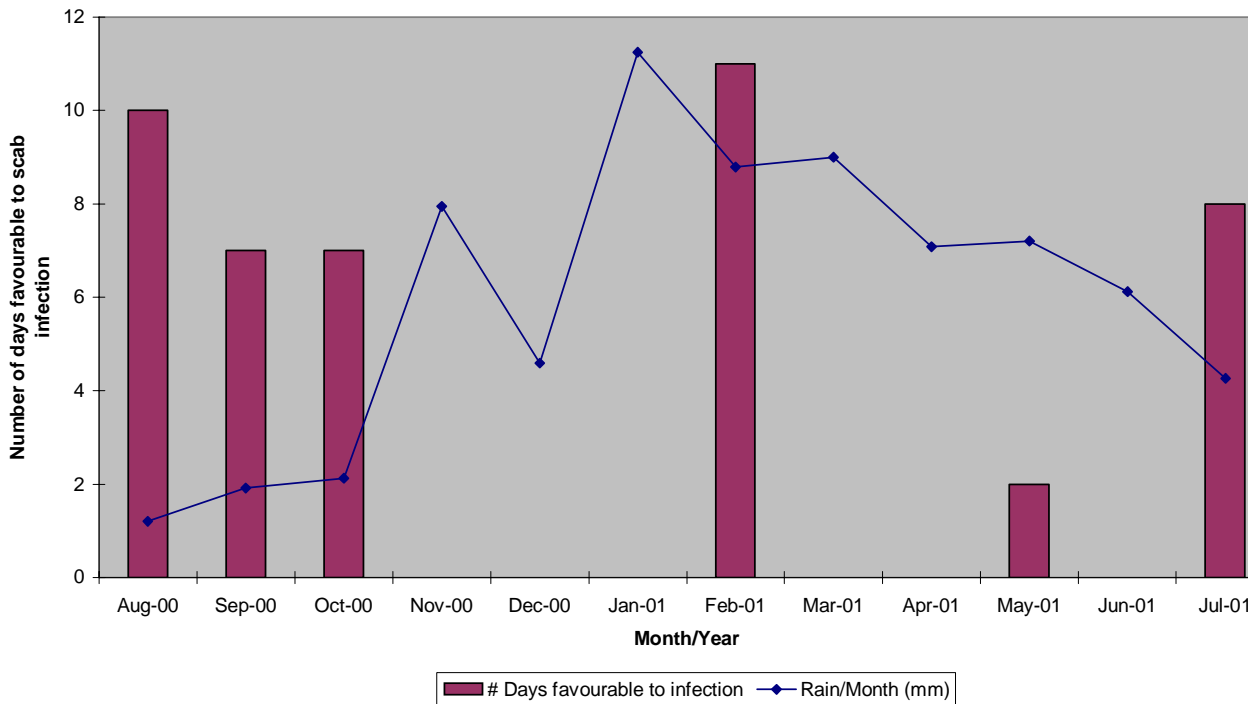
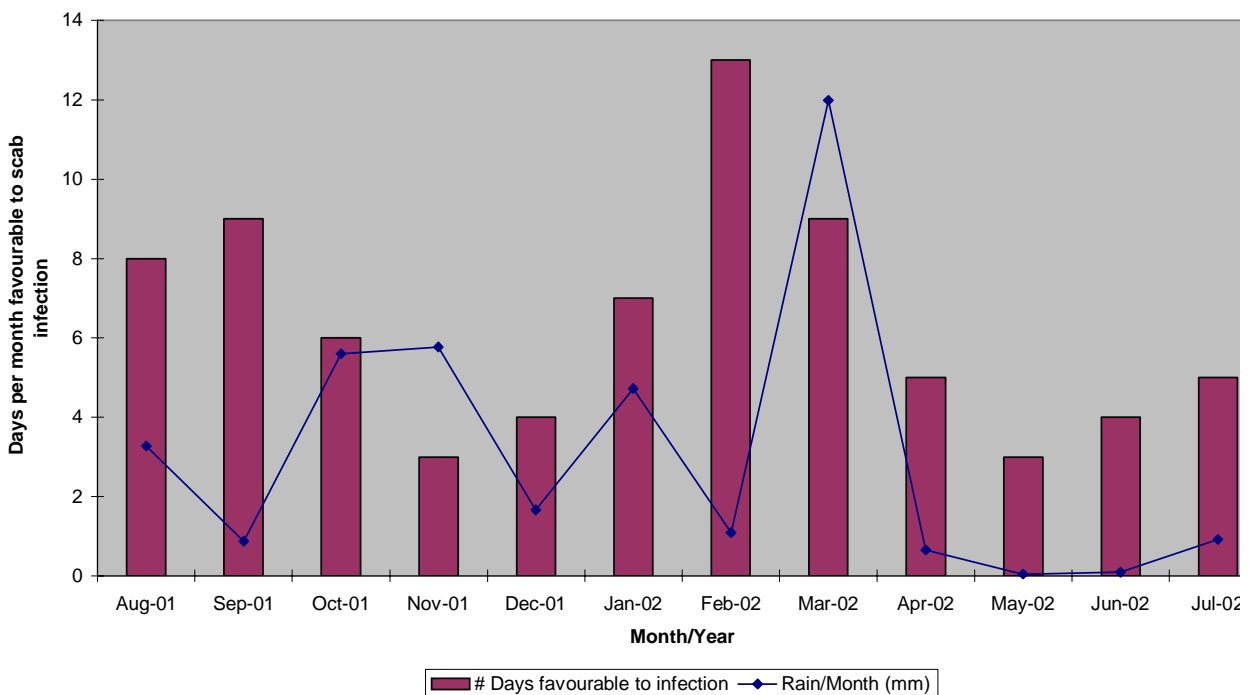


Figure 2: Rainfall data and number of days per month where leaf wetness was favourable to infection by the scab fungus between Aug-0 and July 02



Evaluation of New Citrus Varieties

Dareton Observations 2002

*Graeme Sanderson, Research Horticulturist, NSW
Agriculture and Paul Florissen, Auscitrus Horticulturist*

Evaluation of new citrus varieties is a major part of the 'Australian Citrus Improvement Program' project (CT01012) funded by Horticulture Australia. Since 1986 more than sixty new citrus varieties have been imported through the program and there has been continued grower interest in evaluation of new citrus varieties. The following article summarises initial assessment and field observations for a range of new citrus varieties at Dareton and also updates trial information on Daisy and Nova mandarins and Okitsu and Miho wase satsumas for the 2002 season.

Afourer mandarin

Afourer trees appear to be highly productive, with reworked Valencia orange trees bearing fruit two years after budding at Dareton. Long term yield performance of Afourer in Australia is still to be determined. Afourer fruit have a highly attractive external appearance and fruit have a flattened shape with fine, smooth skin texture. Compared to Murcott, Afourer is relatively easy to peel. Reworked trees at Dareton produced medium to large sized fruit this season. Fruit were at peak maturity in late July at Dareton this year. Trees are upright, vigorous, highly productive and require thinning but do not appear to overcrop to the same extent as Murcott. The two-year old reworked trees required thinning to prevent limb breakage. Afourer fruit mature before Murcott and reached a brix:acid ratio of 10:1 in mid-June at Dareton in 2002.

Exclusion of insect pollinators from whole limbs during flowering led to reduced fruit set and significantly smaller fruit size. Although preliminary observations indicate that fruit were seedless, they may not achieve marketable fruit size. Trees that were cross-pollinated during flowering appear to be more productive with large seedy fruit (average of ten seeds per fruit). Afourer mandarin is currently available from Auscitrus (\$2.75 per bud inc. GST), with demand for budwood expected to increase over the next few years.

Corsica 1 and Corsica 2 clementines

Both clementine varieties commenced cropping in 2002 at Dareton, two years after Valencia trees were reworked by budding. Topworked trees had heavy crops with medium fruit size. Trees of both varieties required thinning of fruitlets to prevent overcropping. Experience in New Zealand also indicates that trees bear heavy crops. Corsica 1 matures at least two weeks earlier than Corsica 2. Optimum maturity for Corsica 1 at Dareton was from mid-April to mid-May in 2002. Optimum

maturity for Corsica 2 at Dareton was from early to late May in 2002. Corsica 1 and Corsica 2 clementines both developed an attractive orange rind colour and rind texture was smoother than other early maturing clementine varieties such as Marisol, which tend to have rough skin texture. Internal quality and flavour of both Corsica 1 and Corsica 2 clementines was similar to de Nules clementine, with brix:acid ratios slightly lower. Corsica 1 appears to be very early maturing with a typical brix:acid ratio of 9:1 in mid-April at Dareton, although the rind had not reached full colour. Corsica 1 and Corsica 2 clementines are available from Auscitrus at \$2.75 per bud (inc. GST).

Caffin clementine

First fruit of Caffin clementine were observed on potted glasshouse trees at Dareton in late April. Fruit had intense deep orange rind colour and thin finely textured rind. Fruit had a high sugar content with a Brix:acid ratio of 12.5:1 and high juice content in late April. Caffin has some potential as an early maturing clementine but growers should note that these are preliminary observations. Grafted field trees are expected to commence cropping in 2003. Caffin clementine will be available from Auscitrus from spring 2002 at \$2.75 per bud (inc. GST).

