



COASTAL FRUITGROWERS' NEWSLETTER

ISSN 1446-0513

INSIDE

Liquid Reflective Mulches	3
North Coast Stonefruit Thinning Field Day Report	4
Graham Thwaite Retires	7
Leaf Mineral Concentrations in Peaches Affected by Root Tem- peratures and Phenology	9
National Summerfruit IPDM Manual Underway	11
Registered Chemicals for use in Citrus : October 2004	12
NSW Coastal Cittgroup Field Day Report	17
National Citrus Plantings Database - NSW Update	21
Summerfruit 2004 Conference Report	22
Whats the Future in Soil Fumigation Seminar Report	24
drumMUSTER Collection Sites and Dates	25
News in Brief	25
Green Tea Field Day Report	26
What's On and Whats New in Websites and Publications	27



NSW DEPARTMENT OF
PRIMARY INDUSTRIES
Coastal Fruitgrowers' Newsletter
Edited by Sandra Hardy
Design & Layout -
Cathryn McMaster

No.54 Spring 2004

Dear Growers

Welcome to the Spring edition for 2004.

In this issue there are a number of reports on recent field days, seminars and conferences. For stonefruit growers there are summaries from recent events run by Low Chill Australia on the north coast of NSW.

For citrus growers there is information from the latest Cittgroup event, including the research work being done at Dareton on Ralex® and variety evaluation. There is also the final recommendations from the national lemon rootstock - variety trials.

There is also the annual update of registered chemicals for use in commercial citrus orchards.

Important information on collection dates and sites for drumMUSTER can be found on page 25.

Once again check out the "Whats New" and "Whats On" sections on Page 27.

Happy reading.

Sandra Hardy

Welcome to NSW Department of Primary Industries

NSW DPI brings together departments previously known as State Forests, NSW Agriculture, NSW Fisheries and NSW Mineral Resources into a "one stop shop" for primary producers. The new website is at www.agric.nsw.gov.au/reader/nsw-agriculture

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 NSW Department of Primary Industries 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 Department of Primary Industries



EASY Liquids

	EASY N	EASY KS	EASY ATS	EASY Cal	EASY PK
Analysis (w/v)	42.5% Nitrogen Total (21.5% Nitrogen as Urea 10.5% Nitrogen as Ammonium 10.5% Nitrogen as Nitrate)	30% Potassium as thiosulfate 25% Sulfur as thiosulfate	16% Nitrogen as ammonium 34% Sulfur as thiosulfate	12.6% Nitrogen as nitrate 18.1% Calcium as nitrate	1% Nitrogen as ammonium 12% Phosphorus as water soluble 24% Potassium as phosphate
Specific Gravity	1.32 kg/L (1000L weighs 1320kg)	1.48 kg/L (1000L weighs 1480kg)	1.325 kg/L (1000L weighs 1325kg)	1.5 kg/L (1000L weighs 1500kg)	1.4 kg/L (1000L weighs 1400kg)

Nothing's easier to use than the EASY LIQUIDS range of concentrated nutrient solutions. They're efficient, save you time, labour and wastage, and give you plenty of application flexibility. What's more, getting your hands on the 200L pack, the 1000L Pallecons or Bulk Tanker loads is as easy as calling your local Incitec Fertilizers Dealer.

Incitec
FERTILIZERS
 Certainty. In an uncertain world.

Technology Update - Liquid Reflective Mulches

**Phillip Wilk, District Horticulturist, NSW DPI,
Alstonville.**

Many horticultural industries including stone fruit, strawberries, pome fruit and cherries have used white reflective mulches to improve fruit colour before harvest.



The use of white plastic reflective mulch has been trialled on a number of stone fruit orchards in Southern Queensland and Northern NSW for the last two seasons. A variation of this plastic mulch, which is a liquid calcium product that is applied with a boom spray, is being trialled on one North Coast stone fruit orchard this season.

Coastal stone fruit trees are very vigorous and pre harvest pruning of watershoots and suckers is essential to allow light into the tree canopy to colour fruit. Pre-harvest pruning is often neglected on many farms where harvesting of early varieties is usually taking place and the labour to employ more pruning labour would be uneconomical.

By applying reflective plastic mulches under trees, light can be reflected up into the canopy which although not a substitute for watershoot removal, dramatically improves the colouring of fruit low down on the tree.

Plastic mulch is 1.2 metres in width and is usually rolled out after fruit thinning has finished and rolled up just before harvest. It needs to be pegged down to stop being blown by the wind. It can be laid on both sides of the tree or in some cases on the shady side if rows run in an east-west direction.

A new calcium based liquid, reflective mulch product called *Sunbrite*® is being trialled on a property near Bangalow NSW. The product is applied with a boom spray, is rain fast, and will last from 3-5 weeks under normal rainfall and irrigation conditions.

Sunbrite® is applied using floodjet nozzles in a 1.4m wide strip at a rate of 150mls /m² plus water in a 50/50 mixture (300mls/m²).

The cost of the liquid mulch product equates to \$2000 per hectare to buy and apply or 35-40 cents / m². Reflective mulches, although approximately \$5000 per hectare have the added advantage of being reusable and may last three to five years.

Ground preparation is important when using *Sunbrite*® and all weeds need to be removed before applying the product. The product dulls when wet but on drying brightness increases. The liquid mulch dries quickly on application and so spray tanks will need to be flushed quickly after use.



One added benefit in applying this liquid calcium mulch may be the increased availability of soil calcium, an important nutrient involved in maintaining fruit quality.

It is important when trialling any new product to always leave a control area of unsprayed trees of the same variety for comparison and to also calculate its cost benefit.

Further technical information may be sourced from Ultimate Fertilisers 1800 003 244. 🌳

North Coast Stonefruit Thinning Field Day Report

Phillip Wilk, District Horticulturist, NSW Department of Primary Industries, Alstonville.

NSW Department of Primary Industries (DPI) and Low Chill Australia (LCA) ran a very successful fruit and flower thinning field day at Cooper's shoot orchards near Bangalow on 28th July.

It was a fantastic mild winter's day and was well attended by over 40 growers from the district.

This field day was a follow up to the two previous field days held this season that focussed on crop regulation, winter and summer pruning.

Over the past two years, many older low chill stone fruit growers have retired and new owners have purchased orchards in the area. New owners and managers have requested that Low Chill Australia together with NSW DPI provides some instruction on basic orchard management techniques.

Three very experienced low chill stone fruit growers Gordon Shultz, Rick Dali and Geoff Prior agreed to outline and show growers the methods they employ on their own farms to fruit and flower thin and the reasoning behind what they do.

As with the two previous field days, this day also created a great deal of interest and lively discussion on the merits of the different thinning techniques.

Winter pruning was the first method they used to thin fruit by removing one half to two thirds of the previous season's wood. This however does not space the remaining fruit on the tree so hand thinning is a must.

All three of the demonstrators thinned flowers and fruit differently which related to the labour they employed on their farms. It was more of an economic decision on the way they removed flowers or fruit and just how they spaced the remaining fruit on the tree.

Horticultural Fertilizers

For all your fertilizer needs

- Fertilizer Programs
- Custom Blends
- Soluble Fertilizers
- Liquid Fertilizers
- Slow Release Fertilizers
- Controlled Release Fertilizers
- Organic Blends
- Trace Elements
- Soil & Tissue Testing



For quotations, technical visits or account enquiries, please contact us at:

Paton Fertilizers

126 Andrews Road
Penrith NSW 2750

Freecall **1800 644 753**
Deb Murray **0418 428 898**

WHEREVER WE GO, WE MAKE IT GROW

Many growers said they did not have enough time to thin flowers carefully and they often removed more flowers than they wanted to at that time. This however later saved a great deal of time (and labour) in removing small fruit and increasing the size of the remaining fruit.



Growers said they were often still pruning later varieties while early varieties such as Flordaprince were in full flower and they did not have the time to flower thin them without employing extra labour.

Other growers said they were in frosty areas and so were more cautious in removing a huge number of flowers in case of a late frost.

Gordon demonstrated how he ran his hand along the back or upper surface of the lateral to remove any flowers facing upwards. He then removed any flowers or buds close to the junction of the lateral and the leader. He removed flowers on the tip of the lateral and left one hand span between any remaining flowers.

Most laterals had between two and four flowers remaining with the chance to later thin off one or two more once the fruit is set.

Gordon also removed small shoots that were on the lateral which he feels tends to absorb nutrients at the expense of the small developing fruit. He tended to leave flowers that were close to a large node with expanded leaves.

Geoff Prior tended to thin like Gordon Shultz. They both thinned flowers to an estimated number of fruit that they were expecting to harvest from a tree of a certain size.

The third grower, Rick Dali was more precise in his flower thinning. He removed more flowers but he was very selective in where they were removed. His thinning time was much greater than the others but he explained that he spent very little time later removing small developing fruit.

His aim was to spend more time on flower thinning and not spend time later in fruit thinning. He said it was easier for him to see flowers now where later he always missed small green fruit as there were more leaves in the way.

He also said that contract labour often missed green fruit because of the developing leaf but they could easily spot the flowers early in the season and they therefore did a better job.

One thing that everyone agreed on was that fruit and flower thinning is a very necessary operation but a very expensive one. The cost of thinning was estimated to be close to \$2.00/tray (total production cost of a tray is \$10).

The time it takes to flower thin a vase shaped tree is 20-30 minutes and for a palmette tree, 15-20 minutes. If you employ contract labour, the cost of that labour is \$18.50/hr. Then you also have the cost of going back and removing small fruit once flowers have set.



