

# COASTAL FRUITGROWERS' NEWSLETTER

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## No. 42 Spring 2001

**Dear Growers,**

Welcome to another Spring edition of the newsletter.

Well, the weather is finally warming up and soon there'll be fresh stonefruit in the shops.

In this issue there's a number of presentations from recent conferences and field days. There's also lots of short updates in the News in Brief section.

At the time of going to press there was still no news on the National Registration permit for control of carpophilus beetles in stonefruit for this season. As soon as information is available NSW Agriculture and the AFSFGA will notify industry groups.

Bye for now.

*Sandra Hardy*

### UPCOMING FRESHCARE COURSE

Joseph Ekman (NSWA) is planning to run a 1 day Freshcare course for horticultural producers at Sydney Markets in the next 2 months. If you would like to attend please contact Joe on 02 4348 1922

### Orchard Equipment for Sale

Enviromist dome herbicide sprayer for use with quadbike. 1m diameter dome. As new condition \$600

Hardi p500-4 PTO pump, 2 x 120 litre plastic drums, 25m pressure hose, Brass hand wand with herbicide shield. Used on tractor carryall.

Good working order \$400

Contact Jim Simpson 4355 1332



NSW Agriculture

Fruitgrowers' Newsletter  
Edited by Sandra Hardy  
Design & Layout - Ann Boesen

*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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# Report on the heat unit mapping project

## HRDC Project CT 98016 Heat Unit Mapping as an aid to the selection and evaluation of citrus cultivars

*Ron Hutton, Senior Research Horticulturist, NSW Agriculture, Yanco*

### Industry Summary

*Satellite prospecting is set to deliver the sweetest, juiciest citrus fruit to tomorrow's consumer.*

As the Australian Citrus Industry rises to the challenges of profitable, sustainable and globally competitive agribusiness it is important to keep its sights focused on the future.

Many citrus growers and the regional communities in which they live are facing unprecedented change. While this creates immense challenges for the production sector it also creates opportunities, since the move toward global marketing demands a globally competitive Australian industry.

The success of farmers and food processors are inextricably linked in meeting changing demands of consumers in a volatile world market and in sustaining growth and profitability.

The key strategy driving the structural adjustment facing the citrus industry depends on increasing market access for export fruit.

NSW Agriculture designed the heat unit mapping project as an aid to selection and evaluation of citrus cultivars to help growers and investors in Australia's largest fruit industry make those all-important planting decisions that will take the industry forward.

Detailed georeferenced mapping on a continental scale has been used to find new areas with potential to grow citrus successfully. Citrus, like any crop, thrives best when there is sufficient water in an ideal soil type and climate. However, each citrus variety has its own specific requirements despite being able to grow in a range of environments to supply markets over an extended period.

Currently, growers largely rely on local experience plus any available information about new varieties, as well as juggling other factors such as seasonal market requirements and supply of harvest labour. Now, a more scientific approach is available to help find new varieties suitable for traditional production regions, or to identify new regions for citrus pioneers to investigate.

This innovative R&D project has developed a methodology to predict growing degree-days (GDD) with a synthetically generated average growing season derived from long term climatic data.

This was applied to a GIS package (Arcview/Spatial Analyst) in order that special conditions of climate, topography, soil type, water availability and infrastructural requirements for citrus growing could be analysed simultaneously.


The heat unit mapping strategy is based on the strong relationship between maturation of citrus fruit and degree-days (net heat accumulations) evidenced by the large spread in time for oranges to reach market maturity in various climatic situations around the world.

For the first time, detailed satellite mapping has matched climate records, soil type and water supply to create a prospecting tool for growers looking to plant sought-after new varieties. Citrus fruit comes in many different types, each of which responds differently to different climates.

The project has identified regions of Australia suited to cool climate, warm climate and hot climate citrus growing using a combination of the synthetically produced environmental predictors with GIS referenced overlays of water resources, soil suitability index, potential evapotranspiration (water use), river systems, population centres (towns), annual average rainfall maps, and transport routes.