Fukumoto navel

There has been increased interest in Fukumoto navel during the recent budwood season based on Californian experience, with demand for Fukumoto buds from Auscitrus increasing from less than 1500 buds in 1999/2000 to 14,000 in 2001/2002. Fukumoto navel commenced cropping in 2002 at Dareton on reworked Valencia trees and two-year-old field trees. Preliminary observations for Fukumoto were made in May/June 2002. Fukumoto navel was later maturing than Navelina 7.5, with Navelina 7.5 fruit starting to colour in late April but Fukumoto still fully green or showing slight colour change. Internal maturity tests at Dareton in mid-July indicated that Fukumoto maturity was no earlier than Washington navel in 2002. Observations in Queensland also indicate that Fukumoto navel matures at a similar time to Washington navel. Rind colour of Fukumoto navel fruit at Dareton was yellow/orange at optimum maturity. The development of intense orange rind colour reported in California did not occur this year at Dareton. Fukumoto produced medium sized, round fruit with a small, concealed navel. Incidence of albedo breakdown was similar to Washington navel in 2002. Fukumoto navel also has a high incidence of segmental chimeras in California, and incidence of chimeras will be assessed at Dareton in 2003 when larger volumes of



fruit are produced. A disorder known as 'foamy bark rot' has been observed in Fukumoto navel trees in California but the exact cause has not been identified. Fukumoto navel is available from Auscitrus at \$2.75 per bud (inc. GST).

Avana Apireno & Avana Tardivo di Ciaculli mandarins

Both varieties were reworked onto Valencia trees at Dareton in 2000 and are expected to commence cropping in 2003. First fruit were observed on potted trees at Dareton in 2002. Trees of both Avana selections have a similar appearance to Imperial mandarin. Avana Apireno is earlier maturing than Avana Tardivo, and both selections produced fruit with similar fruit size and external appearance to Imperial mandarin. Avana Apireno also has highly perfumed rind, similar to Imperial. Growers should note that these are preliminary observations and more detailed information will be obtained at Dareton in 2003 when grafted field trees commence cropping. Avana Apireno and Avana Tardivo di Ciaculli are both available from Auscitrus at \$2.75 per bud (inc. GST).

Daisy mandarin

Reworked trees at Dareton had medium/large fruit size and deep orange/red rind colour in 2002. Daisy fruit appears to colour well in a range of environments, including sub-tropical Queensland. Fruit maturity at Dareton this year was two weeks later than in 2001. Reworked trees at Dareton produced their third commercial crop this year, with trees on citrange showing signs of severe alternate bearing, but trees on Cleopatra and *Poncirus trifoliata* showing good productivity. New foliage is particularly susceptible to spray damage. Observations in the Central Burnett growing region indicate that Daisy is susceptible to *Alternaria* brown spot in sub-tropical growing conditions. It may be possible to snap-pick Daisy fruit rather than clipping from the tree. Daisy can be held on the tree for up to six weeks whilst retaining fruit acidity and good rind condition. Daisy does have some susceptibility to albedo breakdown. Incidence of albedo breakdown in Daisy was reduced at Dareton by late January application of Gibberellic acid in 2002. Application of Gibberellic acid did not effect final rind colour. Daisy mandarin is available from Auscitrus at \$1.10 per bud (inc. GST).

Nova mandarin

Nova has shown consistent bearing on reworked trees at Dareton. The budline used for reworking was the Spanish budline, which is a thornless selection. Fruit are medium sized and highly coloured. Fruit are at optimum quality for 2-3 weeks before stem end dryness becomes a problem. Normal maturity at Dareton is early/mid June. Nova may also show reduced seediness if isolated from other pollen sources. Fruit splitting may reduce

crop load by up to 30%. Nova fruit displayed a high degree of fruit splitting this season. Fruit splitting is a common characteristic of Nova mandarin and incidence of splitting does not appear to be related to a single growth stage, but occurs over an extended period after fruit set. Nova mandarin is available from Auscitrus at \$1.10 per bud (inc. GST).

Okitsu Wase and Miho Wase satsumas

Trial work at Dareton this season focussed on the use of mild water stress to manipulate fruit quality. This technique is used widely in Japan to improve satsuma fruit quality. EnviroScan soil moisture sensors and tensiometers were used to regulate irrigation, with the aim of increasing the sugar and acid content of both satsuma varieties. Results from this season indicate that it is possible to achieve a °Brix content of greater than 10° on citrange rootstock (9.6°Brix was the highest achieved in 2001) and acid content of greater than 1%. Increases in fruit quality from water stress were offset by smaller fruit size. Fruit subjected to the most extreme level of water stress reached 13.5 °Brix, but fruit size was significantly reduced and was unmarketable. Test marketing of fruit on the Melbourne market against a flood of Imperial mandarins in early May 2002 achieved prices no better than Imperial mandarin, even though fruit quality of the satsumas was better. Further test marketing of satsumas will be concentrated on direct supply to supermarket chains. Okitsu wase and Miho wase satsumas are available from Auscitrus at \$1.10 per bud (inc. GST).



PESTICIDE UPDATES

◆ Benlate Available

A new product containing benomyl (500g/kg) has been registered in Australia by Farmoz. The product called Marvel® is registered for use in the following tree and vine crops: citrus, grapes, apples, pears and stone fruit. For citrus it is registered for the control of Black Spot in QLD, NSW and the NT. For more information contact Farmoz or your local chemical retailer.

◆ Carpophilus beetle control in Stonefruit

CropCare has submitted the registration application for the use of Talstar® to control carpophilus beetles in stone fruit to the National Registration Authority (NRA). **It is anticipated that registration is likely by the end of October 2002, in preparation for the coming season.** For more information contact CropCare or the NRA.

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News in Brief



Paul Florissen, Auscitrus Horticulturist

◆ New Citrus Varieties Available


Two new citrus varieties are available for supply by Auscitrus in spring 2002. The varieties are Caffin clementine, imported from New Zealand and Bergamot (Castagnaro), imported from Corsica. Caffin is an early maturing clementine selection that is produced commercially in New Zealand. Bergamot is a niche market fruit used to produce essence of bergamot from rind oil for use in perfumes and pharmaceuticals. Budwood of both varieties is available from Auscitrus in limited quantities at \$2.75 per bud including GST. Contact the Auscitrus secretary for order forms (02) 4325 0247

◆ Citrus Variety Fact Sheets

All Citrus Variety Fact Sheets are currently being updated with the latest trial information from around

Australia. Updates for navel orange variety fact sheets have now been completed and can be viewed and downloaded at the Australian Citrus Growers website: www.auscitrus.org.au/varieties. Lemon, grapefruit and mandarin factsheets will be updated by December 2002.

◆ National Citrus Nursery Workshop Proceedings

Following the excellent response to the National Citrus Nursery Workshop held at Dareton in June, Auscitrus is considering offering the workshop proceedings and speaker presentations for sale if there is sufficient interest from nurseries and growers. The proceedings and speaker presentations cover the latest information on new varieties, rootstocks, viruses, dwarfing, hygiene, pest control, irrigation and fertigation and accreditation for citrus nurseries. The proceedings would be made available as a printed book and speaker Powerpoint presentations would be available on CD. Please contact the Auscitrus secretary for expressions of interest (02) 4325 0247. 



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News in Brief



Extracted from :

LOW CHILL STONE FRUIT GROWER

No 1/02 - August 2002

◆ **Flying Fox Developments**

The NSW Flying Fox Consultative Committee has been denied funding by the NSW Government for a number of projects, including non-lethal means of deterring predation.

The NSW Farmers' Association, which was instrumental in having the Committee established, is seeking to have the decision over turned. However, there are ominous signs that the EPA has washed its hands of the consultative process and is adopting a "net or else" approach. The inevitable consequence of this is an end to the facility of shooting under licence when the three-year review term expires next year.

The Consultative Committee was established to use the three-year period of grace to find a long-term strategy for flying fox management, but it seems that it has been effectively neutralized by the same Government that established it.


This is another example of farmers being forced to carry alone the full cost of achieving an environmental outcome said to be of benefit to the whole community. There is little wonder that there is such a determined campaign now by NSW Farmers' Association to keep the issue of property rights on the political agenda. Diminishment of our property rights for public good reasons must be compensated from the public purse.

◆ **Farmers' Market Opportunity**


The dysfunction and oversupply of the domestic fresh produce market has exposed the need to develop alternative market outlets. To this end the NSW Farmers' Association has proposed a network of "true" and properly organised farmers' markets around NSW.

To test support for such markets, the Association is to conduct a "pilot" farmers' market at the Warwick Farm Racecourse commencing on Saturday 5 October. The Association will be extensively promoting/advertising the market to attract consumers from the western areas of Sydney. If successful, the intention is to proliferate such markets throughout the State and Coffs Harbour is one of the locations identified as a priority prospective site.

To use the market, suppliers must be members of the Association, only sell produce (or value-added products) that they have grown, raised or produced themselves;

and hold both product and public liability insurance at a minimum for each of \$10 million. The cost of a stall per day is \$200 (\$150 if you provide your own tables and shade and don't require on-site power). **More information on the market may be obtained from Madeleine Seppelt on 02 8251 1857.** 

◆ **EMS Incentive Program announced in Federal Budget**


The launch of the 2002-2003 Federal budget on 14 May included mention of \$25 million over 5 years for an Environmental Management System Incentive Program (EMSIP) to encourage voluntary adoption of EMS by primary producers. This program will begin on 1 July 2002 at which time the guidelines will also be available. However, if you would like more background on the program, please contact the EMSIP Manager, Mark Cleghorn on tel 02 6272 4546, email: mark.cleghorn@affa.gov.au. 