There was also some discussion on the merits of using chemical flower thinners to reduce labour costs. The two chemicals that are registered for stone fruit are *Ralex*® and *Armothin*®.

Ralex® is a gibberellic acid that is sprayed onto foliage in the late summer which then inhibits bud initiation for the following spring. Using *Ralex*®

poses a dilemma for Low Chill growers. The majority of growers need to use summer pruning to control tree size and allow light into trees for bud initiation. This will unfortunately remove much of the wood that will contain budwood for the following season's fruit and which would also be sprayed with *Ralex*®.

Armothin® is used to reduce the numbers of flowers by burning the flower stigma. It could be used in varieties that have an extended flowering period.

However no chemical thinners are a substitute for hand thinning of either flowers or fruit. All chemical thinners will only ever be a supplement to hand thinning. They may remove flowers or stop flower initiation but they are still not capable of evenly spacing the remaining fruit.

Some tips that emerged from the field day in relation to thinning

- It is far easier/quicker to thin flowers than fruit.
- If late frost is a problem in your area then don't over thin flowers.
- Fruit /flowers on the outside of the canopy are always better in size and colour than fruit inside the canopy.
- On palmette trained trees, leave more fruit and flowers on the top tiers than lower down.
- Thin trees to a known number of flowers or fruit on a lateral (2-4 fruit per lateral).
- Space fruit and flowers one hand span apart so they will not rub.
- Remove fruit close to the junction of the main leader and a lateral.
- Remove fruit on the top of the lateral.
- Remove any double flowers or fruit.
- Remove any damaged fruit.

Water Monitoring

Peter Cochrane the irrigation specialist for Northern Rivers Rural Buying Services spoke on the merits of using the 'Soil Spec' tensiometer system. He demonstrated to growers how to set up the system in an orchard, how many tensiometers to use and what sizes are needed.

The topic of monitoring water has been very timely as the Northern Rivers has had well below our

normal rainfall this season. Most trees are looking very healthy at present as disease has been at a minimum this year due to the low humidity. With flowering and fruit set in full swing now, growers will need to begin irrigating to maintain this developing fruit.

Graeme Robertson Irrigation Officer from NSW DPI at Wollongbar explained some past research work involving irrigation of low chill stone fruit. He offered growers some advice relating to past research work on monitoring and scheduling irrigation during the previous stonefruit season.

This advice came from work which involved increasing the frequency of water application from once per week to 2-3 times per week by closely monitoring soil moisture levels. This improved the grower's returns on the monitored block that season by a massive 30% in comparison to the control block.

Thanks go to Gordon Shultz, Rick Dali and Geoff Prior for their input and to Greg Foster for the use of his orchard.

◆ New Summerfruit Industry Services Manager

Brad Mills, the new Summerfruit Industry Services Manager can be contacted on

ph: 03 9852 7637, fax: 03 9855 2574 or email Bradley.mills@horticulture.com.au

For further Summerfruit Australia Ltd news visit: www.summerfruitaustralia.com.au

Desire Pest Control Products

Pheromone traps and lures available for:

- San Jose Scale
- Codling moth (CM) 1mg and 10mg lures.
 - Light Brown Apple moth (LBAM).
 - Oriental Fruit moth (OFM)
- Heliothis punctigera and armigera
 - Californian Red Scale
- Light Brown Apple moth (LBAM)

**Contact: Russell Fox
0358 711 650 Mob 0428 570 394 or
Email foxyden@bigpond.com**



Graham Thwaite: Special Entomologist (Stone and Pome Fruit) Retires

Delia Dray, Program Leader, Quality Assurance Horticulture, NSW DPI, Orange.

Having spent over 37 years working with the major insect pests of apples and stone fruit, Graham has now decided it's time to fold up the hand lens and will retire from the Department in September this year.



During this time he has built up a huge wealth of knowledge that makes him truly an internationally recognised expert of codling moth.

Graham commenced as a trainee in 1967, and following a few months in Sydney was relocated to Bathurst Agricultural Research Station in 1968, where he embarked on his life-long quest of developing an integrated approach to managing codling moth and mites. In 1980, with new facilities being built at Orange Agricultural Institute, he relocated with his family and continued working in temperate fruit pests in collaboration with Col Bower, Les Penrose and Jill Campbell, plus many interstate colleagues.

Graham's main focus has been on developing pest management options which reduced the reliance on

the use of chemical pesticides. Graham commenced his career at a time when the impact of pesticide usage was first being observed on the environment. His guiding philosophy has always been to develop a safer environment for both human health and the orchard ecosystem, and to reduce the risk of pest resistance development.

He has made some notable contributions to helping fruit growers manage their pest complex better such as developing IPM strategies for codling moth control, including documenting the first instance of azinphos-methyl induced resistance; the practical implementation of pheromone traps and lures; the evaluation of "soft" chemical options such as insect growth regulators; and the development of mating disruption as an additional tool for growers.

Graham is acknowledged as being one of Australia's foremost authorities on codling moth, evidenced by acting as a consultant in the Western Australian eradication programs during the 1990s. Graham's expertise is recognised internationally, through being invited to co-chair the first-ever codling moth symposium at the International Entomology Conference in 2000, as well as being invited to attend the International Atomic Energy Agency in Austria to discuss sterile insect treatments for codling moth. He has also been invited to speak at conferences in China, New Zealand, Italy, Switzerland, Germany, the US and Canada on aspects of his work.

He also developed an integrated approach to mite control. With the first evidence of resistance being found in the 1980s to new generation miticides, Graham quickly implemented a screening program and was able to demonstrate the causes of resistance and come up with a resistance management strategy. This helped to avoid major losses from uncontrollable mite build up. He was also responsible for overseeing the introduction of predator mite species and dispersal through NSW orchards, resulting in cost savings in the millions.

In addition to codling moth and mites, Graham has also been involved in researching San José scale, green peach aphid, woolly aphid, carpophilus beetle and Oriental fruit moth.

More recently he has been developing IPM strategies for the prune industry, where he has been able to apply his considerable knowledge to helping prune growers manage a different pest and disease complex. He is now supervising a research project investigating fruit tree borer, a significant pest of all stone fruit varieties.

With over 300 publications to his credit, Graham has always been diligent in ensuring that research results were immediately available through both written reports and newsletter articles, and also via presentations at grower meetings, workshops and conferences. Perhaps his greatest pride and joy has been editing the Orchard Plant Protection Guide, now in its 44th year of continuous publication.

Graham's high international profile is a fitting tribute to his expertise and knowledge, which was also recognised when he received the prestigious

Graham Gregory award in 2000 for excellence in horticulture research and development. His contribution to industry has been the reduction of pesticide applications for codling moth from around 7 broad spectrum insecticides in the 1970s to only 1 or 2 now which are used in conjunction with other methods; and for mites, a reduction from 3 to 4 acaricides to now 1 application at half the rate.

As many growers have already commented in learning of his retirement plans, Graham will be missed for his practical advice and no-fuss solutions to managing insect pests. He has become an adjunct Professor at the University of Western Sydney and will continue to supervise student research programs. His immediate plans are to do a little travelling with his wife Margaret, and to catch up on his writing, as there are dozens of boxes of data from trials still left to explore.



ORGANIC FERTILIZERS

(Leppington) Pty. Ltd.

Phone: (02) 4773 4291

Fax: (02) 4773 4104

1755 The Northern Road, Bringelly, NSW 2171

A.C.N. 001 123 726

"THE SOIL IMPROVERS"

VIBREX HORTICARE

POSTHARVEST WASH FOR FRUIT AND VEGETABLES

The most efficient way of controlling postharvest fungal problems is via good farm hygiene. The use of **Vibrex Horticare** in fruit and vegetable wash tanks and sprays is an effective way to kill fungal spores on the fruit before going into storage or market.

Vibrex Horticare is stabilized chlorine dioxide, which unlike chlorine is not affected by organic loading, pH range and does not form trihalomethanes.

Blue mould is the most common and costly postharvest disease. With the correct use of **Vibrex Horticare** blue mould will be destroyed. **Vibrex Horticare** also kills *centre rot*, *stem end rot*, *anthracnose*, *sooty mould* and *bacterial canker*. The best way to keep these pathogens at bay is the regular use of **Vibrex Horticare**.

Vibrex Horticare will keep your produce looking fresher and provide improved shelf life into supermarkets and retail outlets. Application of **Vibrex Horticare** on picking, packing and storage bins will eliminate the problems associated with unwanted fungal spores when being picked transported or stored.

If its Service - Contact **ORGANIC FERTILISERS**
- the **TEAM THAT CARES**

For further information on any product ring Sue, Alan or Chris on
02 4773 4291

Leaf Mineral Concentrations in Peaches are Affected by Root Temperatures and Phenology

Peter Malcolm, District Horticulturist, NSW Department of Primary Industries, Windsor.

Many orchardists regularly use leaf analyses to assess the nutrient status of their peach and nectarine trees. However many are unaware that such leaf mineral concentrations are heavily influenced by both plant phenology (normal seasonal changes in the plants life cycle) and root zone temperatures (RZT).

Recent trials at UWS (Hawkesbury) with the peach, Green Leaf Nemaguard demonstrated that in stone fruit, there are considerable seasonal differences in the concentration of the various mineral nutrients in leaves, with concentrations varying depending on the plant's phenological stage.