The key steps in developing this new decision support system were:

- Develop daily spatial heat unit mapping capability from monthly climatic surfaces for the Australian continent.
- Generate georeferenced (GIS) climatic stratification maps for existing and potentially new citrus producing areas based on annual GDD sums (Effective Heat Units).
- Produce major spatial products as tools for use by the citrus industry to identify the start day of the growing season, calculate GDD for a growing season of defined duration, and determine the time required to accumulate a predetermined GDD requirement, say 2000 GDD, from the estimated starting day.
- Develop detailed physical mapping of soil and water resources which can be matched to specific locations for achieving optimum citrus yield and fruit quality outcomes.
- Develop a soil suitability index classified on a 1- 5 scale as a composite of 5 layers (Depth to impeding layer, Gross nutrient status, Drainage, Water storage and pH) and mapped at a 1 kilometre grid scale.

Used in conjunction with the modelled climatic GIS overlays, these tools can assist in providing a geo-referenced varietal performance matrix. This will allow prediction of where like varieties should perform equally well, either in terms of maturity period or where particular quality requirements need to be met for a particular market. For more information, contact: Ron Hutton, *Senior Research Horticulturist, YANCO Agricultural Institute, Private Mail Bag, YANCO NSW 2703*. Ph (02) 6951 2727 or email: Ron.hutton@agric.nsw.gov.au  
Copies of the full report can be purchased from Horticulture Australia. Phone 02 8295 2300. 

## NSW Nursery Industry News

Following the repeal of the Horticultural Stock and Nurseries Act in December 2000, the NSW nursery industry now has the opportunity of continuing to fund research and development projects.

The Agricultural Industries Services Act 1998 allows for the establishment of industry committees to provide industry services funded by a compulsory charge. Industry services can include research and development, market intelligence and quality assurance schemes, educational activities, pest and disease control, and the management of compensation schemes.

### How was the NSW Nursery Industry Services Committee created?

The NSW Nursery Industry Services (NNIS) Committee was created by a regulation - the Agricultural Industry Services (Nursery Industry Services Committee) Regulation 2001 - made under the Agricultural Industries Services Act 1998.

### What services can the NNIS Committee provide?


The services relating to the growing of nursery stock for which the NNIS Committee has been created are:

- supporting research into the development of schemes and techniques for production efficiency, environmental protection and business management
- promoting such schemes and techniques to growers
- providing education and training in such schemes and techniques and other matters.

### How are the services funded?

The services will be funded through a compulsory charge on industry members, but only after industry members vote for a charge and vote for the level of charge

### How do I obtain more information on the Committee?

- <http://www.agric.nsw.gov.au/reader/nisc>
- Committee members: Robert Lee, Stuart Swaddling and Ralph Groves C/- Nursery & Garden Industry, NSW & ACT 344-348 Annangrove Road, (PO Box 3013) Rouse Hill NSW 2155
- Phone 02 9679 1472 Fax 02 9679 1655 



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# DARLING RIVER NURSERY

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# Bacterial spot of Stonefruit - methods of control

*Extracted from the Proceedings of the Australian Fresh Stone Fruit Growers 7th National Conference, Hobart 2001.*

Although bacterial spot is a problem in many stonefruit growing areas in the world, no-one has yet been able to develop an effective method to totally control this disease. The difficulties in trying to control this disease are demonstrated by the observation that over 50,000,000 of the bacteria causing bacterial spot (*Xanthomonas campestris* pv. *pruni*) can often be found in one canker.

This article presents data on how growers can reduce bacterial spot in their orchards.

## 1. Choice of stonefruit variety

Should your orchard be in an area susceptible to bacterial spot (i.e. the environment is humid, or moist and warm during the growing season), less susceptible varieties should be chosen when possible.

## 2. Choice of planting site

Susceptible stonefruit varieties should where possible, be planted into:

a) *Sheltered sites where wind damage is minimal* (but air movement is enough to prevent frost damage and relatively rapid drying of the tree). Prevention of any physical damage to the tree is important in reducing bacterial spot infection. For example, hail damage often acts as a precursor to bacterial spot infection. Shelter may be provided naturally, or through hail netting or wind breaks.

b) *Heavier, rather than sandy soils.* Reports in both Australia and overseas have observed that bacterial spot is more severe on sandy soils, compared to loam or heavier soils (except where the heaviness of the soil induces soil flooding).

c) *Sites, surrounded by resistant stonefruit varieties.* Susceptible trees should be planted in blocks adjacent to resistant varieties. This will minimise the possibility of bacterial spot spreading from infected trees to these newly planted trees.