◆ **Two New Coastal NSW Cittgroups Proposed**

During August two meetings were held with Nathalie Jarosz, (Communications Manager with Australian Citrus Growers) and citrus growers on the Central Coast, at Central Mangrove and the far North Coast, at Alstonville. The meetings were organised by Sandra Hardy in order to incorporate coastal NSW citrus growers into the National Cittgroup program, thereby accessing industry levy funds to undertake further extension activities.

The meetings focused on the value of Cittgroups, their function, operation, funding, and reporting requirements. The National Cittgroup Program has been in operation since the early 1990's and currently incorporates all the major citrus growing regions in Australia.

At the local level Cittgroup activities are organised by a Cittgroup coordinator and managed by a local grower based management committee. The proposed operation of the Central Coast Cittgroup will initially focus on reforming the local citrus growers into a revitalised group. The North Coast Cittgroup based on the North Coast Citrus Growers Association will initially focus on increasing grower awareness and knowledge of local and overseas research and development and marketing.

Following the meetings Nathalie Jarosz put together the formal Cittgroup proposal, which was submitted in September 2002 to Gerard McEvelly, Citrus Program Manager with Horticulture Australia for discussion with the Citrus ICA. If successful funding for the two new Cittgroups will begin in January 2003. 

News in Brief

◆ National Citrus Planting's Database and Crop Forecasting Project

The Citrus Industry in conjunction with Horticulture Australia has agreed to fund a new Project the "National Planting's Database and Crop Forecasting Project" starting in October 2002.

Background:

The Murray Valley Citrus Marketing Board adopted the SunLIS methodology as a pilot program funded by the Horticultural Research and Development Corporation in 2000. Adoption of the system across all major citrus

growing regions has been identified by the citrus industry as a priority. SunLIS use Geographic Information System (GIS) software and orthophoto imagery to accurately map citrus plantings and store detailed data on varieties, rootstocks, year planted, inter-plantings, reworking, tree numbers etc.

Information can be produced to benefit citrus growers at the individual property level or aggregated to produce district or regional outputs. Aggregated regional outputs will be generated for incorporation into a National Australian Citrus Growers (ACG) system.

Project Details:

All the major citrus growing regions are to be included in the project, the Riverland (SA), Riverina, Coastal NSW, Bourke, Narromine, QLD, WA and the NT.

The project will be undertaken by SunRise 21 in conjunction with the Australian Citrus Growers and State Departments of Agriculture. The minimum information required for the National Planting's Database includes crop area, tree numbers, variety and year planted.

Citrus properties will first be identified using orthophoto imagery. Following this the detailed crop information will be collected via farm visits and surveys of citrus growers and entered into a national database. Individual property information will be confidential and remain the property of the individual growers. Only aggregated information will be used by the ACG to predict production statistics and future crop production and trends.

The coastal NSW citrus industry statistics will focus on the Central Coast and North Coast citrus growing regions. It is anticipated that data collection will start early in 2003. Sandra Hardy NSW Agriculture's District Horticulturist at Gosford will coordinate the collection of data for coastal NSW.



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LEADING IN AGRIBUSINESS



News in Brief

◆ Chemical Review Update

Kevin Bodnaruk


LOCAL:

Fenthion. The NRA has decided to delay the review of fenthion till it is in a position to also review dimethoate, and do both products together.

INTERNATIONAL : EUROPE

- The European Commission has recently announced that it is planning to withdraw some 320 chemicals from the market in July 2003. Most of the products to be withdrawn will be as a result of manufacturers declining to defend their products for economic reasons following notification procedures set up by the Commission in 2000-2001.
- European regulators have also indicated that they intend lowering most MRLs for dimethoate from 1.0 mg/kg to the limit of detection (LOD) within the next few months. Commodities affected include citrus, stonefruit (except cherries), pomefruit, berries and small fruit, tropical tree fruit, root and tuber vegetables, leafy vegetables, fruiting vegetables, legume vegetables and some brassica vegetables.

USA


- The US EPA is proposing to revoke all the MRLs for benomyl as it is no longer registered for use in the United States. Unlike Australia an alternative manufacturer has not emerged. The US EPA is currently going through a consultation period while it determines whether any individuals or groups want any of the MRLs kept. Clarification is being sought regarding the status of MRLs for related compounds from the US. Comment is also being sought from horticultural industries regarding the importance of benomyl use in any crops that export to the US. The proposed time frames for the revocations varies for different commodities, e.g., Brassica vegetables - 1/1/2006; beans, carrots & celery - 1/1/2007; avocado, mango, grapes, citrus, strawberry, stonefruit & pomefruit 1/1/2008 and capsicums and tomatoes 1/1/2009. 

◆ Horticulture business guide launched

Agriculture Minister Richard Amery has launched a guide to help horticulture growers improve the marketing of their produce. The launch of "Marketing For Success - a growers guide" took place at the Sydney Markets in conjunction with a pilot workshop for a new training course, "Doing Business Better."

The guide has been compiled by the NSW Horticulture Market Chain Committee which was established to improve communication and other issues relating to the marketing of fruit and vegetables. The committee comprises representatives of growers, major retailers and Government.

The guide is part of a series of reference materials being developed by the NSW Horticultural Market Chain Committee. The Marketing for Success brochure is available on NSW Agriculture's website at www.nsw.gov.au/reader/hmcc.

The committee also indentified the need for a training course to help growers develop better business management skills. The course covers topics such as how to negotiate a supply contract, identifying how retailers do business, developing market groups and looking at new developments such as e-commerce. Further information about the guide, training courses and committee activities is available from Delia Dray NSW Agriculture, Orange on 02 6391 3162. 

◆ Permethrin: Citrus use pattern confusing label wording


Roger Tofflon (*Program Leader Chemical Risk Management*)

Residues of permethrin have recently been detected in some citrus samples tested as part of Quality Assurance schemes. As there is no MRL for permethrin in citrus any residues are violative.

The residues may have occurred because of confusion arising from the current wording on the label. In the Crop column of the Directions for Use table, the citrus claim is worded 'Citrus spp', which implies that all citrus may be treated. However, the context of the wording in the Critical Comments section implies that the use pattern is intended only for nursery plants. It is not very clear that application to citrus other than nursery plants is excluded.

The products in question are:

- Ambush Emulsifiable Concentrate Insecticide
- Farmoz Hellfire 500 EC Insecticide
- Farmoz Permethrin 500 EC Insecticide
- Stakeout Emulsifiable Concentrate Insecticide
- Zeeper 500 EC Insecticide

At this stage we recommend that products containing permethrin should only be used on nursery plants and not on bearing orchard trees. The NRA has been contacted and suggestions have been made to change the wording on the label to 'Citrus non-bearing trees only'. 



Summerfruit Australia Inc.

“Developing our Industry”

◆ **We have a new name!**

Summerfruit Australia Inc (formerly the “Australian Fresh Stone Fruit Growers’ Association Inc”) is a Federated structure representing the interests of the six State Stone Fruit Growers Associations, and their individual growers members. The reasoning behind the name change is that the term “stone fruit” has negative connotations for consumers. It is felt that “Summerfruit” as a modern term, is more in keeping with the Association’s fresh new direction.

◆ **Fresh Team for Summerfruit Industry.**

At the recent 8th Annual General Meeting of Summerfruit Australia Inc held in Brisbane, the new leadership team for 2002/2003 was appointed:

Pat Wibaux – Independent Chairman

Ray Pool – First Deputy Chairman (VIC delegate)

Eric Altinier – Second Deputy Chairman (WA delegate)

David Rowland – Honorary Treasurer (NSW delegate)

Mark Miller – (Tas delegate)

Kaye Neale – (SA delegate)

Neil Mungall – (QLD delegate) Incoming Independent Chairman Pat Wibaux, a stone fruit producer from the QLD Sunshine Coast, said

“My first priority as Independent Chairman is to meet with industry leaders in the regions across Australia to identify any outstanding impediments to achieving a full regional participation in State Industry structures, and thereby a united Summerfruit Industry. Obviously, unless everyone is rowing in the same direction, we simply cannot achieve our goals, and many valuable opportunities will be lost.”

◆ **Summerfruit Industry Strategic Plan**

The new Summerfruit Industry Strategic Investment Plan was also adopted at the Brisbane meeting. The plan was prepared by consultant Graham Johns from Horticultural Development Services Pty Ltd, following extensive consultation with Summerfruit producers across Australia, that identified:

- Growers want to sell more fruit and they believe promotion and advertising will do this for them.
- Growers want to know how their levy dollars are being spent.
- Growers do not want to get caught planting the wrong varieties

- Growers are worried about key pests and/or diseases in their state.
- Growers want to see a reduction in the amount of “out of class fruit “ on the market throughout the season.

The new Summerfruit Industry Strategic Investment Plan also establishes a fresh direction for the Australian Summerfruit industry by identifying the key strategic requirements for the industry to achieve its full potential:

- Overcoming industry division and unrest.
- Addressing human resourcing needs.
- Improved industry communication.
- Achieving consistent fruit quality
- Improving on farm profitability.
- Adequately funding industry development.

The Executive Committee of Summerfruit Australia is now proceeding to implement the new plan through the following key strategies:

- A significant reallocation of marketing levy funds from supply chain programs and product out-turn monitoring, to direct promotion and advertising, including a limited television campaign during the coming Summer months.
- The appointment of a full time Industry Development communication plan aimed at improving the information flow to and from Summerfruit growers, and ensuring Summerfruit growers are regularly consulted and encouraged to become more involved in decision making on the expenditure of their levy funds.
- Completion of a register of Summerfruit levy payers to enable growers to have a vote on major policy issues, including all levy matters.
- Approval of levy payers to change the mix of Marketing & R&D levies from the current 60:40 to 45:55 thereby optimising program funding to enable the new strategic plan to be fully implemented.
- Reviewing the current structure and decision making processes of Summerfruit Australia to identify what changes need to be made to strengthen the participation and representation of growers in all production regions.