Figures 1–3 illustrate the differences in leaf concentrations of nitrogen (N), phosphorus (P) and potassium (K) at two different phenological stages namely at bud-burst (BB) and also during mid season when plants are actively growing (AP). Leaf concentrations of these particular nutrients are significantly higher shortly after vegetative bud-break than they are mid season when the plants have been actively growing for several months. The same observation has also been reported in another deciduous crop, Kiwifruit, where there are also considerable differences in plant phenology and where leaf concentrations of these nutrients are also naturally much higher shortly after vegetative bud-break.

This means that in peaches and nectarines, concentrations of N, P and K in leaf samples taken soon after vegetative bud-break can appear to be excessively high, sometimes even at toxic levels, when compared with the standards established for leaf samples taken in late January, the normal time for such samples to be taken. From a growers perspective this highlights the importance of taking leaf samples at the appropriate time of the year (phenological stage) for analysis and comparison with established standards. If samples are taken at other times of the year and compared with the established standards, the conclusions drawn from such comparisons may give a false impression of the mineral nutritional status/health of the plant.

The other finding that came out of the trials, was that in peaches, root zone temperatures (RZT) had a significant impact on leaf mineral nutrition and in particular the leaf concentrations of nitrogen, phosphorus and potassium at different phenological stages. This was despite air temperatures for all treatments being the same. In both actively growing and bud-break plants (plants exiting dormancy) there was a positive correlation between RZT and leaf concentrations of these nutrients. At RZTs of 20°C leaf concentrations of nitrogen, phosphorus and potassium were much greater than at lower RZTs (Figures 1 to 3). In all trials, diurnal variations in RZTs also affected leaf concentrations of these nutrients (Figures 1 to 3).

Changes in leaf colour were also associated with differences in leaf mineral concentrations, in both bud-break and actively growing plants. This was particularly so for bud-break plants. When plants were exposed to lower RZTs, leaf nutrient levels were often so low that plants frequently showed typical nutrient deficiency symptoms such as leaf discoloration and interveinal chlorosis (Figure 4). These symptoms were particularly severe in bud-break plants exposed to low RZT.

Normally in the spring, soil temperatures lag behind air temperatures. Low soil temperatures during vegetative bud-break, reduce the ability of the plant to absorb/mobilize mineral nutrients, consequently affecting leaf mineral nutrition, leaf development and prolonging the time the plant is dependant upon stored reserves for fruit development rather than photosynthates produced by the leaves. This is particularly important in the early stages of fruit development, and, may influence fruit size and yields. For this reason, cultural practices which raise RZTs, especially in those peach and nectarine varieties which flower early, may be quite beneficial in those districts which normally experience low spring RZTs.

In summary, because leaf nutrient levels vary with plant phenology, it is important that leaf samples for analysis be taken at the appropriate time if they are to be compared with established standards to establish nutrient deficiencies, normality or

toxicities. Secondly, if orchardists are measuring leaf nutrient levels from year to year for monitoring purposes, then leaf analyses need to be taken at the same time of the season to obtain valid seasonal comparisons. Thirdly, orchard cultural practices which increase soil temperatures in the spring and/or which reduce diurnal variations in soil temperatures, such as the selective use of mulches, may have beneficial effects on the mineral status of plants.

In some crops such as Kiwifruit, leaf mineral standards have been established for different phenological stages in the crops development e.g. at vegetative bud-break, flowering etc. This information can be very useful. It means that leaf analysis can be taken at different phenological stages thus allowing growers to accurately monitor the nutritional status of their plants at different times throughout the season and if necessary take timely remedial action to correct potential problems. Although such information is currently unavailable to Australian stone fruit growers, it could be useful for the early detection and the timely correction of nutritional problems.

Figures 1-3. Mean (n =10) concentrations (mass/mass) of nitrogen, phosphorus and potassium for the peach, Green Leaf Nemaguard, after six weeks of being subjected to different RZT treatments. The plants were either actively growing at the time the treatments were applied or were at bud-break. Within each graph, means accompanied by the same letter are not significantly different ($P \leq 0.05$).

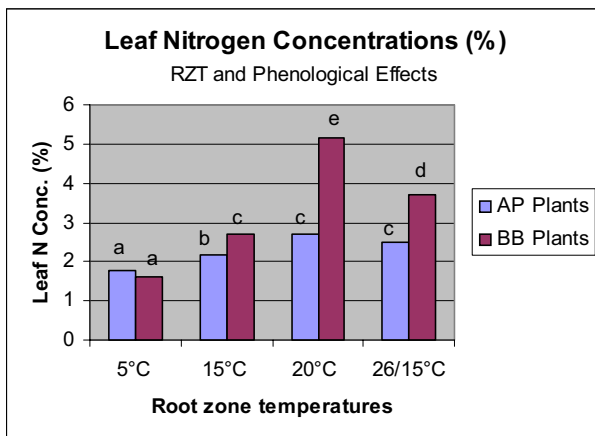


Figure 1: The effects of RZT and plant phenology on leaf N concentrations.

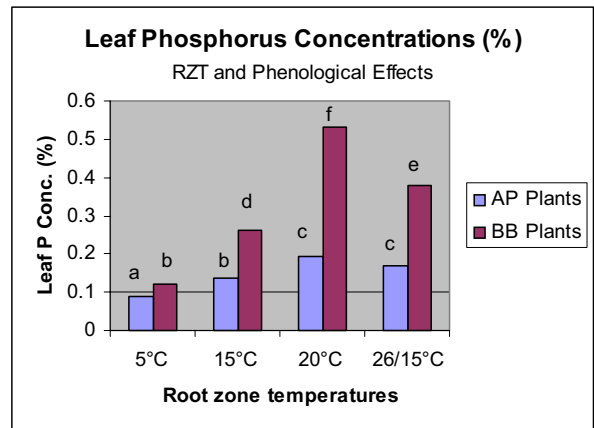


Figure 2: The effects of RZT and plant phenology on leaf P concentrations.

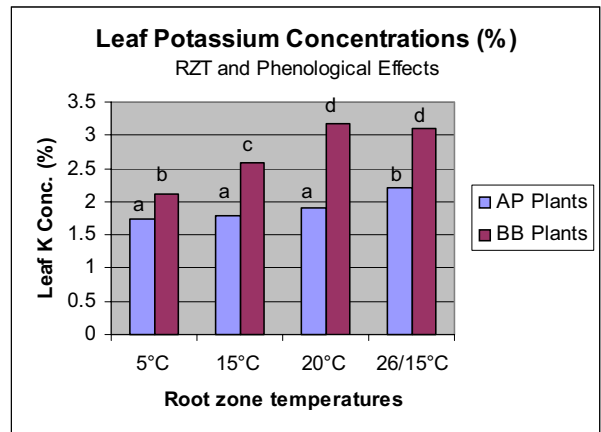


Figure 3: The effects of RZT and plant phenology on leaf K concentrations.



Figure 4: At low root temperatures, peach plants showed mineral deficiency symptoms.

National Summerfruit IPDM Manual Underway

**Shane Hetherington, Plant Pathologist, NSW
Department Of Primary Industries, Orange**

The development of a national Integrated Pest and Disease Management (IPDM) strategy for summerfruit orchards is well under way. During 2005 all orchardists who pay a levy to Summerfruit Australia Limited will receive a copy of the National IPDM Manual. The manual will provide information on how to control the 9 most troublesome insect pests and the 9 most troublesome diseases in an IPDM orchard. It will also contain information specific to your region, some general principals on establishing and maintaining an IPDM orchard and a section on management of birds in orchards.

The manual is the result of co-operation between Australian summerfruit orchardists, researchers and extension specialists. During the information gathering phase of the strategy, 66 peach orchardists, 65 nectarine orchardists, 50 plum orchardists and 31 apricot orchardists from around Australia were asked what their major pest and disease problems were. This series of interviews took place before and after the 2003/04 fruit season. Many of Australia's orchard regions were in the grip of a long-running drought. The interviewees were asked to compensate for the possible reduction in pest and disease problems due to the drought by recalling their problems over the past 10 years ago. This information was then used to make sure that the manual contained the information which was most relevant to Australian orchardists.

The manual will provide the most up-to-date information on pest and

disease management from Australia and overseas.

A draft of the manual will be ready early in 2005. It's important to make sure that the manual contains practical advice which will be helpful to the industry. Orchardists have been involved in every stage of production and the draft will be sent out to a group of orchardists for their suggestions on how to improve it.



MORE MUSCLE!

INTELLIGENT PEST MANAGEMENT WITH PUNCH.

Success, the heavy-weight insect control, is the perfect contender for Integrated Pest Management (IPM) programs that need muscle and flexibility to knock out pests while minimizing soft on benefits of trees. Formulated from naturally occurring metabolites, Success has an excellent environmental profile, giving you cleaner, healthier orchards and bigger yields. Now that's success!

Get more information on putting Success to work in your spray program. Call Dave AgriScience on 1800 733 096.

Success

Dave AgriScience



Registered Chemicals for use in Citrus Crops : October 2004

Prepared by Sandra Hardy, NSW DPI, Gosford.

The following tables on pages 13-16 list the current registered chemicals for use in *commercial citrus orchards* for post-harvest treatment (Table 1); and to enhance fruit quality (Table 2); control of pests (Table 3); control of diseases (Table 4). Chemical names have been used because there are too many products to list. This information has been sourced from Infopest, July 2004.

The tables are not comprehensive in that they do not list chemicals or use patterns for grapefruit or general categories such as orchards or fruit trees.