## 3. Examination of nursery trees


On receiving trees from a nursery it is important to inspect them for cankers. Infected nursery trees have been reported to be a means of spread of this disease in South Africa.

## 4. Chemical applications

Copper should be applied at least 3 times during leaf fall (to prevent leaf scar infection), once during winter, at budburst and then 7-10 days later. Of 12 chemical treatments evaluated, copper was the most effective treatment in reducing the percentage of developing buds infected by *Xc.pruni*, after being sprayed onto the surface of infected buds.

In glasshouse trials, application of copper at budburst, rather than when the buds are dormant, was more effective at reducing the percentage of buds infected by *Xc.pruni*.

## 6. Fertility

Bacterial spot development should be minimised by maintaining adequate fertility in order to avoid excessive foliar growth or weakening of trees from poor nutrition. 

## Royal Zoological Society - Flying Fox Forum Report

*John Rogers*

*Extracted from the "NSW North Coast Stone Fruit Grower" September 2001*


You would be aware that the grey-headed flying fox has been listed as threatened under the NSW *Threatened Species Act*. If the usual policy path were followed this listing would effectively stop the NPWS from issuing licenses to shoot flying foxes.

However, as this would have serious commercial and social consequences for the fruit industry, the NPWS asked the Royal Zoological Society of NSW to convene a forum to look at options for managing flying foxes in the future. The forum was held on 28 July and attended by representatives from the NPWS, NSW Agriculture, research scientists, and environmental groups.

NSW fruit producers were represented by four commercial fruit growers, including John Rogers and John Gough Snr, who presented papers on the commercial impact of flying fox predation and the options for management.

There were two important outcomes from this forum:

(1) A consultative committee of principal stakeholders is to be formed. The Committee will have about a dozen representatives, including three from the farming community nominated by the NSW Farmers' Association and one nominated by the banana industry. Robin Amos, a lychee grower from our area, is one of the representatives nominated by NSW Farmers. Its first meeting is on 24 August. Included in its business are such matters as research requirements and sources, the social and economic costs of predation, environmental strategies to reduce predation, non-lethal means of deterrence, and incentives for netting.

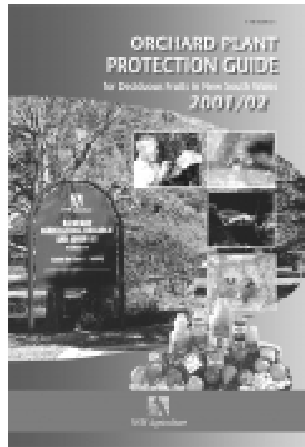
(2) NPWS is prepared to continue to allow licensed shooting for the next three years (that is, if legal actions by environmentalists don't prevent it), and will work with industry to develop property management plans which will obviate the need for licenses to be issued seasonally. 



# News in Brief

## 2001/02 Orchard Plant Protection Guide - available NOW

John Slack



NSW Agriculture has released the 11<sup>th</sup> edition of the Orchard Plant Protection Guide for Deciduous Fruits in NSW 2001/02. This edition breaks new ground with an introduction to organic farming, which is the subject of one of our feature articles. Another first is that the Guide will be available on NSW Agriculture's Website.

The Centre for Organic Farming is now located at the Bathurst Agricultural Research and Advisory Station. Because of this, future editions of the Guide will include more advice on alternative pest and disease control options. All growers are actively encouraged to adopt sustainable management practices into their farming system.

The Guide has been fully reviewed. New sections have been added on biological control, protecting orchards from flying foxes, control of superficial scald in pome fruit, weed management and crop regulation in deciduous fruits. The content of the Guide has been rearranged. The pest and disease management section has been relocated towards the front of the publication and retains many useful reference articles. Once again, agricultural chemical companies have provided information on their products and helpful suggestions.

Thanks go to the officers of NSW Agriculture and other organisations who have helped to revise this issue of the Guide. It is hoped that these articles and the Guide in general will continue to provide useful and practical information.

The valued financial support of the advertisers is acknowledged and appreciated. Without their support this Guide would not be available free to all commercial deciduous fruit growers throughout New South Wales. Copies of the new Guide are available from your local District Horticulturist.