As part of an ongoing organisational restructure, Association executive officer Peter McFarlane will also be stepping down from this position when the IDM is appointed. Mr McFarlane has held the EO position on a part time basis for the past 7 years, during which time he has been a staunch advocate for the implementation of a network of Industry Development Officers in the production regions, and has worked tirelessly to bring about the appointment of a full time IDM position.

Monitoring pesticide and cadmium residues in fresh fruit and vegetables 2000-2001

Sandra Hardy, NSW Agriculture, Gosford.

NSW Agriculture and Sydney Markets Limited (SML) continue to fund the Pesticide Residue Survey which was started in 1989. Between 1989 and 2000, more than 97% of all samples met the MRL standard. Following is a brief summary of the results from the Pesticide and Cadmium Residues Monitoring Program in horticultural commodities distributed through the Sydney Markets from November 2000 to June 2001.

Some 336 samples, comprising 44 different fresh fruit and vegetables, were purchased from Sydney Markets between November 2000 and June 2001. The samples were analysed for residues of 26 pesticides with some

samples also tested for the heavy metal, cadmium.

Pesticide residues were either absent or complied with the Maximum Residue Limit (MRL) in 97.6% of samples. Only eight samples (2.4%) contained pesticide residues which exceeded the MRL, with another seven samples with residues between 50% and 100% MRL. Of the 37 samples analysed for the heavy metal cadmium, none were above the Maximum Permitted Concentration (MPC) for cadmium.

A copy of the full report can be obtained from Sandra Hardy at Gosford.



	Fruit	Vegetables	Total + % of total
Number of samples	155	181	336
Number of Samples with no detections	133	135	268 (79.8%)
Number of Samples with detections	22	46	68 (20.2%)
Number of Chemical Residues detected	37	41	78
Number of residues > Limit of Detection to 50% of MRL	33	30	63
Number of residues >50% MRL to the MRL	3	4	7
Number of samples over MRL	1	7	8 (2.4%)

CONTROL OF WESTERN FLOWER THRIP (WFT) IN STONEFRUIT (PERMIT NUMBER - PER5531)

OFF-LABEL PERMIT FOR USE OF A REGISTERED AGVET CHEMICAL PRODUCT

THIS PERMIT IS IN FORCE 8 JULY 2002 to 30 JUNE 2003 .

This permit application is for an extension of use to permit 4844, to use in the Sydney Basin, NSW. It has been supported by NSW EPA and NSW Agriculture as a genuine need. Stonefruit growers have experienced considerable economic losses due to Western Flower Thrip (WFT). There is significant resistance in populations of WFT to organophosphate, carbamate and various pyrethroids. For resistance management purposes it is important to alternate the use of products from different chemical groups.

DETAILS OF PERMIT

1. Persons : Persons generally.

2. Products : SUCCESS NATURALYTE INSECT CONTROL Containing: SPINOSAD as its only active constituent.

3. Directions for Use: Crop Pest Rate STONE FRUIT: WESTERN FLOWER THRIPS 80mL/100L water.

Critical Use Comments: Apply 3 consecutive sprays only, at 6-12 day intervals if temperature is less than 20C or 3-5 day intervals if temperature is greater than 20C.

Withholding Period: Do not harvest for 14 days after application.

4. States: NSW and QLD

(Note: Victoria is not included in this permit because their 'control-of-use' legislation means that a permit is not required to legalise this off-label use in VIC).

Fate of produce from treated plants: Produce from plants treated can only be supplied to or otherwise made available for human or animal consumption if the resulting residues are at or below the established maximum residue limit (MRL) of T0.2 mg/kg.

Export of Produce: Exported produce or animals must have appropriate residue tolerance limits established in the importing countries and any residues must not exceed the tolerance limits.



Know Your Citrus Rootstocks

Ken Bevington, NSW Agriculture, Dareton

Introduction

Citrus rootstocks vary in their adaptability to different soil types, tolerance of adverse soil conditions and in their effects on yield, fruit size and quality. They also vary in their tolerance to soil pests and diseases and in their suitability for use on replant sites. Because of large effects on tree vigour and fruit characteristics, rootstocks differ widely in their suitability for different varieties and planting systems. Almost all important horticultural characteristics of citrus varieties are influenced to some degree by choice of rootstock. Choosing the right rootstock is therefore a critical factor in determining the long-term success of any citrus planting.

Problems of graft incompatibility are well known in citrus and restrict the use of certain scion cultivars with some rootstocks. Scion incompatibilities tend to be highly specific in nature. Thus, although some orange or mandarin cultivars grow well on a particular rootstock, it does not follow that all orange and mandarin cultivars will perform satisfactorily on that rootstock. While compatibility problems with established cultivars are generally well known, new or untried scion and rootstock combinations should be treated with caution. Unfortunately, graft incompatibility is often not manifested until well after the trees come into full bearing.

Choosing a rootstock

No single rootstock is suitable for all sites or for all varieties. The most appropriate rootstock for a particular site will depend on site characteristics, intended planting system, the likelihood of specific pest, disease or salinity problems, the variety to be grown and planned market outlets and marketing strategies for the fruit. Because of site variability and planned marketing strategies, some of the more successful orchard developments utilise several different rootstocks to achieve the desired outcome. All rootstocks have some limitations. Understanding these limitations is an important step in choosing the right rootstock.

A positive development within the industry is the trend to obtaining comprehensive soil surveys and profile descriptions of proposed orchard sites prior to planting with a more objective assessment of profile characteristics. This development is to be encouraged and will not only assist with selecting the most appropriate rootstock for the site but will also contribute to the pool of knowledge on rootstock performance and adaptability to different soil situations.

Characteristics and limitations of common commercial rootstocks

Rootstock usage in Australia differs between the major producing areas reflecting differences in soils and growing conditions, and the principal varieties grown in each area. Under Australian conditions the main pest and disease considerations are citrus nematode, *Phytophthora* root and collar rots, and citrus tristeza virus (CTV). All rootstocks used in Australia must be tolerant to CTV, and for rootstocks to be used in replant situations, tolerant of *Phytophthora* and citrus nematode.

The main rootstocks currently used in Australia are *Poncirus trifoliata*, Troyer citrange, Carrizo citrange, Swingle citrumelo, Cleopatra mandarin, rough lemon, sweet orange and Benton citrange. These rootstocks accounted for 93 % of Auscitrus seed sales in 2001, with *P. trifoliata*, Troyer, Carrizo and Swingle making up the bulk of sales. General characteristics and major limitations of these rootstocks are summarised in Table 1. Effects on fruit quality and relative ranking for nematode, *Phytophthora*, CTV, salt and lime tolerance are shown in Tables 2 and 3 further highlighting rootstock differences. Ranking of rootstocks for specific attributes is based on data from research trials conducted under uniform conditions. Actual horticultural performance under commercial conditions will depend on management inputs.

***Poncirus trifoliata*.** *Trifoliata* is the preferred rootstock for heavy soils and the most widely planted rootstock in the MIA of New South Wales. Although reported to be drought sensitive, with attention to irrigation requirements and in the absence of salinity problems, trees can be long-lived and highly productive on lighter textured soils. Generally a good rootstock for oranges and satisfactory for grapefruit, most mandarins and lemons with the exception of Eureka selections. Because of reported incompatibility problems with some minor varieties, caution needed with untried scion combinations. Responsive to viroid dwarfing and recommended for viroid dwarfing of oranges. Suitable for replant sites.

Troyer and Carrizo citranges. More salt tolerant and better adapted to lighter textured soils than *P. trifoliata* these rootstocks are now the most widely used general purpose rootstocks for citrus in the Murray Valley. Also widely planted in Queensland. Under Australian conditions little distinction is made between the per-

formance of trees on these rootstocks and for all practical purposes may be considered identical.

On suitable soils and in the absence of excessive alkalinity, among the most productive rootstocks for most varieties in the southern inland growing areas, although the ability of older trees (>20 years) to sustain good fruit size is currently being questioned in some locations. Citranges are sweet orange x *P. trifoliata* hybrids and generally exhibit the same scion incompatibility problems as *P. trifoliata*. The decline of Imperial mandarins on citrange, which appears related to excessive rootstock overgrowth at the bud union, may be triggered by excessive cropping. Crop regulation should be considered an essential management requirement with mandarin cultivars grown on these rootstocks. Carrizo and Troyer are responsive to viroid dwarfing and these rootstocks are recommended for viroid dwarfing of oranges. Suitable for replant sites.

Swingle citrumelo. Swingle is attracting increasing attention as an alternative rootstock to Troyer and Carrizo for navel and valencia oranges and grapefruit. Reported to be an outstanding rootstock for grapefruit overseas and has shown good results with navel oranges in Australia. Experience with other varieties limited. Swingle is a grapefruit x *P. trifoliata* hybrid and in common with other *P. trifoliata* hybrids is incompatible with Eureka lemon. There are also reported incompatibility problems with some mid-season orange cultivars and mandarins. Most likely has similar soil preferences to Troyer and Carrizo but may be more salt tolerant. Intolerant of shallow, poorly drained sites and highly calcareous soils. Suitable for replant sites.