These tables do not contain all the information which appears on a product label. **ALWAYS READ THE PRODUCT LABEL.**

In Australian citrus orchards an integrated approach to pest and disease control is well established. Integrated Pest Management or IPM relies on using a range of control options to keep pests below economically damaging levels. These control options include biological, cultural and chemical control strategies. Managing pests or diseases in your orchard involves:

- correct identification of the pest/disease;
- some understanding of the life cycle of and conditions favouring the pest/disease;
- regular monitoring of the trees (leaves, fruits etc) for both pests and predators;
- correct choice and timing of the control.

Horticultural and agricultural mineral oils (AMO's and AMO's) are widely used in Australian citrus orchards as part of this integrated approach to pest management.

One of the most important things to remember with oils is that they need to be applied at high volumes to work successfully for insect control. Oils work mostly by suffocating pests or altering their behaviour so a good film of oil needs to be applied to plant surfaces such as leaves, fruits, twigs and branches.

Control of pests can also be limited to single trees or blocks of trees. For example, this is appropriate if you have an outbreak of scale in a few trees. By

the early strategic use of a control measure, be it chemical or biological, a potential major pest problem may be avoided.

In order to maintain a healthy balance of beneficial insects in your orchard avoid the use of broad spectrum chemicals that can be toxic to these good insects.

For a complete reference on Citrus pests, their identification and management, purchase a copy of "*Citrus Pests and their natural enemies*" (1997). Contact DPI bookshop Ph: 1800 816 541.

Key to Abbreviations in Tables

NA = Not Applicable NS = Not Stated

✓ Registered for use on this crop

Bolded are new entries since the Spring 2003 edition

OUP = Open Use Permit, Number (No) refers to the Australian Pesticides & Veterinary Medicines Authority (APVMA) permit number. Open Use Permits are normally issued for only a limited time. Therefore persons wishing to use a chemical in a manner approved under permit should obtain a copy of the relevant permit from the APVMA and must read and comply with all the details, conditions and limitations on the permit.

Out Now

The 2nd edition of Citrus Diseases and Disorders has just been released.

This 44 page colour book written by Pat Barkley contains information on diseases of fruit, leaves and twigs; root and trunk diseases; viruses and physiological disorders.

The book costs \$33.00 (including postage and handling). Contact our bookshop on (02) 6391 3994 or 1800 028 374 to order your copy today.

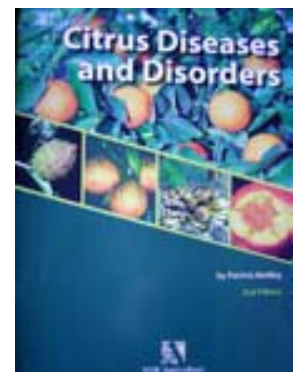


Table 1: Registered products for postharvest treatment of citrus

Pest/Disease/Other	Active Constituent in Product	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons
Bactericide	iodine	NA	✓	✓	✓	✓ and limes
Blue/Green Mould	carbendazim	NA/NS	✓			
Blue Mould	guazatine	NA	✓			
	imazalil	NA	✓			
	imazalil sulfate	NA	✓			
	SOPP	NA	✓			
	thiabendazole	NA	✓			
Colour Retention	2,4-D-dma	NA	✓			
Fungi	iodine	NA	✓	✓	✓	✓ and limes
Green Mould	guazatine	NA	✓			
	imazalil	NA	✓			
	imazalil sulfate	NA/NS	✓			
	thiabendazole	NA	✓			
Old Fruit Fly	dimethoate	OUP No. 6388	✓			
Sour Rot	guazatine	NA	✓			
Light Brown Apple Moth	liquid hydrocarbons	NS	✓			
Mealybugs	liquid hydrocarbon	NS	✓			
Melanose	thiabendazole	NA	✓			

Table 2: Registered products for improving fruit quality in citrus

	Active Constituent in Product	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons
Adhesion control	lauryl alcohol ethoxylate	NS		✓	✓	✓+ limes
Colour Improvement	2,4-D-dma + GA	NA		✓	✓	
Drop Prevention/Reduction	2,4-D-dma	NA		✓	✓	
Quality Improvement	gibberellic acid	NA		✓		✓
Rind quality maintenance	2,4-D-dma	NA		✓	✓	
	gibberellic acid	NA		✓	✓	✓
Thinning	ethephon	NA		✓	✓	
	giberellic acid	NA			✓	
Creasing reduction	gibberellic acid	NA		✓		
Other						
Spray additive	vegetable oil	NA	✓	✓	✓	✓
	alkyl polyglycol ether					
	lauryl alcohol ethoxylate	NA				
Spreader	lauryl alcohol ethoxylate			✓	✓	✓ + limes

Table 3: Registered products for pest control in citrus

Pest	Active Ingredient	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons	Limes
Ants	Chlorpyrifos (OUP No.70A)	14	✓				
Aphids	Azinphos-methyl dimethoate	14 7	✓ ✓	✓	✓	✓	✓
Black (Brown Olive) Scale	Azinphos-methyl petroleum oil	14 1	✓ ✓				
Black Citrus aphid	maldison pirimicarb parathion-methyl	3 2 14	✓ ✓	✓		✓	
Broad Mite	abamectin	7	✓				
Bronze Orange Bug	dimethoate maldison	7 3	✓ ✓	✓	✓	✓	✓
Brown Citrus Rust Mite	abamectin sulfur wetttable sulfur zineb mancozeb	7 0-1 on some products 1 7 NA	✓ ✓ ✓ ✓ ✓				
Bugs	dimethoate	7	✓	✓	✓	✓	✓
Citrophilous Mealybug	aldicarb buprofezin	182 28	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
Citrus Bud Mite	sulfur mancozeb wetttable sulfur	0-1 on some products NA 1	✓ ✓ ✓				
Citrus Butterflies (leafeating caterpillars)	maldison carbaryl	3 3	✓ ✓				
Citrus Flat Mite	abamectin	7	✓				
Citrus Leafeating weevil	bifenthrin	NA	✓				
Citrus Leafminer	diazinon permethrin 40:60 petroleum oil aldicarb paraffin oil	14 NS 1 NA 1	✓ ✓ ✓ ✓ ✓ non bearing trees only ✓	✓			
Citrus Mealybug	buprofezin	28	✓	✓	✓	✓	✓
Citrus Nematode	aldicarb cadusafos	182 NA	✓ ✓	✓	✓		
Citrus Red Mite	abamectine + clofentezine or amitiaz (minor use permit 4515)	NA	✓	Quarantine treatment only for the movement of trees and budwood outside the counties of Northumberland and Cumberland			
Citrus Rust (Maori) Mite	abamectin lime sulfur propineb sulfur wetttable sulfur zineb mancozeb	7 NS 7 0-1 on some products 1 7 NA	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓	✓	✓	
Fruit Flies	maldison	3	✓				
Fullers Rose Weevil	carbaryl	3	✓				
Jassids	buprofezin	28	✓	✓	✓	✓	✓
Leafroller caterpillars	azinphos-methyl	14	✓				

Table 3: Registered products for pest control in citrus (Continued)

Pest	Active Ingredient	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons	Limes
Lightbrown Apple Moth	tebufenozide	1	✓				
	carbaryl	3	✓				
	methomyl	2	✓				
Longtailed Mealybug	parathion-methyl	14	✓				
	aldicarb	182		✓ non trifoliata rootstock	✓ non trifoliata rootstock		
	buprofezin	28	✓	✓	✓	✓	✓
Mediterranean Fruit Fly	dimethoate	7	✓				
Nematodes	fenamiphos	NS	✓				
Orange Fruit Borer	carbaryl	3	✓				
Pink Wax Scale	carbaryl	3	✓				
	maldison	3	✓				
	petroleum oil	1	✓				
	paraffin oil	1	✓				
Purple Scale	maldison	3	✓				
	petroleum oil	1	✓				
Old Fruit Fly	chlorpyrifos + yeast hydrolysate or yeast autolysate	14 (Bait spray only)	✓	✓	✓	✓	✓
	dimethoate (don't use on Meyer lemons, seville oranges, cumquats)	7	✓	✓	✓	✓	✓
	fenthion	7	✓				
Red Scale	azinphos methyl	14	✓				
	buprofezin	28	✓	✓	✓	✓	✓
	chlorpyrifos	14	✓				
	maldison	3	✓				
	methidathion	21	✓				
	paraffin oil	1	✓				
	parathion-methyl	14	✓				
	petroleum oil	1	✓				
Rose Scale	petroleum oil	1	✓				
Rutherglen Bug	maldison	3	✓				
Scale insects	paraffin oil	1	✓				
	parathion-methyl	14		✓	✓	✓	
Small citrus butterfly	parathion-methyl	14	✓				
Snails	copper complex	1	✓				
Soft Brown Scale	azinphos-methyl	14	✓				
	maldison	3	✓				
	petroleum oil	1	✓				
	aldicarb	182		✓ non trifoliata rootstocks only	✓ non trifoliata rootstocks only		
	parathion-methyl	14	✓				
Spined Citrus Bug	carbaryl	3	✓				
	diazinon	14	✓				
	endosulfan (Permit 5974)	14	✓	✓	✓	✓	
	maldison	3	✓				
Stubby Root Nematode	cadusafos	NA	✓				
Thrips	dimethoate	7	✓	✓	✓	✓	
	maldison	3	✓				
Treehoppers	maldison	3	✓				
White Louse Scale	buprofezin	28	✓	✓	✓	✓	✓
	lime Sulfur	NS	✓	✓	✓	✓	
	sulfur	0-1 on some products	✓				
	wettable sulfur	1	✓				

Table 3: Registered products for pest control in citrus (Continued)