## NSW Stonefruit Growers Report

Rowan Berecny, *President NSW Stonefruit Growers*

### Flying Foxes

A well attended flying fox symposium held on 28<sup>th</sup> July has seen the formation of a NSW Flying Fox Consultative Committee to determine future management policy of

the grey headed flying fox. The committee is to be headed by NSW National Parks & Wildlife Service with representation from fruit growing industries, ecologists and local government. The fruit industry is being represented by Peter Comensoli – a stonefruit grower from Mangrove Mountain, Robyn Amos – a lychee grower from Byron Bay, Michael Lines-Kelly – CEO-Banana Industry Committee, and Kate Donald – NSW Farmers.

The committee had its first meeting on 24<sup>th</sup> August. National Parks & Wildlife Service has stipulated that the culling of grey headed flying foxes will be phased out over 3 years. The final structure of the license for the 2001-2002 season has yet to be determined. A fee of \$30 will apply to any licenses issued. Grower and regional quotas will be set. Growers are urged not to cull without a license.

### Levy

Following a decision taken at the Hobart annual general meeting of the Australian Stonefruit Growers Association, a review of the current stonefruit levy will be made to determine whether it meets the needs of the industry with regards to research, development and promotion for the years from 2002/2003 and beyond. All growers will be given the opportunity to vote on the issue before any decision is made at the 2002 conference.

## New Deciduous Fruit Plant Pathologist appointed

Shane Hetherington has started work as NSW Agriculture's deciduous fruit pathologist at the Orange Agricultural Institute. Prior to taking up this appointment he worked for six years with NSW Agriculture developing fungal biological control agents for use against weeds in wheat and rice cultivation. He studied plant pathology at the University of Queensland and during his PhD studies did a lot of work around the Grafton and Coffs Harbour areas searching for biocontrol agents for Parramatta Grass. He has also worked on controlling diseases on plants using naturally occurring yeasts and bacteria.

In his new role Shane intends offering a diagnostic service to growers through the Department's Plant Health Diagnostic Services (PHDS) and running a research laboratory. The research conducted at Orange will initially survey apple scab in NSW for DMI fungicide resistance. It is important that any research done at OAI aims to solve problems most relevant to growers in the pome and stone fruit industries. Shane would like to talk to growers about any disease issues they think should receive more research attention. He can be contacted at the Orange Agricultural Institute, Forest Road Orange, 2800; by phoning 6391 3860 or by e-mailing [shane.hetherington@agric.nsw.gov.au](mailto:shane.hetherington@agric.nsw.gov.au).



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## Citrus Breeding & evaluation workshop report

Pat Barkley, Auscitrus

A well attended meeting of growers, research and extension staff, was held on 23 August, 2001 at the Agricultural Research and Advisory Station at Dareton, with presentations and discussion related to issues of citrus improvement. The following papers were presented:

- A commercial approach to new varieties: *J. Chavarria*  
ABL Report on Citrus Export Markets: where to now? *G. McEvilly*  
Summary of scion evaluation research: where we are at and where we are going: *G. Sanderson*  
Regional evaluation model: *K. Bevington*
- Can heat unit accumulation data be used to determine where to plant new varieties? *R. Hutton*
- Satsuma trial in Riverina and varietal evaluations in NW NSW: *L. Revelant*  
Scion and rootstock evaluation in New Zealand: *A. Currie*  
Importing the management techniques, as well as the variety: *S. Falivene* – growing satsumas in Japan.  
Factors influencing seedlessness; cross pollination ability of *Citrus* species; pollen dispersal and orchard design: *S. Sykes*
- Topworking trials on grower properties: their value in providing information to growers on new varieties: *K. Thiel*
- Role of National Citrus Industry Improvement Manager and citrus variety access: *P. Barkley*  
Variety fact sheets: *M. Smith*  
Auscitrus Report: *P. Florissen*

The meeting included an inspection of scion and rootstock evaluation trials at Dareton and a discussion of the role of IDO's and CITTGROUP co-ordinators in varietal and rootstock improvement.


Papers or overheads of the papers given at the meeting have been collated into a booklet, which will be available from Nathalie Jarosz (Communications Officer) at the offices of the Australian Citrus Growers', Level 1, 51 Deakin St., Mildura 3500 (phone 03 50 236333).

## Plant Health Australia review diagnostic capability to enhance emergency response and trade

Plant Health Australia (PHA) today announced it had commissioned the Department of Natural Resources and Environment - Victoria (DNRE) to review Australia's plant pest and disease diagnostic capability.