Cleopatra mandarin. Widely used in Queensland as a rootstock for mandarins and to a limited extent in the southern growing areas. Considered a good rootstock for most mandarins. Cleopatra is the most lime tolerant of currently recommended rootstocks and there is some

interest in using Cleopatra with other varieties in Sunraysia and the Riverland to overcome problems in soils with shallow lime horizons. Under good growing conditions the trees are extremely vigorous and attain a large size at maturity. Although shy bearing as young trees, productivity of mature trees is comparable to other rootstocks. No reported compatibility problems. Not generally recommended as a replant rootstock but may perform satisfactorily in specific locations, especially where the site is spelled prior to replanting and there are no drainage problems.

Rough lemon. Widely used in the past as a general purpose rootstock for citrus, especially in the Riverland of South Australia. There are various selections which all have similar characteristics. In general, trees on rough lemon rootstocks are vigorous, highly productive and show good drought tolerance on sandy soils. There is some current interest in using rough lemon for oranges on well-drained new sites to take advantage of early maturity and good fruit size produced on these rootstocks. Not recommended for replant situations because of susceptibility to *Phytophthora* root and collar rots.

Sweet orange. Widely planted in Sunraysia and the Riverland where many productive old plantings still exist. An excellent rootstock for citrus on well drained sites on new ground in the Murray Valley. No reported scion incompatibilities. Limited current interest because of susceptibility to *Phytophthora* root and collar rots. Not suitable for replant sites.

Benton citrange. Benton was selected as a *Phytophthora* resistant rootstock compatible with Eureka lemons from the NSW Agriculture rootstock breeding program. Benton has proven to be an excellent rootstock for Eureka lemons with no signs of incompatibility. Interestingly, Benton is also performing well with some orange cultivars in Florida. Experience with


Quality characteristic	Rootstock					
	<i>P. trifoliata</i>	Carrizo Troyer citranges	Swingle citrumelo	Cleopatra mandarin	Rough lemon	Sweet orange
Fruit size	medium-large	medium	medium-large	small-medium	large	medium
Rind thickness	thin	thin	thin	thin	thick	medium
Rind texture	smooth	smooth	smooth	medium	coarse	medium
Maturity	mid-late	mid	mid	mid	early	mid
Juice content	high	high	high	medium	low-medium	medium
TSS	high	high	high	medium	low	medium
Acidity	high	medium-high	medium	medium	low	medium

Table 2. Average effects of rootstocks on citrus fruit quality.

oranges and mandarins in Australia has been disappointing with variable results. Recommended for replant sites.

Other rootstocks.

Other rootstocks being requested through Auscitrus in small quantities for commercial citrus plantings are Cox mandarin hybrid, C35 citrange and Citrus volkameriana. Cox is a Scarlet mandarin x P. trifoliata hybrid bred by NSW Agriculture. It is resistant to Phytophthora root and collar rots and has shown promise in screening trials as a rootstock for Eureka lemons with no signs of the

bud union incompatibility. Cox has relatively seedy fruit and produces uniform, moderately vigorous seedlings in the nursery. C35 citrange is attracting interest as a possible rootstock for navel oranges and has shown good results with navels in California. C. volkameriana is being used as an alternative rootstock for lemons and has similar characteristics to rough lemon. 

Further reading

Forsyth, J. B., and Barkley, P. 1989. Citrus rootstocks. Agfact H2.2.2. NSW Agriculture.

Rootstock	Phytophthora	Tristeza	Citrus nematode	Salinity	Lime
P. trifoliata	1	1	1	5	5
Carrizo citrange	2	1	3	3	4
Troyer citrange	2	1	3	3	4
Swingle citrumelo	2	1	1	2	4
Benton citrange	2	1	?	4	4
Cleopatra mandarin	3	1	4	1	1
Rough lemon	4	2	4	4	3
Sweet orange	5	2	4	3	2

Table 3. Relative tolerance of citrus rootstocks to diseases, citrus nematode, salinity and lime.
1 = best of rootstocks listed; 5 = worst of rootstocks listed

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Table 1. Summary of major citrus rootstocks used in Australia and their advantages and disadvantages

Stock	Characteristics	Requirements	Major risk factors
Poncirus trifoliata	Highly resistant to Phytophthora, tristeza and citrus nematode. Cold hardy. Intolerant of exocortis. Shallow depth of rooting but develops high fibrous root density. Tree size small to medium. Generally highly fruitful. Fruit quality very good.	Exocortis and tatter leaf free budwood. Will grow on wide range of soils, but prefers loams. Intolerant of highly acid and lime soils. Poor drought tolerance.	Incompatible with Eureka lemon and acidless oranges. Compatibility with some minor varieties unknown. Despite accumulating high levels of chloride in leaf tissue does not exhibit obvious toxicity symptoms. Prone to "sudden death".
Troyer and Carrizo citranges	Highly resistant to Phytophthora, tristeza and citrus nematode. Cold hardy. Intolerant of exocortis. Shallow depth of rooting but develops high fibrous root density. Tree size small to medium. Generally highly fruitful. Fruit quality very good.	Exocortis-free budwood. Adapted to wide range of soil types, except highly calcareous soils.	Incompatible with Eureka lemon. Very prone to micronutrient deficiencies, especially on calcareous soils. Compatibility with some minor varieties unknown. Prone to "sudden death".
Swingle citrumelo	Phytophthora and drought tolerant; nematode resistant; tristeza tolerant. More salt tolerant than other P. trifoliata hybrids. Good fruit quality.	Not suited to clay or highly calcareous soils.	Sensitive to overwatering. Incompatible with Eureka lemon and some orange and mandarin cultivars. Overgrows orange varieties. Fruit more prone to creasing.
Cleopatra mandarin	Phytophthora and drought tolerant; nematode resistant; tristeza tolerant. More salt tolerant than other P. trifoliata hybrids. Good fruit quality.	Performs well on both heavy and light soils; best suited to loams. Lime and salinity tolerant.	Tendency to small fruit size. Good drainage and precautions against root rot essential. Slow to come into bearing.
Rough lemon (citronelle)	Susceptible to Phytophthora root and collar rots, citrus nematode. Tristeza and exocortis tolerant. Mycorrhizal dependent. Extensive lateral and vertical root development. Highly drought tolerant. Produces large trees. Yields are high, of good fruit size, but poor quality. Promotes early maturity.	Best on deep virgin sandy soils.	Does not tolerate poorly drained soils. Tendency to accumulate excessive chloride leading to leaf drop. Unsuitable for some mandarins eg. Satsuma and Ellendale tangor.
Sweet orange	Very susceptible to Phytophthora root and collar rots; susceptible to citrus nematode. Tristeza and exocortis tolerant. Mycorrhizal dependent. Intermediate depth of rooting. On well-drained soils in inland areas produces large trees. High yielding with good fruit quality.	Best on deep sandy soils. Sensitive to dry conditions but tolerates calcareous soils.	Does not tolerate excessive soil moisture.
Benton citrange	Resistant to Phytophthora root and collar rots. Compatible with Eureka lemon. With Eureka produces trees of intermediate size and good cropping efficiency.	Exocortis-free budwood. Not suitable for calcareous soils.	Limited experience. Tolerance to nematodes unknown.



Roy Menzies (NSW Agriculture), Bob Nissen and Alan George (QDPI).

This is the technical summary from Horticulture Australia Project No. SF 97007.

Crop regulation of peaches and nectarines was investigated from four aspects – crop loading, market manipulation, chemical thinning and chemical manipulation. Crop loading was the essential precursor to establish the parameters for determining the ideal number of fruit per tree both biologically and economically. Twelve trial sites in five districts provided a range of environments and varieties. At each site five crop loading levels were tested and all yields, growth, fruit quality and market returns were evaluated. The over-riding observation was the diversity of responses in relation to variety, orchard management, tree age and the earliness of the harvest.

The measure of the optimum crop load is complicated and, will vary with tree age, variety and location. Numerous crop loading indices were compared at different sites and provided insight into how to implement crop loading strategies.

- Tree butt or trunk size remains the simplest measure except for the very young and trees past eight years old.
- Fruiting canopy measurements are viable options particularly for older trees.
- Leaf: fruit ratios and canopy efficiency will need to be included in the future, as canopies become shaded and less efficient.
- Fruit position is critical but is difficult to optimise with relatively unskilled labour.

Market and economic returns were the financial and productivity cornerstones of the crop regulation concept. At the market level, the intelligence from the reporting service at the Sydney markets provided industry supply trends and seasonal differentiation. For the three seasons from 1997 to 2000 data provided the following results.

- Fruit size was critical early in the season but price premiums were less later in the season,
- Nectarines returned higher prices particularly with larger fruit but they were, at the same time, more difficult to size,
- The cost of size-differentiated market data is relatively small and should be included as part of the industry market intelligence,
- For formulating crop loading strategies on the individual orchard the average returns were too general.

At the orchard level, light to medium cropped trees matured fruit up to 10 days earlier. For early varieties this gave a major market advantage with up to 25% increase in prices. Mid season and later varieties did not benefit.

Chemical blossom dessicants were included at some of the trial sites in the 1998 season for commercial evaluation.