Pest	Active Ingredient	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons	Limes
White Wax Scale	azinphos methyl	14	✓				
	carbaryl	3	✓				
	methidathion	21	✓				
	paraffin oil	1	✓				
	petroleum oil	1	✓				
Wingless Grasshopper	chlorpyrifos	14	✓				
	dimethoate	7	✓	✓	✓	✓	✓
Yellow Peach Moth	carbaryl	3	✓				
Yellow Scale	petroleum oil	1	✓				

Table 4: Registered products for disease control in citrus

Disease	Active Constituent in Product	Withholding period (WHP) days	Citrus	Oranges	Mandarins	Lemons
Black Spot	copper sulfate (tribasic)	1	✓			
	copper ammonium acetate	1	✓	✓		
	copper hydroxide	1	✓			
	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
	mancozeb	0-14	✓			
	propineb	7	✓			
	zineb	7	✓			
	copper hydroxide + mancozeb	NA	✓			
	paraffinic oil + benlate	1	✓			
Brown spot	copper oxychloride	1			✓	
	cuprous oxide	1			✓	
Lichens	sulfur	NA	✓			
	wettable sulfur	NA	✓			
Melanose	copper ammonium acetate	1	✓			
	copper oxychloride	1	✓			
	copper hydroxide	1	✓			
	cuprous oxide	1	✓			
	sulfur	NS/0	✓			
	copper sulfate (tribasic)	1	✓		✓	
Moss	sulfur	NA	✓			
	wettable sulfur	NA	✓			
<i>Phytophthora</i> Brown Rot	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
<i>Phytophthora</i> Collar rot	copper oxychloride (OUP NO.48)	1	✓			
	copper hydroxide	1	✓			
	phosphorus acid	0/NA	✓			
	copper sulfate (tribasic)	1	✓			
<i>Phytophthora</i> Stem rot	copper sulfate	1	✓			
Root/Collar Rot	phosphorous acid	NS	✓			
	copper hydroxide	1	✓			
Scab	copper sulfate (tribasic)	1	✓			✓
	copper oxychloride	1	✓			✓
	cuprous oxide	1				
	copper hydroxide	1				✓
	copper ammonium acetate	1	✓			
Septoria Spot	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
Sooty Blotch	copper ammonium acetate	1	✓			
	copper oxychloride	1	✓			
	copper sulfate (tribasic)	1	✓		✓	
	copper hydroxide	1	✓			
	cuprous oxide	1	✓			

NSW Coastal Cittgroup Field Day Report

**Sandra Hardy, Acting
Technical Special Citrus and
NSW Coastal Cittgroup
Coordinator, NSW DPI,
Gosford.**



In late July, two Cittgroup events were held in the Central and North Coast regions of NSW. Research Horticulturists, Graeme Sanderson and Tahir Khurshid from NSW Department of Primary Industries, Dareton gave presentations on their current research projects.

Graeme provided information on various new citrus varieties under evaluation at Dareton. On the Central Coast where fresh citrus juice production is important he also provided information on the results from the recently completed project (CT 98023) on the potential of the Delta and Midnight Valencias and other common oranges for fresh juice production. Results from this project were reported in the Winter edition (No.53) of this newsletter.

Tahir presented the latest results from his work on Ralex® and also introduced growers to the fruit size model available on the ACG website.

Growers from the Central Coast also had the opportunity to inspect the local lemon variety/ rootstock trial and were presented with the final results from this industry funded project.

The following information is based on those presentations.

Ralex® to control flowering in citrus

**Tahir Khurshid, Research Horticulturist, NSW DPI,
Dareton.**

Introduction

Ralex® is a flower suppressant which works by converting flowers into vegetative shoots. It contains gibberellic acid (GA) plus some other compounds and is used to increase the number of

Want Wax?

New LENZ Wash, Wax & Dry Systems

Developed to handle fruit with the most gentle touch, the new LENZ wash, dry, wax and dry citrus and pip fruit to meet your market's expectations for fruit presented to the highest standard, LENZ tailor make to meet your specific requirements. Units for 1.5 tonne/hour start from as low as \$9,000

Also available LENZ electronic sizers and all ancillary equipment.

Langdon Engineering Ltd - New Zealand

Phone (001164) 7 573 0100

www.packhousegear.com



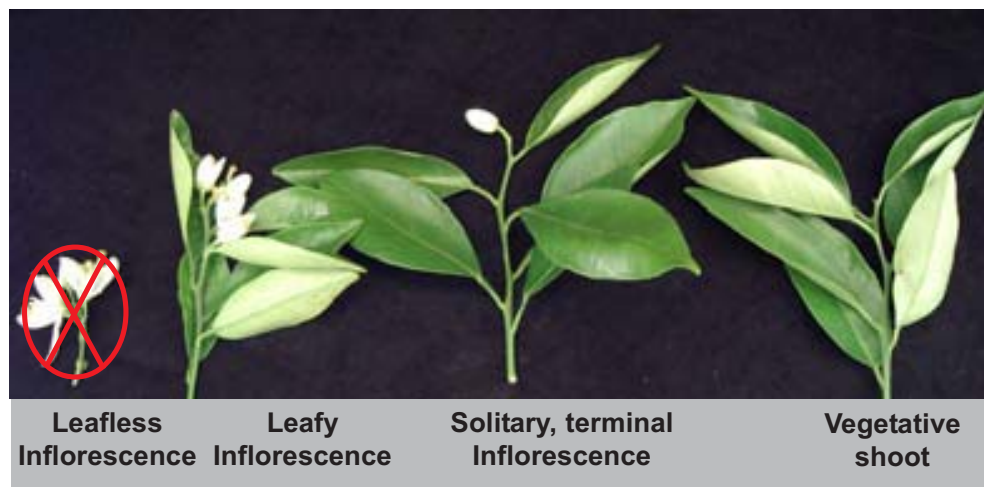


Photo 1: Citrus inflorescence types

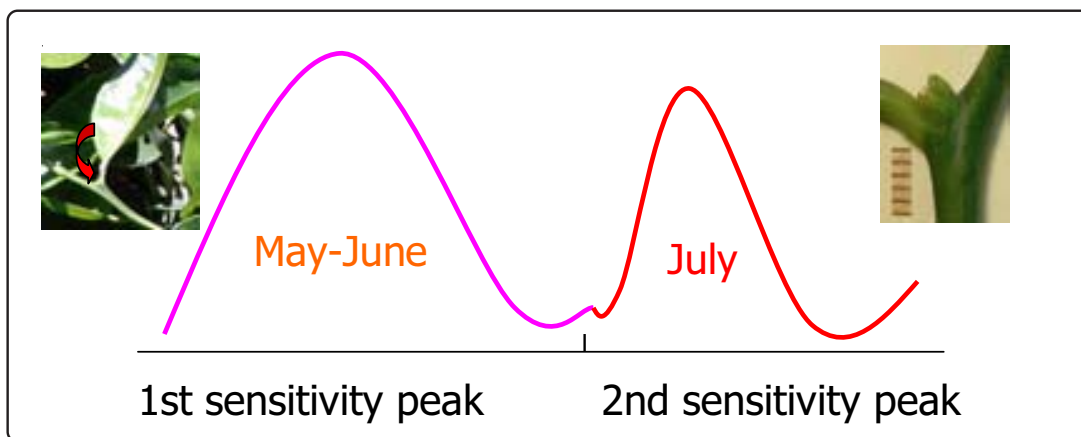


Figure 1: Sensitivity peaks for Ralex application

leafy inflorescences (flowers) and leafy shoots. Ralex® is already registered for use in mandarins to control flowering and trial work is currently underway to assess its use in navel oranges.

There are three main types of inflorescences produced by citrus trees (Photo 1). The 'leafy inflorescence' consists of equal amounts of leaves and flowers and is the optimal one for good fruit set and fruit size. The 'leafless inflorescence' consists mostly of flowers with little or no leaves. The 'solitary inflorescence' produces single terminal flowers.

Based on research overseas there are two main growth periods which are sensitive to the application of Ralex® (Figure 1). The first period is at the flower initiation stage which occurs between early May and mid June. The second more sensitive period is at budburst when the developing buds are about 1mm in length. Unfortunately this second stage is very short, difficult to accurately time and if

targeted with Ralex® could result in a "hit or miss" situation.

Trial Design

In 2003 replicated field trials were established at Dareton trialing different rates and timings of Ralex® applications. The work is being undertaken on 10 year old Navelina and 15 year old Washington navel trees.

Timing of treatments was carried out at five dates in 2003 - on the 6 May, 20 May, 4 June, 18 June and 21 July. Three rates of Ralex® - 100ml, 150ml and 200ml/100L were used. Only a single application of Ralex® was made to trees.

Preliminary Results

Results were assessed using flower counts (in September-October, 2003), fruit counts (in January, 2004) and the final yield (in June-July, 2004). So far the results have shown that Ralex® does significantly suppress the number of flowers

Table 1: Percent reduction in flower numbers using various rates of Ralex®

Ralex® application (ml/100L)	% flowers reduced	
	Navelina	Washington Navel
100	25	27
150	45	32
200	55	39

produced (Table 1). Fruit size also increased, however there were no significant differences between the rates of Ralex® used.

Ralex® did not appear to delay colouring of fruit in the Dareton trials. The cost of Ralex® is \$500 for 5L and trees would need to be sprayed to the point of runoff to achieve good coverage of potential bud sites.

Using information from the trials in 2003, it is estimated that the best application timing will be mid-June using a rate of 150mls/100L Ralex®. This should give the best fruit size at harvest. It is hoped that by using Ralex® annual crop load will be regulated thereby reducing the tendency of trees towards an alternate bearing cycle.