The aim of this research project is to document the existing government and non-government diagnostic laboratories, diagnostic staff and skills, and resources dedicated to diagnostics in the plant sector.

PHA's major role is working with industry and government members to develop policies that enhance the ability of the Australian agricultural sector to effectively respond to and manage the risks of pests, diseases and weeds.

This project will identify impediments to efficient use of resources, and put forward a series of recommendations that will help PHA develop a diagnostic network. The network will span both public and private diagnostic providers, and help ensure Australia has the capability to diagnose existing and new plant health threats. 

## Irrigation Code of Practice

Norm Cross Irrigation Officer NSW Agriculture Tocal


The "Australian Code of Practice for On-farm Irrigation" and its companion, the "Australian Code of Practice for On-farm Irrigation: Expanded edition for Service Providers", were developed following a series of workshops at which people from various sectors of the irrigation industry made recommendations for their content.

The general code for irrigators provides guidelines on developing a new irrigation system or upgrading an existing one. It makes recommendations for planning, design, installation, commissioning, operation and maintenance of irrigation systems.

The publication for the service industry lists irrigation standards and codes applying to sections of this code. It was prepared in a global search for standards on all aspects of on-farm irrigation and it provides references for irrigation engineering practice and product performance.

The main aim of the guidelines is to encourage more efficient and cost-effective use of irrigation resources and is therefore a reference document of how irrigators view best practice, in a generic form. It is purely advisory and does not imply any legal status.

The development of these codes were funded by The Murray Darling Basin Commission (MDBC) with additional support from the Irrigation Association of Australia (IAA) and NSW Agriculture.

Copies of the general edition are available free-of-charge from Jeremy Cape, National Irrigation Science Coordinator, phone (08) 8303 8552, or E-mail [nisn@adl.clw.csiro.au](mailto:nisn@adl.clw.csiro.au) 

## News in Brief

### Expert appointed to head study on citrus industry's future

NSW Agriculture has appointed strategic planning and business development expert, John Larkin, managing director of Auroa Practical Solutions, Dubbo, to head the Citrus Development Strategy Feasibility Study. The study will develop a strategic plan for sustainable development in the NSW and Australian citrus industries.

The project is jointly funded by NSW Agriculture, NSW Department of State and Regional Development, the Federal Department of Employment, Small Business and Workplace Relations and the citrus industry.

The focus will be on revitalisation of southern citrus growing areas and the potential for these regions to work with new and existing citrus areas in the central and northern parts of NSW. Mr Larkin is currently meeting with citrus industry representatives and will work closely with industry and citrus growers throughout the study.

A steering committee of industry representatives from southern NSW, central-west and north-west NSW and government representatives will manage the project.

The final report from the Citrus Development Strategy Feasibility Study will be a Business Plan including financial analysis and logistics for the future development of fresh fruit and processing strategies for the citrus industry. A draft for industry discussion will be available early in 2002. 🍇

Check out NSW Agriculture's horticulture web site on:

[www.agric.nsw.gov.au/reader/14](http://www.agric.nsw.gov.au/reader/14)

...where you'll find information on all sorts of crops and copies of new and updated agfacts.