Although the results were initially disappointing, they did emphasise the need for local grower group evaluation at the beginning and the end of each season. The common problems were delayed application (many flowers had already set) lower than optimum spray volumes and chemical rates and some variety differences. Other experimental sites were conducted concurrently and showed the seasonal differences from 1997 to 2000. Observations included:

- Showy nectarine blossoms were more sensitive than some tighter non-showy peach blossom.
- Follow-up hand thinning was always necessary but if blossom removal was at its biological optimum the final crop load was sometimes below its economic optimum.
- Application in consecutive seasons resulted in earlier blossoming and a more consistent, stronger blossom.
- Consecutive sprays four to five days apart provided a more consistent result throughout the tree.
- Dormancy release treatments provide a more uniform and concentrated blossom.

There are other chemical options for growers to improve the potential crop loading levels of their trees. Cultar® with additional fertiliser provided excellent results in vigorous growing low chill condition. Reduced vegetative growth, increased fruit size for the same load and advanced maturity were all confirmed as positive outcomes from the strategy. A dependency one chemical is generally not satisfactory in the longer term but there may be an alternative and, at this stage, Cultar® is remaining.

Fruit quality is of major importance to the industry especially with some negative consumer reactions and increasing competition from other fruit. Crop loading directly impacted on fruit quality. This has significant implications for customer acceptance and marketing options of early season fruit. Increasing crop load decreased the soluble solid or sugar content of the fruit and increased fruit firmness with the softer and larger fruit from lighter cropped trees growers should market



them more quickly. Heavier crops slightly increased skin colour but this was only a minor factor.

Tree nutrition was examined on most sites and varied according to the crop loading. However, the differences were large in the first season. Manganese was the most sensitive element to changes in crop load with potentially deficient levels occurring at higher crop loads.

Other mobile elements such as potassium also decreased with higher loads but this varied with sites, soils and management. An improved nutritional status was achieved with increased nitrogen plus Cultar® which enabled a better distribution of nutrients within the tree.

A full copy of the report is available from Horticulture Australia phone 02 8295 2300. 



Horticulture Australia

Stone Fruit Rootstock Evaluation

Peter Malcolm, P. Holford, B. McGlasson and S. Newman.

This is the technical summary from Horticulture Australia Project SF 98011.

Despite the world wide use of rootstocks in the cultivation of stone fruit, the response of stone fruit rootstocks to soil temperatures and the methods by which they exert their influence is poorly understood.

A better understanding of both the individual response of different rootstocks to soil temperatures, and the general effects of soil temperatures on the growth of stone fruit, may help growers select the best rootstock for a particular location and can lead to the development of new or improved orchard management techniques for optimising fruit yields and quality.

The research undertaken in this project examined the effect of temperature, and in particular root temperature, on the growth, development and mineral nutrition of peach rootstocks. It also examined potential differences in response to root temperatures, of plants at different stages in their seasonal growth cycle, as well as potential differences between rootstocks in their response to root temperatures.

In these trials it was found that:

- a) peach rootstocks were particularly sensitive to root temperatures;
- b) root temperatures significantly affected both growth and carbon distribution within both actively growing plants, as well as in plants just breaking dormancy;
- c) root temperatures had a significant effect on the mineral nutrition of peach rootstocks;
- d) rootstock cultivars varied significantly in their growth responses to root temperatures;
- e) the roots of peach rootstocks do not appear to have a need for winter chilling; and
- f) seed size affects the germination of peach rootstocks and there is a correlation between seed size and the size of the stone.

This study suggests that in the short term, the adoption by growers of orchard management practices which improve soil temperatures, particularly in spring, will improve tree growth and nutrition. This could be particularly beneficial to those orchardists who grow high value early flowering and maturing varieties of stone fruit, especially in those districts where soil temperatures are low early in the season. In the longer term, further studies could provide further insight into stone fruit growth and development, and potentially lead to improved fruit yield(s) and quality. Such trials could assist:

- a) in the development of new techniques and improved management practices for optimising orchard production and fruit quality;
- b) growers to choose the most suitable rootstock for a particular site;
- c) more efficient and timely fertiliser strategies;
- d) evaluation of newly introduced/imported rootstocks;
- e) breeding and selection of future rootstocks; and
- f) development of more accurate stone fruit development models.

As a result of this study it is recommended that:

- a) in districts which grow early flowering and maturing fruit, growers should adopt orchard management practices that improve soil temperatures in the spring;
- b) Okinawa and Flordagard are the rootstocks best suited to districts that produce early flowering and maturing varieties of peaches and nectarines;
- c) the use of the variety Golden Queen as a rootstock be phased out because of nematode susceptibility;
- d) the removal of small stones, and thus seeds, by screening can improve both the germination and growth of seedling rootstocks.

A copy of the full report is available from Horticulture Australia, phone 02 8295 2300. 

Snack Fruit Conference Report

Sandra Hardy, NSW Horticulturist, Gosford.

What drives the consumer?

Rosemary Stanton

The food supply has changed dramatically in the last 50 years. In the 1950-60's there were 600 foods on the shelves, people shopped daily and walked to the shops. Currently there are 15,000 items on the shelves, people shop weekly and drive to the supermarket. Marketing is very effective – it promotes poor quality but cheap products. If we can supply food 12 months of the year, then we need to explain to the public how we can do this.

Fruit consumption steadily decreases in children from 2-15 years of age.

Age:	2-3	4-7	8-11	12-15
% Consuming fruit:	77%	69%	59%	54%

Public perceptions of food:

- * Concern about integrity of food;
- * 92% want all genetically-modified food labelled;
- * 65% oppose genetically-modified foods;
- * greater interest in organic foods.

What should we do?

We do not have all the information about fruit and vegetables, ie. the health benefits.

- * Stop/Prohibit advertising of junk foods to children;
- * Tax junk food – use some proceeds for education;
- * Ban the sale of junk foods in school canteens;
- * Give people better nutritional information;
- * Lobby for change – start with Ministers for Health;
- * Stand up and speak out about the tactics used.

Product Positioning: Lisa Cork

(The Marketing Department Auckland, NZ):

You need to know the attributes of your product and know what consumers want.

- * Market your product to the right audience/group;
- * Understand the shopper and their needs – make use of it;
- * Understanding your product in relation to the consumer (through their eyes/ideas);

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WHEREVER WE GO, WE MAKE IT GROW

* Stand in the shoes of the shopper, ask questions of the market place.

There is a lack of trust by the consumer – you need to establish and build up this trust again. Use logos such as “Guaranteed sweet” or “Ripe and ready to eat”.

The Wandin Valley experience:

John Corby

Critical mass opens doors you need to work together to achieve this. The Wandin Valley group was established in 1984 and we have 6 key principles:

- 1. Knowledge of consumers:** Rely on your customers for information, to do this, you need to be reliable and on good terms with them.
- 2. Creating and sharing value:** Small producers tend to produce better fruit, so share this knowledge in the group. For example when consumers are buying cherries, you are successful if people can go and buy them by the handful and not have to pick through them individually.
- 3. Get the product right:** Distribution channels can ruin this.
- 4. Product: Ensuring effective logistics and distribution:** Who takes responsibility? If it all falls down, it is the grower who pays the price. Growers need to have good contacts between parties, you need checkpoints along the way, eg. data recorders used along the line to make sure it is all happening right.
- 5. Communication strategy:** Must be two way. There are monthly member meeting for shareholder farms (one Director Representative/Family) and there are four meeting/year where all the family can attend). Contact customers daily. Internal (on-farm) and External (off - arm) communication must be ongoing and continuous.
- 6. Building effective relationships:** Wandin Valley is an informal group. It is working together striving for excellence. All people relationships need nurturing and sustaining. You need to manage this.

Understanding Consumers: *John*

Webster (Horticulture Australia)

Consumers are confused. In a survey of 1,300 NSW consumers about purchasing oranges, we found they purchase on the following criteria, (in order of rating) - Juiciness – sweetness – colour – skin – firmness – size – low price.

80% of respondents intentions when buying food were to look for:

1. Taste
2. Freshness
3. Nutrition

About Consumers:

They are more accurate at measuring what they like compared to the use of objective management tools.
When price is lowest, quality is best;
When price is high, quality is lowest;
They do not understand varieties in general;
Do they all want the same quality?;
Consumers usually walk away, they do not complain;
They will pay a premium for consistent quality

Learning about Consumers: Leo Cirillo

(Horticulture Australia)

Need a 5-10 year consumer research plan that is comprehensive and continuous and collects quantitative data.

Recommendations to industry:

1. Have a Consumer Food monitor;
2. A consumer eater study;
3. Eater Tracking study;
4. Sensory bench market study;
5. Buyer study;
6. Buyer tracking study and product watch;
7. Supermarket data scan.

Consumer Concerns: Matt O'Neil

Australian Consumer Association

Food labelling is currently the biggest issue in food. There are two basic rights of people – safe food and informed choice. Junk food cannot compete with the health benefits of fresh fruit and vegetables. Educate people that “natural” is not perfect. Health claims are coming which will be good for fresh fruit and vegetables. Issues of concern to consumers are irradiation, food safety (residues) and genetic modification.

Although pesticide residue issues can be low in the “hazard” area, they are high in the “outrage” level.

Supply Chains: Martin Kneebone

(RETAILworks) snackfruit@retailworks.com.au

Consumption has been flat for the last five to six years. Nutritious snacks are worth \$312 million/year, natural snacks \$50 million and fresh snacks \$850 million/year (retail market values). The distribution and marketing of these products is larger and more aligned. With prepacks consumers expect to get second grade product, but it is actually more expensive to prepack. Our history as collaborators in export is dismal. Need to work together like other Southern Hemisphere countries, South Africa and South America.

What can we do?