The trial will continue in the 2004 season, but will also include some demonstration trials on properties in the Riverina (2 sites), Sunraysia (3 sites) and Riverland (1 site) areas. Application rates of between 100-150mls of Ralex®/100L were applied to trees in the demonstration trials between 15-20th June 2004.

Fruit Size Production model

Mr Khurshid introduced growers to the fruit size prediction model which is discussed in the *Fruit Size Management Guide Part 2*, sent to citrus growers in the December 2003 issue of the ACN and available as a fact sheet from the ACG website (www.austcitrus.org.au). The fruit size prediction model was developed to allow Australian Navel orange growers to accurately predict final fruit size earlier in the growing season than is currently carried out.

The model allows growers to reliably predict the final fruit size of Washington Navel oranges in early January, after the final fruit drop period when fruit measure about 15-20 millimetres. At this stage growers still have the option to hand thin heavy crops to improve fruit size.

Mr Khurshid said the research showed that all fruit grow at a predicted rate and that fruit that start out small will always end up smaller than fruit that start out big. He advised growers to use the tables as a guide to make the necessary adjustments to management programs.

Variety Evaluation

Graeme Sanderson, Research Horticulturist, NSW Department of Primary Industries, Dareton.

There have been 62 new citrus varieties introduced into Australia since 1986. These new varieties are evaluated at the Dareton Research Station, by being reworked onto mature Valencias grown on both citrange and *P.trifoliata* rootstocks. Commercial crops (the aim is for 100kg of good sized fruit/tree) are obtained within 5 years.

Navels

For navels the greatest demand from Auscitrus recently, has been for Navelina and Fukumoto. Fukumoto is a roundish fruit which is very juicy (45-50% juice) and matures around the same time as Washington navel. However it tends to hold its acid levels and is not as sweet as Washington. It has good potential for export with the acid dropping to acceptable levels during the 6 week shipping time.

Another navel with potential in the novelty/niche market is Ryan. It is an early (April), low acid, easy peel navel, however it is prone to creasing and requires an application of gibberellic acid. Of the mid season orange varieties Atwood and Fisher produced the highest yields at Dareton.

Cara Cara is a pink-red fleshed navel which matures at a similar time to Washington navel. At Dareton it tends to hold its acid but in areas further north acid levels should be lower. The red colour is derived from lycopene a powerful anti-oxidant with proven health benefits.

Mandarins

For mandarins the highest demand from Auscitrus has been for Afourer, Daisy, Nova and Okitsu. Afourer produces big crops of large fruit which can hang on the tree until mid August. It is seedy if not isolated. Daisy tends to be alternate bearing on citrange rootstocks but not on *P. trifoliata*. Daisy is susceptible to brown spot and its use in the USA has declined. Nova is okay but has a tendency to split in some years in dry climates.

Lemon Variety and Rootstock Trial Results

Sandra Hardy, Acting Technical Special Citrus, NSW Department of Primary Industries, Gosford.

Introduction

This research project (HAL Project CT 97005) investigated both potential alternative rootstocks and new varieties. Experiments were established at three sites: Yandilla Park near Renmark, Wingara near Nangiloc and Kulnura near Gosford. This project was undertaken by two research teams, one in South Australia lead by Peter Gallasch and one in New South Wales lead by Sandra Hardy.

At site one, near Renmark, South Australia, the scions Fino and Verna were evaluated in virgin soil on six rootstocks: Sour orange, *P. trifoliata*, Schaub Rough Lemon, Rough Lemon (industry standard), *C.volkameriana* and Benton citrange. Verna and Fino are recently introduced Spanish varieties. This planting was established in 1994.

At sites two and three, near Nangiloc in Victoria (virgin soil) and Gosford in New South Wales (replant soil), the scions Taylor Eureka, Fino and Verna were evaluated on six rootstocks: *C.volkameriana*, Benton citrange, Cox hybrid (3798), Nelspruit hybrid 639 (Cleopatra mandarin x *P. trifoliata*), Fraser hybrid (4017) and Minneola x *P. trifoliata* (1149). These plantings were established in 1997.

Data collected

Yield, fruit quality and tree growth data were collected at all sites. Yield data from Renmark was collected in May 2001, 2002 and 2003 and fruit quality was measured just prior to each harvest.

At Nangiloc yield data for Fino and Eureka was collected in May 2001, 2002 and 2003 and yield data for Verna was collected only in May 2001. Fruit quality assessments were undertaken in 2001 and 2002.

At Gosford yield data was collected in 1999, 2000, 2001, 2002 and 2003. Multiple harvests were undertaken in 1999/2000, 2000/01 and 2001/02 to assess the total annual yield and the spread of crop throughout the year. In 2002 and 2003 only the main winter crop was harvested and recorded. Fruit quality analysis was undertaken on the main winter crop in 2000, 2001, 2002, and 2003. The fruit from

Verna were assessed twice in 2002 and 2003, in July and October 2002 and July and September 2003. Verna is a late maturing variety being harvested 2-3 months after Fino and Eureka. These fruit quality assessments were made at the harvest date of Fino and Eureka and then again when Verna was actually harvested.



Fino on Cox



Eureka on Cox



Verna on Cox

Recommendations

Analysis of all the data from the three sites has resulted in the following recommendations:

- Benton citrange should be considered as a rootstock for both replant and new plantings in all locations.

- Cox produced good quality fruit and the largest fruit overall. It performed well in both virgin and replant soils. It should be further evaluated in a wider range of soil types. It is recommended for use in virgin and replant soils in the Gosford region of NSW.
- Nelspruit hybrid performed well, particularly in the replant soils at Gosford. It could be considered as an alternative rootstock to Benton citrange and Cox at Gosford but is not superior to these two rootstocks.
- *C. volkameriana* performed well producing high yields in virgin soils, but did not do as well in the sandy replant soils at Gosford. It produces fruit with the lowest juice, acid and brix content.
- Fraser performed well in the virgin soils at Nangiloc but was the worst performer in the replant soils at Gosford. It is not recommended for replant sites.
- Fino has a similar cropping habit to Taylor Eureka and tended to produce higher yields. It does have small thorns particularly on older branches and strong vigorous water shoots, however it is not as thorny as Lisbon lemon. Fruit tend to be slightly smaller than those of Eureka lemon. It could be considered for planting in all locations to compliment Taylor Eureka the main Australian variety.
- Verna cannot be recommended for planting unless a specific market niche is identified because of problems with fruit shape. It also is likely to exhibit an alternate bearing habit due to the late maturity of the main winter crop.
- All three varieties produced multiple crops in the temperate coastal climate at Gosford. However only one main winter crop was produced at the two southern sites at Renmark and Nangiloc.

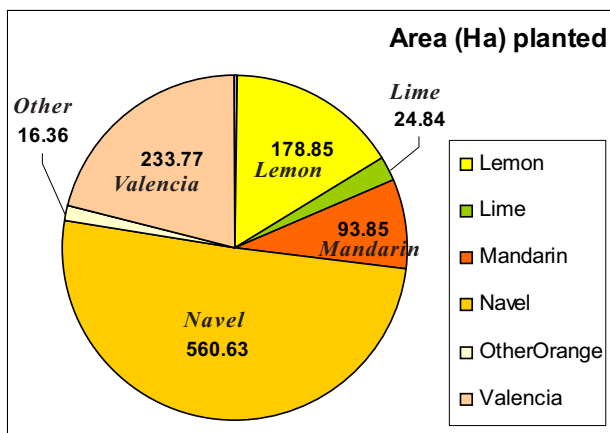
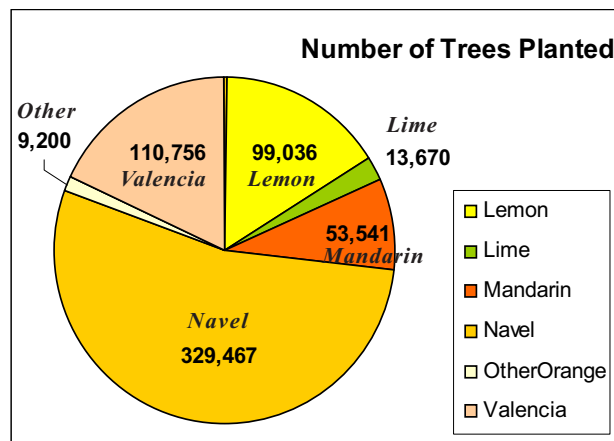
National Citrus Plantings Database – NSW Update

Andrew Thompson, Project Leader - National Plantings Database Project, Australian Citrus Growers.

All NSW Central and North Coast growers have now been sent their individual Crop Plans. Most of the Bourke and Narromine growers have also been sent their Crop Plans. In the Riverina, growers in Griffith have received their Crop Plan, while the growers in Leeton and Hillston should receive their Crop Plans over the next few months.

For the NSW North Coast, Central Coast, Bourke and Narromine, the following two pie charts show the preliminary total area planted to citrus in hectares and also number of trees. Minor categories (e.g. Tangelos, Grapefruit) have been removed from these graphs, or included in other categories (e.g. Blood Oranges included in Other Oranges).

Variety	Area (Ha) planted by Variety
Grapefruit	1.97
Lemon	178.85
Lime	24.84
Mandarin	93.85
Navel oranges	560.63
Other Oranges	16.36
Tangelo	0.51
Valencia oranges	233.77
TOTAL	1110.78



Summerfruit 2004 Conference Report

Suzie Newman, Postharvest Physiologist, NSW Department of Primary Industries, Gosford.

'Sweet Summerfruit Fun and Health' was the theme of the Summerfruit conference held in Melbourne last month. The conference attracted 300 delegates over the 3 day conference.

Day 1 started bright and early with 50 conference participants braving the cold to visit Melbourne Markets. They were rewarded with an informative walking tour of the markets followed by a piping hot breakfast. The first conference session staged at the markets included presentations from Bob Penter (CEO, Melbourne Markets), Mary Stewart (Marketing Director, Melbourne Market Authority) and David Holman (John Holman and Company). The main focus of the session was the role of the markets (including the proposed relocation of Melbourne Markets), retail programs and export market issues. Over the last 12 months Melbourne Markets has seen a 16% increase in buyer registrations

A global perspective on '5+ a day' programs was the feature of Day 2 of the conference. The global scene was painted by speakers from the USA, New Zealand and Australia including the Western Australian program 'Go for 2+5'. Key issues covered by these speakers included: Are '5+ a day' programs effective? What strategies do we use or should we use to promote the health benefits and consumption of fruits and vegetables? How do we measure the success of these programs? Francesc Taccone from the 'Produce for Better Health Foundation' reported that a recent US survey (2003) showed that:

- one fifth of American consumers were eating 5 or more servings per day;
- more than one third were eating 3-4 serves per day;
- more than one third were getting 1-2 serves per day;
- the rest were getting less than one serve or no fruits and vegetables at all.

In New Zealand, Ron Becroft (United Fresh New Zealand) said that 46% of all New Zealanders are now eating 5 or more servings of fresh fruit and vegetables everyday compared with 31% in 1995.

Snippets from advertising campaigns used in the USA and New Zealand were also presented. Promoting the health benefits of fruit and vegetables through '5+ a day' campaigns will continue to have positive spin-offs for the fruit and vegetable industry as consumers become more aware of the health benefits.

Case studies were also presented on a range of social marketing campaigns designed to promote more healthy eating habits including the 'Market Fresh Schools Program', and the 'Colac School Nutrition Program'. These studies demonstrate that targeted programs can change children's eating habits leading to a greater intake of fresh fruits and vegetables. For example, in the 'Fresh Kids' program one of the strategies was to introduce a daily 'Fruit Break' where kids could only eat fruit during this designated snack time. Surveys from two pilot schools have shown that after 3 years, 60% of students continue to bring fruit to class on a daily basis, compared with 17% at the start of the program.

The remaining Symposium sessions on Day 2 focussed on consumer trends and marketing of Summerfruit. David Hughes (Imperial College, London) examined market segmentation and the need to develop products to meet the requirements of each sector. He went on to suggest that when it comes to Summerfruit it may be that we need:

- a budget line for the price obsessed;
- a premium super-sweet variety for the fine food freaks;
- a 'ready-to-eat' snack pack for the convenience junkies;
- point-of-sale promotion reminding all shoppers of the nutritious value of peaches and nectarines;
- a family-pack with 'lunch box' sized fruit for families with kids.

Whatever the case to ensure that we are capturing the different segments of the market we need information on 'who' each of these sectors are.

Lisa Cork (The Marketing Department Ltd) provided an insight into the New Zealand consumer of Californian Summerfruit and described an innovative marketing campaign to promote

Californian Summerfruit to kiwis in the middle of winter. The campaign theme was 'Warm Up Your Winter With California Summer Fruits', and had both a consumer and foodservice focus. Recognising the importance of restaurants in influencing consumer attitudes the Winter Warm-Up Challenge saw chefs taking part in a cook off for the best Summerfruit dish.

The final day of the conference focussed more on technical issues. One of the most popular sessions attracting lots of grower interest was the session on new varieties and access to these varieties. Bruce Topp (QDPIF) provided a stone fruit breeders perspective on where variety development was heading. 1990 to 1996 saw the development of 493 varieties, 66% through private breeding programs and 34% through public breeding programs with 66% being new peach varieties.

As for future trends attention is likely to focus on:

1. novel fruit characteristics including new flesh colours (red, orange), incorporating flavours from other crops (almonds) and the development of seedless fruit and new flesh types;
2. developing a semi-dwarf phenotype; and
3. developing a weeping phenotype.

Water, Soils and Environmental Management Systems (EMS) also featured on the final day of the conference. Henry Schneider (Vic DPI) provided an overview on efficient water use, using the tree growth cycle to illustrate the most effective times to irrigate to promote fruit growth and produce viable budwood for the following season. Charles Thompson (HAL) outlined the HAL water initiative describing it as a platform to:

1. show why horticulture deserves access to water in terms of the economic and social benefits it provides;
2. provide research and tools for further improving the environmental performance of horticulture and
3. make sure horticulture's voice is heard in water policy development.

Delivering 'Ready to Eat' Summerfruit was the theme of one of the afternoon sessions. The project team (Barry McGlasson, Michael Rettke, Suzie Newman and John Golding) presented results from the recently completed HAL project. The aim of this

two year project was to adapt the controlled ripening technology used successfully for peaches and nectarines in California to Australian conditions. The team outlined the ripening process, the response of consumers to 'Ready to Eat' Summerfruit, the use of non-destructive firmness measurements to determine the end point of ripening and the effective storage life of pre-ripened stonefruit.

As with previous Summerfruit conferences, this conference provided a smorgasbord of topics likely to attract the attention of most conference goers. It also provided lots of opportunities for networking with other growers, industry partners and research and extension personnel.



drumMUSTER

Collection Sites and Dates

- ◆ *drumMUSTER* collections are held at the **Hawkesbury Waste Management Facility** by appointment between 8:30am and 3:30pm Mon – Fri. Bookings are essential - Contact Ken O'Brien or Colin Brown on 02 4572 5489.
- ◆ A new *drumMUSTER* site is now open at **LANSVALE**. Collections are held on the last Friday of each month (except December) at Sims Plastics, 21 Day Street, Lansvale. Phone Grace Aragnou on 02 9755 3305 to arrange an appointment.
- ◆ The next *drumMUSTER* collection to be held at **Mangrove Mountain** is scheduled for Saturday 23 October from 10.00am-3.00pm. This will be the last collection for 2004 and also the last opportunity to deliver non-logoed *drumMUSTER* containers.

Users should ensure all your eligible drums:

- *Are cleaned and free of any residue.*
- *Are dry.*
- *Have all lids removed.*
- *Steel containers should be punctured.*

For more information on *drumMUSTER* contact Allan McGann, National Field Officer, Ph: 02 6230 6712 Fax: 02 6230 6713 Mob: 0429409435 Email: dmfield@drummuster.com.au

What's The Future In Soil Fumigation Seminar Report

Bettina Gollnow, Cut Flower Development Officer, NSW Department of Primary Industries, Camden.

What's the future in soil fumigation?

With full methyl bromide (MB) phase out for non-quarantine purposes scheduled for January 2005, flower growers joined strawberry, fruit, turf and vegetable growers at a recent update seminar held in Sydney.

This seminar brought participants the latest on alternative soil fumigation strategies available now and in the future. These include direct chemical replacements for methyl bromide (an ozone depleting chemical), more flexible equipment for delivering steam or chemical fumigants to soil as well as alternative production systems, such as growing crops in media instead of soil and using biofumigant crops.

The event was hosted by Bettina Gollnow and Lawrence Ullio, both extension horticulturists with the NSW Department of Primary Industry, Camden. Fumigation contractors, industry advisors, researchers and representatives of companies developing new fumigants also attended.


The key messages from the array of expert speakers were:

- In some cases, weed control is a more important reason for fumigating than disease control. Some weed seeds and plant pathogen spores are very resilient and can survive various soil disinfestation treatments.
- There are opportunities to use existing fungicides more strategically in disease management. New products under development (biocontrols and biorationals) offer new approaches. For example some products work by making the plant more resistant to disease.
- Growers can achieve a lot by improving their hygiene and excluding diseases from production systems.
- Some growers are able to by-pass the need for fumigants by growing in substrates rather than soil. However, some pathogens transfer to these systems too.
- Since 1995, Australian agriculture has reduced its use of MB by 70% and no industry seems to have suffered adversely as a result. The phase out campaign has stimulated a whole range of technologies and ideas, which meet the challenge of doing it equally well and profitably, without MB. We have gained a great deal of knowledge about how to better control pests, diseases and weeds as a result.
- There are a number of chemical alternatives to MB, including Telone C35®, metham sodium and dazomet (Basamid®). Some give results equally as good as MB but application methods require more finesse. There is no single MB replacement and growers need to make decisions according to what they grow, their local climate and what they need to control as well as cost.
- New chemical fumigants are under development – eg cyanogen, methyl iodide, sodium azide and propylene oxide.
- New methods of chemical delivery to soil are also being developed, for example through irrigation drip lines. However, the relatively small size of the Australian market and the costs (dollars and time) of achieving registration may limit the products marketed here. Telone has taken 6 years to register.
- Keep an eye on the future when there will be more pressure to use non-chemical approaches due to food safety and environmental concerns. Non-chemical approaches to date include steam, solarisation, use of growing media and propane burners for weed control. Some of these approaches are harder to manage, may suit only certain conditions or may give inconsistent results.
- Trial work with methyl iodide, a chemical very similar to MB but without the adverse effect on the ozone layer, shows this chemical has equal or better efficacy than MB. If Australian registration proceeds smoothly, this product will be available in mid 2006.
- Critical to successful fumigation operations are soil preparation, soil type selection, soil moisture, temperature and plant back time. MB

is 'very forgiving' and achieves good results under a range of conditions, but alternatives will only work consistently if conditions are ideal.