Industry level: Become better at monitoring volumes, prices and competition. Align marketing with the supply

chain. Commit to export, collaborate. Support new products, get the retailers and supply chain involved. Tighten the research and development and explore new distribution channels.

Enterprise level: Support industry level improvements. Know customers and consumers. Build relationship skills. Understand volume, supply and price. Stop selling second grade prepacks.

WORKSHOP SESSIONS

Integrated Fruit Production:

Jim Walker

Apples: (*HortResearch, NZ*)

In 2002 9% of the New Zealand apple industry was organic. Key drivers for change are coming from the UK (UK Organic Food & Farming Targets Bill). Growers receive a 150-100% premium. Apple orchards (in conversion and certified): 1996-1997 – two growers, in 2001-2002 – 120 orchards nationally.

Disease control : Lime sulphur, sulphur, copper, hydrated lime, cultural practices such as grazing/mulching.

Insect control: Biological (mating disruption for codling moth), Bt, pyrethrum, neem oil, soap.

Weeds: Tillage, mulch, ground covers.

Nutrition: Certified compost.

Issues: Lime sulphur reduced photosynthesis (50% reduction) with an added impact on sulphur sensitive varieties, eg. Braeburn. There was also a reduction in fruit size and yield, Braeburn (30%) reduction, Royal Gala (only 5-7%). For thinning we use lime sulphur (preferred) sodium chloride, calcium chloride. The issues with these are russet and leafburn

Stonefruit :

26,000 t – 3% of fruit production, value \$70 million (\$15 million in exports). 330 growers – 12 organic (4%) and apples are the key driver for those 4% of stonefruit growers.

Pests: Leaf rollers – Use Bt® about six sprays as efficacy is lost after 5-7 days. OFM - use mating disruption, need early placement 500/ha and have low OFM at start of season for it to be successful. Thrips - use reflective mulch to repel thrips in spring. Insect control, have tried Success® with a 60% mortality, however we need to develop an “organic formulation”. Pyrethrum and oil.

Disease control: Brown rot – lime sulphur/sulphur. Blossom blight – Trilogy® (Neem) and soft soap. Lime sulphur used as a pre-infection application for Blossom blight with 90% control, but petal burn a possibility. Need to develop new control method for Brown rot eg

hygiene, enhancing resistance, Calcium nutrition, Biological control agents and natural fumigants.

You need to redesign orchards and consider the following: Landscape ecology; Pest and disease management; Tree yield and growth; Understory dynamics; Soil health. The system is very complicated and the whole system needs to be considered. The drier regions are more promising for organics in New Zealand. Organics have a higher financial risk and during the conversion period there are no financial benefits. You need an alternative source of income during this time.

RIRDC PROJECT: *Peter Stevens*

(*QDPI, Stanthorpe*)

In Australia organic apple production is 1% of total production. This project has been running for one year with the trial site in SE QLD. The QLD Breeding program has just bred a Black spot resistant variety. The trial is a close planting 1,250 trees/ha. Using MM106 rootstock and a central leader training system. The project will assess the most promising products for pest and disease control.

Ready to Eat Stone fruit: *Kevin Day*

(*Farm Adviser, University of California*)

Kevin focuses on the production and conditioning side of stonefruit with the research done by Carlos Cristoto.

Defining quality: There is no one universal description. Be careful about the questions you ask, you need to have the right question to get the right answer. Focus on delivering a consistently good experience to customers. Internal breakdown (mealy dry fruit) has been the biggest problem with consumers. The major area where problems were occurring was in transit. Internal breakdown is an old age symptom, anything that delays maturity time will result in more internal breakdown. The greener you pick fruit, the less internal breakdown you have. The increase in subacid (firmer) varieties may negate the use of pre-conditioning.

You can only use sound fruit in pre-conditioning systems and do not use in a Brown rot year. Pre-conditioning has allowed us to enter into a dialogue with sales people.

We negotiate with retailers on prices and delivery volumes (10-12 weeks prior to delivery). Pre-conditioning fruit has a \$0.50/lb premium on shelves. Fruit is labelled on shelves as “Ripe and Ready”® and “Summer Ripe”®. Pre-conditioned fruit has 7-10% of the total market in USA. Retailers prefer pre-conditioned fruit rather than tree-ripened (more variability) fruit. Pre-ripened fruit is made up from lots more smaller growers. When using pre-conditioning systems you need a short transit distance (<500 km. trip). Larger growers with >200,000 cartons/season use pre-conditioning, however, this reflects the size of the domestic (USA) market. Costs I guess about \$0.75-\$1.00 per box extra.

Consumer tests reveal 85-80% prefer fruit when pressure is at 2-4 lbs. Therefore, consumers want softer fruit. Fruit held at 20° for 48 hours reduced internal browning.

Program components in California:

1. Quality Assurance:

\$2-\$4 per box premium for pre-conditioned fruit. Have very extensive record keeping systems with constant fruit monitoring in the field, right through the chain, of fruit temperature, firmness, size, colour, Soluble Solids Concentration (SSC). Not all varieties/blocks can be pre-conditioned. At the packing house monitor temperature, firmness (critical factor), size, red colour, decay. Separate fruit into sizes (small, medium, large) and separate fruit into groups which may/may not go into the pre-conditioning process.

2. Orchards and cultivars – monitoring:

Evaluate orchard factors – pruning, nutrition, irrigation, canopy, crop-load (most important). Pruning and thinning hard gives you the best crop quality, however there are yearly variations, with cooler and warmer years affecting soluble solids etc. Early season varieties are genetically difficult to get really sweet. Some varieties give consistent good quality no matter what you do. The major downfall is that there are lots of factors to consider, you need to ease yourself into it. Shading is a problem in high vigour orchards, there is too much growth and fruit are not suitable to use. Fruit size selection is critical and takes out the variability of other factors.

Select varieties (not early varieties) which have:

- * moderate to slow ripening;
- * tolerant to bruising;
- * low disease incidence;
- * good overall flavour.

July Red is best variety to precondition, others include - Flavorcrest, Rich Lady, June Lady, Rose Diamond and Spring Bright.

3. Maturity/Harvest determination:

Fruit must be at maximum maturity, firm (12 lb. firmness level picked) and the right SSC. Some varieties are very variable with big changes in firmness and SSC, therefore you need good records.

4. Ripening room:

Low air velocity fans used, 20-21°C range with 90-95% relative humidity. Monitor temperature and firmness every 1-6 hours. Fruit go in at 12 lbs and come out at 6-8 lbs. firmness. Take pressure readings on the weakest point (softest part). Pre-conditioning stops internal breakdown with 48 hours at 20°C. Most fruit coming out in 12-16 hours rather than full 48 hours. In transit fruit lose about half a pound of pressure per day.

Advantages: Free of internal breakdown, ready to buy, tasty to eat. Restricted to a normal season – not a Brown rot year. **Disadvantages:** Need to have specific marketing program with reseller and consumer education.

Raincovers:

Norm Gutzwiler, (Pear and Cherry Grower Washington State) and *Graham Minifie* (Netpro Protective Canopies)

Washington State, USA. Not used extensively in Washington State (produce 28,000t cherries), but those that have used it, have experienced almost no cracking. Need to get the rain covers in place quickly. Try to keep them in short runs, but you need to remove them quickly. We have high humidity here and if you do not remove, then this also causes cracking under the cover. Try to put them out only just before a rain event. Cost \$12-\$15,000/acre. Labour to put in/out relatively cheap in the USA.

Structure of raincover:

Large poles are spaced evenly in rows (on each side of row) about 5-10 m apart. High tensile wire is used to form a tent (gable house). There are about five wires to keep it taut. The material does breathe somewhat. We do not cover an entire row in one run, but in bits which allows air movement. We do not move covers between varieties as the covers are very heavy and bulky and start to tear after 4-5 years. The covering material is cheap compared to the structural set up costs. We leave them bundled up when not in use so the covers are only exposed for around six weeks of year. Another system in the UK bunches the cover at the tops of trees however this system is not used in the USA. We sometimes use the covers to prevent frost damage.

New Zealand example:

Design the tree around the cover (central leader). Great increase in temperature high in trees resulting in sunburn on the tops of fruit. You need a 2-3 feet space between the tops of trees and the cover. The structure needs to be able to handle wind. This system tips wind out, has a 5° slope and actually moves with the wind. It's been in for six years, but now the plastic is starting to deteriorate, it will be expensive to replace. The net has paid for itself, with four rain periods in the last six years, in which we have saved the crop.

Netpro Trials

NetPro has been doing a lot of testing with different systems in Stanthorpe. If they did it again, Tatura trellis would be the system to cover, You need to look at a new or an existing young planting target these trees to cover.

Citrus Pruning Workshop Report

Sandra Hardy, NSW Agriculture, Gosford and
Andy Krajewski, Fruit Doctors, Loxton.

On the 29th and 30th of August 2002 coastal citrus growers had the rare opportunity to participate in a special Citrus Pruning Workshop run by citrus pruning expert Dr. Andy Krajewski. Andy was previously a Senior Research Horticulturist with CAPESPAN from 1984 – 2001. Andy now works with the Fruit Doctors an Integrated Pest Management group based in Loxton in SA.

On the Thursday growers started off with a ½ day formal session, which focussed on the theory behind the practice of pruning. This session covered citrus production phases, pruning principles, aims, benefits, and strategies. On Thursday afternoon we headed into the paddock to do the “hands on” demonstrations on navel and Valencia oranges. On Friday morning the practical session focussed on lemons. There is not enough room

in this article to really portray the amount of information presented but we will try to give you some of the main points when pruning oranges and mandarins.