- Fumigant users need to be formally trained because of occupational health and safety issues arising from soil fumigation. Access to fumigants is restricted to those who have completed training and obtained a licence from Workcover NSW.
- A major issue for NSW growers is the lack of a local licensed and experienced fumigation contractors. As a result of this there is no local experience with the product Telone C35® which has been adopted interstate as the direct replacement for MB in several industries. It is suitable for field application and for open ended greenhouses.
- There are some encouraging new developments – for example the 'Bioflash' machine from Italy. This machine incorporates hot lime into the soil at the same time as steam and commercial Australian trials of this technology are about to start. This approach allows very fast plant back times (planting in the afternoon of the day of treatment, compared to some chemical fumigants where there may be delays of some weeks after treatment before the next crop can be safely planted). However, its efficacy under Australian conditions needs to be fully tested. In Europe it has proven effective in greenhouses, especially for nematode control, and already Queensland trials have shown it is very effective in killing nut grass, a particularly persistent weed.
- In less than 10 years, the national strategy for MB phase out has achieved a great deal. Fifty trials have been conducted around Australia, new products have been developed and in some cases registered, alternative methods tested and new machinery developed. There have been information 'roadshows' and networks have been set up to communicate research and policy to growers and others. Twelve editions of the 'MB update' newsletter have been published. Australia has been represented at many international MB conventions and the Australian program gets a lot of praise internationally for its achievements.
- A brand new booklet has just been released for growers, called 'Getting the most from methyl bromide alternatives' (free copies are available

for growers and the book is also published on the web at www.dpi.vic.gov.au/farming/horticulture/mb). Areas covered include the background to MB phase out, knowing your pests, non chemical and chemical alternatives to MB, soil preparation, weather conditions during fumigation, application techniques, including methods of sealing fumigants in soils and management of fumigant residues. Many photos and diagrams support the information, and critical actions are clearly highlighted.

Growers wishing to receive an information package including notes from the seminar and a copy of the booklet should contact Bettina Gollnow or Lawrence Ullio at NSW Department of Primary Industry, PMB 8, Camden 2570, phone 02 4640 6333, fax 02 4640 6300. 

News in Brief

- ◆ **QFVG has changed its name to Growcom**



Queensland Fruit & Vegetable Growers have changed their name to reflect the expanded range of work they do. While Queensland's fruit and vegetable producers remain the focus of their business, they also provide a suite of commercial and consulting services to other businesses within the horticulture industry, and outside Queensland.

For more information call 0732 132 444 or go to www.growcom.com.au.

- ◆ **New "Outbreak" Website**

A new website to keep Australians and trading partners better informed in the event of a future pest or disease emergency.

The site will provide specific information for producers, travellers, non-English speakers and details for media. It features a subscription list for those who want to be kept in the know as information becomes available. View the website online at: www.outbreak.gov.au

Green Tea Field Day at Kulnura

John Golding, Postharvest Physiologist, NSW Department of Primary Industries, Gosford.

Over 30 people attended a recent Green Tea Field Day held in early September at 'Paradise Plants' nursery at Kulnura. Talks and demonstrations of green tea production on the Central Coast were given to potential growers. Mr. Nakamura, President of the Japanese Green Tea Company *Kunitaro*, outlined the aims for the local industry and presented updated costs and expected returns of green tea on the plateau. The Field Day also included a tour of the Mangrove Mountain property that has been bought by *Kunitaro* for the establishment of a demonstration and production farm for high quality green tea production. *Kunitaro* has also appointed a manager to oversee the development of the farm. This is a significant development for the project which ensures *Kunitaro's* commitment to the local Green Tea industry. *Kunitaro* are now looking for potential growers on the Central Coast interested in Green Tea production.



Vong Nguyen and Nakamura Kunitaro present information at the field day.

Production details of Green Tea on the Central Coast were outlined by Mr. Nakamura, where the costs of inputs (compost, fertilisers, irrigation, plants) and returns were discussed. The planting density is approximately 23,000 tea plants per ha and the first commercial harvest is expected in the third year. A guaranteed price is assured but a premium will be paid on quality. Mr Nakamura expects that a positive dollar return will occur by the fourth year of production.

There are three harvests of green tea per year (October, November / December and January). However the first harvest is the most important, producing the highest quality and it will bring the best price premium. 'Kunitaro' will have specialised equipment for planting and harvest which will be available for rental. This equipment is specially designed to minimise labour. More detailed production information is available from 'Kunitaro'.



Prepared beds ready for planting in early spring.

A Green Tea Research and development project has also started at Gosford Horticultural Institute. This project is being supported by the Rural Industries Research and Development Corporation (RIRDC), *Kunitaro*, NSW DPI and the University of Newcastle. It is planned to research local production and processing issues to optimise green tea yield and quality on the NSW Central Coast. Research at the NSW DPI Somersby and Narara sites has commenced.

This project will provide information and technology to allow a sound basis for the production of high quality green tea in Australia. This will involve both pre- and postharvest management factors such as varietal selection, propagation, nutrition, bush management and organic production to produce high quality green tea. The project leader for this work is Dr. Vong Nguyen at the Gosford Horticultural Institute, NSW DPI.

Interested growers should contact Vong Nguyen at Gosford Horticultural Institute, NSW DPI (Telephone 4348 1900).

Websites

◆ **A more user-friendly APVMA Website**

The new look home page, www.apvma.gov.au, now has three new entry points – for the 'community', 'chemical industry' and 'chemical users'. The chemical users page has links to pages on chemical safety, disposal of containers and buying and using chemicals. The page for the chemical industry is concerned more with registration and regulatory issues.

The second type of entry is the search options. **Search the site** takes users to our site search engine. **Search for a product** takes users to the PubCris database - a one-stop shop for all currently registered products with options for searching by product, active, host, crop, pest (or combinations of these) and a link across to copies of most product labels and other regulatory information. **Search for a permit** takes users to our database of all issued permits with links to the full text of the permit.

What's new in publications

◆ **Australian Weed Management**

The CRC for Australian Weed Management has produced a series of 6-8 page colour brochures covering the 20 Weeds of National Significance. The guides are available at www.weeds.crc.org.au/publications/weed_man_guides.html

◆ **Lantana Control Manual**

The Lantana Weeds of National Significance project has published a current practice manual for lantana, explaining various control methods and options available in different land-use situations. The 88 page colour manual is available for \$11.95 from Natural Resources Mines and Energy in Qld. Go to www.nrm.qld.gov.au/pests/wons/lantana or phone 07 3896 3224.

◆ **Improving profit for the flower grower - A study using benchmarking.**

Full report (250k) available at www.rirdc.gov.au/reports/WNP/04-119.pdf

New Agfacts on the web

- ◆ **Boron deficiency in pome fruits**
www.agric.nsw.gov.au/reader/pome-pests-diseases/h4-ac-2.pdf
- ◆ **Bitter Pit in Apples**
www.agric.nsw.gov.au/reader/pome-pests-diseases/h4-ac-1.pdf
- ◆ **Cherry growing in NSW**
www.agric.nsw.gov.au/reader/stone-fruit/h5-1-2.pdf
- ◆ **Catalogue of all Agfacts on the web**
www.agric.nsw.gov.au/reader/pub-series/pub-agfacts.htm
- ◆ **Getting the most from methyl bromide alternatives.**

A guide to soil disinfestation strategies in the absence of methy bromide, 2004, 24 pages.

For information phone Natalie Tostovrsnik (Methyl Bromide Communication Officer) on 0392 109 222.

What's on

◆ **19-21 October 2004 Australian National Field Days, Orange.**

For information phone (02) 6362 1558 or go to www.anfd.com.au



◆ **Horticultural Field Day**

The Australian National Field Days (ANFD) are organising a dedicated Horticulture Field Day to be held on 9 February 2005. The event will be conducted at the Sunny Crest Orchard of Ken Perry in Wallace Lane, off Pinnacle Road, with commercial exhibits, product demonstrations and talks to provide orchardists with a look at the latest technologies.

For more information contact Fiona Hall or David Lamrock, Australian National Field Days, PO Box 2150 Orange NSW 2800. Ph: 02 6362 1588; Fax: 02 6362 5421 or Email: info@anfd.com.au

Print Post Approved
PP255003/00759



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.

SURFACE
MAIL


NEW DEPARTMENT OF
PRIMARY INDUSTRIES
POSTAGE
PAID
AUSTRALIA

NSW Department of Primary Industries Staff - Who to Contact For Commercial Fruit Enquiries

Alstonville 02 6628 0604

Phillip Wilk - District Horticulturist

Camden 02 46 406408

Lawrence Ullio - District Horticulturist
Mobile 0412- 436 871

Gosford 02 4348 1900

Sandra Hardy - District Horticulturist
Mobile 0412 - 425 730

Maitland - 02 4939 8888

Tony Somers - District Horticulturist
Michael Cashen - WaterWise Officer
Genevieve Lennard - Agricultural Inspector

Windsor 02 4577 0600

Peter Malcolm - District Horticulturist
Bill Yiasoumi - Irrigation Officer
Matt Plunkett - WaterWise Officer
Rob Bowman - Senior Inspector
(Sydney & South Coast) 04111 39579

ALWAYS READ THE LABEL

Users of agricultural chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Editor-Sandra Hardy
NSW Department of Primary
Industries
HRAS Locked Bag 26
Gosford NSW 2250
Ph: 02 4348 1900
Fax: 02 4348 1910
email: sandra.hardy@agric.nsw.gov.au