Introduction

Pruning requires you to work with the trees own growth habit and to aim to increase the efficiency of crop management and production. Andy speaks of using pruning to avoid, delay or minimise the adverse effects of what will happen naturally in trees eg the crowding and shift of bearing wood to the upper, outer canopy zones. The aim of pruning is to increase a tree's bearing branch units (bbu's), to simplify the water movement in trees and to improve light penetration into trees. By doing this you should ultimately be able to improve the production efficiency of the tree and increase fruit size and quality. Pruning opens the canopy to light, removes “inferior bearing wood” and stimulates production of regrowth with best bearing potential.



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Tree Growth

Trees have between 3-5 annual growth flushes. These flushes are added to the previous flushes, which results in a drift of wood towards the outsides of trees. Over time these branches become long, spindly and weak resulting in a reduction in fruit size and quality. There are four problems associated with this, the low light intensity causes older leaves to fall, therefore reducing transpiration, therefore water is not drawn up and the branch dies therefore you begin to lose this lower wood and fruit.



Andy explaining the techniques involved in young tree formation and pruning.

Light

Light is “free”. We prune trees to make the best use of this important and free input, without sunburn or photoinhibition of previously shaded leaves! The changes in the light intensity in the tree must be gradual, too rapid a change and the leaves can be damaged permanently and they won’t work.

Sources and Sinks

The leaf is what’s known as a “Source”, that is it produces carbohydrates and sugars to enable the tree to grow, flower and fruit. “Sinks” are areas of demand in the tree, such as flower buds and fruits and these need to be as close as possible to good leaves, the “Source”. Developing sinks must be sited close to abundant,

healthy, active, well-lit leaves. Pruning does this in two ways:

- Increases inflorescence leafiness if done before budbreak in winter resulting in a high ratio of leaves to flowers on these buds.
- Alters canopy “openness” and hence light relationships.

White and Green Blossom

In oranges and mandarins as trees age there is more leafless inflorescences ie. all flowers and no leaves, this is called “white Blossom”. In young trees there is a more leafy inflorescence ie. flowers with small developing leaves as well, this is called “green blossom”. It is the “leafy blossom” that you want. Leafy inflorescences tend to produce a higher fruit set, have a faster fruit growth rate, fruit with a higher sugar content and better colour development.

BBU’s

These are bearing branch units, all trees have both “strong” and “weak” bbu’s. However as trees age they have more weak bbu’s. The characteristics of strong bbu’s include:

- Arise on top surface of scaffold branch
- Short, thick, simple (ie not divided as much)
- Many, active leaves (large dark green leaves)
- Produce superior bearing wood!

Why are “Strong” bbu’s “Superior”?

- Inflorescences three times leafier
- Fruitlets 15% larger diameter
- Fruitlets 2 to 3 times heavier
- Fruit growth rates higher
- Fruits 1 (valencias) to 3 (navels & mandarins) counts larger at harvest
- Water flow (l/hr) rate 2 to 3 times higher
- Daily water flow is more prolonged



This is the type of regrowth that we want from rejuvenation pruning

Production and pruning phases

There are three phases in an orchard's life:

Production phases:	Pruning phases:
Establishment phase	Formation phase 1-7 years
Productive phase	Maintenance phase 8-20years
Decline phase	Rejuvenation phase > 20 years

When doing any pruning don't forget to sterilise your instruments use 1 part commercial bleach to 2 parts water. Carry around a small spray bottle to use when you are pruning. **Always use sterilised instruments.**

Young tree formation

Do this at any time of the year.

- Decide which is the lowest limb (the lowest limb should have about 65cm clearance from the bud union, assuming this is 20m from the soil surface, so all up approximately 85cm from the ground).
- Clean stem below this point.
- Select number, orientation of limbs (3-6) of equal dominance.
- Remove watershoots (they have no place except when used to replace main limbs).
- Thin out "doubles" (arising out of the same bud).
- Shorten low branches.
- Strip ALL fruit for the first 3 years.



Andy discusses pruning options.



Ross Hitchcock gets some hands on pruning experience on young valencias.

Maintenance pruning

Do this slowly over time. Prune after harvest, spend around 12mins per tree per year, and then come back in summer to thin out and reposition regrowth.

- Skirt; **lightly** hedge for containment.
- Remove broken branches.
- Orientate limbs: keep equal dominance.
- Remove weak buds and dead wood.
- Thin out/top regrowth to optimise bearing potential.
- Remove branches that cross over, major watershoots and touching branches.

The right time for maintenance pruning is as soon after harvest as possible:

- "Early" cultivars: in winter, and before budbreak (navels and mandarins)
- "Late" cultivars: in spring etc., after budbreak (Valencias, be more careful with this).

Warning: Watch out for late frosts.

Rejuvenation pruning

Start *before* trees are in advanced decline or too large to manage and as soon after harvest as possible. Choose healthy trees, which are declining due to age and/or shading.

- Thin out tree crowns (2-4 cuts: >120 mm diameter)
- Shorten lower limbs
- Encourage/manage regrowth
- Hedge trees back into line gradually (<60 mm diameter)

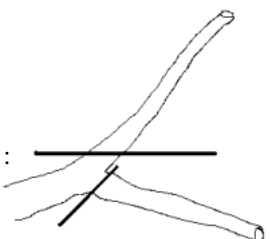
NB: do this over three years, not in a single season

Commonest problems with pruning?

- Choosing the wrong spacing
- Leave trees to grow "naturally"
- Pruning too heavily, too late in year
- Sunburn
- Ignoring regrowth
- No dead wood removal

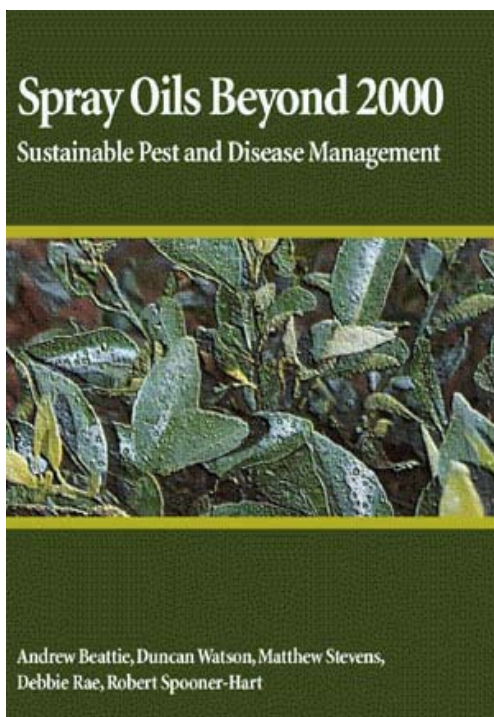
Pruning cuts:

1. Rejuvenation cut : encourages regrowth



2. Removal cut : discourages regrowth

What's new in Publications



◆ Spray Oils Book

Proceedings of the "Spray Oils Beyond 2000 - Sustainable Pest & Disease Management" conference held in Sydney in October 1999. This 600 page book contains over 70 papers presented at the conference and is a valuable reference tool.

Copies of the book can be ordered by logging on to the Spray Oils Beyond 2000 website at <http://sprayoils.uws.edu.au/menu.shtml> or Phone 02 4570 1287. The book costs \$175 + pp.

◆ 2nd Edition of The Good Bug Book

This new edition contains descriptions of 12 new beneficial organisms and includes a toxicity table of common chemicals to beneficial insects. A good resource for IPM.

Contact: Integrated Pest Management Pty Ltd.
Phone: 07 4165 4663
or Email: www.info@bugsforbugs.com.au
\$38.50 + \$6.00 pp.

◆ Orchard Plant Protection Guide for Deciduous Fruits 2002-03

Now available on the web. Go to www.agric.nsw.gov.au/reader/orchardguide

◆ Best Practice Guidelines Horticulture in the Sydney Drinking Water Catchment. Copies available from the Windsor Office.

New Agfacts:

◆ Fig growing in NSW. September 2002. Agfact H3.1.19

◆ European pear varieties. March 2002. Agfact H4.1.13

◆ Raspberry growing in NSW. May 2002 Agfact H3.1.46

◆ Dangers in feeding waste material to live stock. Agnote DAI-181

Available on the NSW Agriculture's website www.agric.nsw.gov.au - go to Horticulture or phone 02 6391 3458.

Websites

◆ NSW Agriculture Environmental Management Systems (EMS) Web Page

NSW Agriculture now offers a number of EMS resources on-line. Please see <http://www.agric.nsw.gov.au/reader/11441> Feedback on these resources is always welcome.

What's on

◆ 11-12 October 2002. Australian Olive Association National Conference Adelaide, SA.

For more information contact: R Mailer
Phone: 02 6938 1818

◆ 17 October. Australian National Field Days, Orange. Phone: 02 6362 1588

◆ 23 October Water Week Field Day

NSW Agriculture will be holding a Field Day on the latest developments in regard to Water Sharing Plans and also soil moisture and weather monitoring equipment at Milbrovale vineyard, Milbrodale Rd. Broke. For further information contact Norm Cross or Michael Cashen. Phone: (02) 49398940

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COASTAL FRUITGROWERS' NEWSLETTER

The Coastal Fruitgrowers' Newsletter is a quarterly publication distributed in Spring, Summer, Autumn & Winter. It is available free to all commercial fruit growers in the Sydney Basin, Central Coast, Hunter Valley, South Coast & North Coast areas.

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