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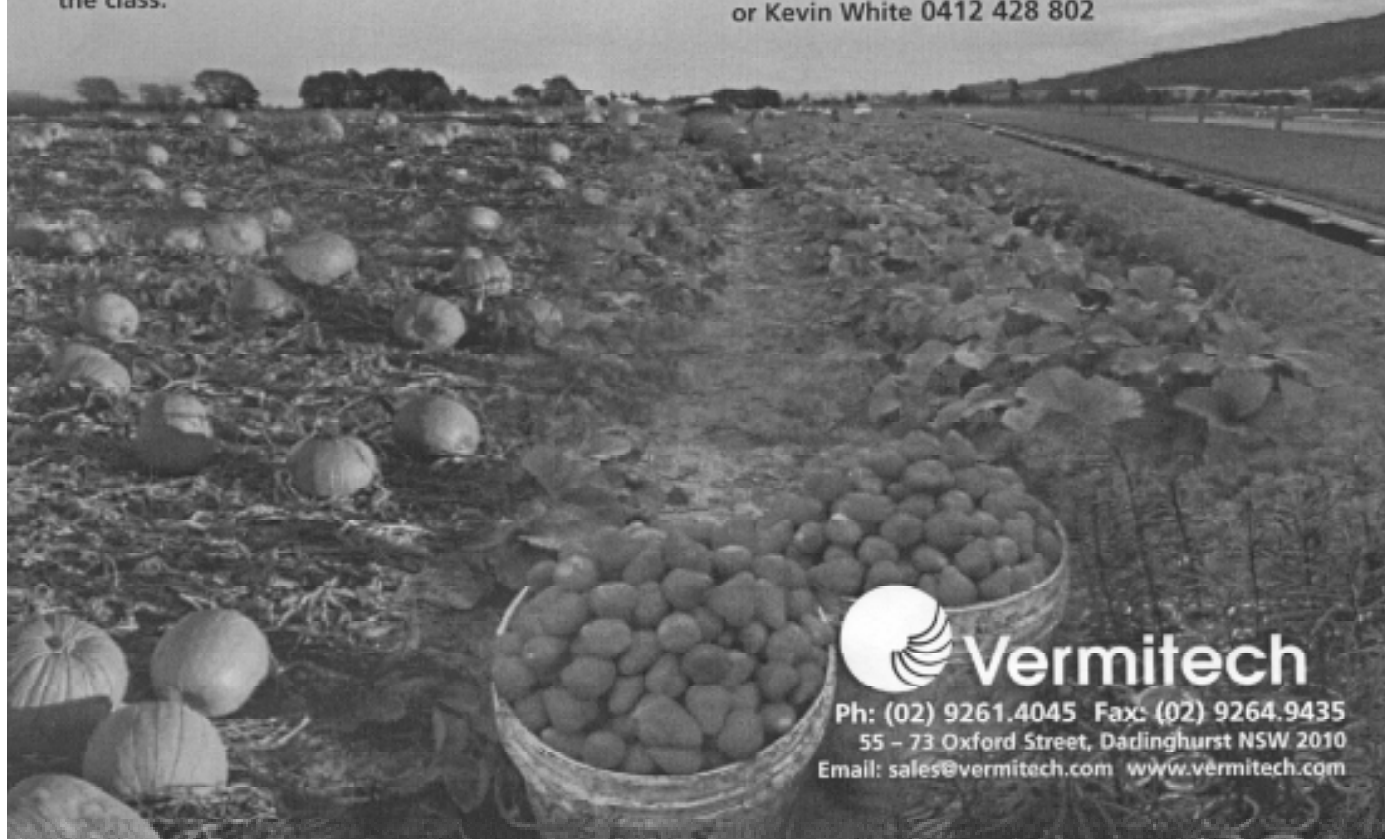
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# News in Brief

## Australian Horticulture R & D Program Update



Horticulture Australia

In May 2001 the AusHort (Cross horticultural industry) R&D Committee met to review the current AusHort R&D program and to develop the new 2001/02 program. Below is an outline of some of the key meeting outcomes and an updated list of current projects.

An update was provided on the project 'Improved labeling of pesticides to encourage optimum use in horticultural crops'. The purpose of this project was to investigate the anecdotal evidence of industry concerns with pesticide labels. Pressures from market requirements and regulatory bodies mean that producers need to use pesticides in the most effective way requiring the label to better serve this purpose. This project has quantified the problems of growers with pesticide labels and made recommendations to improve the labels

The AusHort R&D Committee decided to set up an industry working group to consider the project recommendations. This will include representation from tree crops, vegetable crops, the nursery industry, Avcare and Horticulture Australia to consider the feedback from industries as contained in the report.

Kevin Bodnaruk of AKC Consulting Pty Ltd provided an update on the activities and achievements of the project he is conducting to provide a coordinated response from horticulture to the National Registration Authority (NRA) Existing Chemical Review Program (ECRP).

The chemicals currently under review include Diazinon, Chlorpyrifos, Azinphos methyl, Aldicarb, Fenthion, Dichlorvos, Fenitrothion, Endosulfan and Dimethoate.

A large part of the project supports communication with industry associations and Industry Development Officers, who relay the information to growers through association newsletters and industry media.

AusHort investment will continue in these areas for the next three years.

Dan Ryan of Horticulture Australia provided an update on the current AusHort investment in fruit fly and new program recommendations. At a recent industry workshop it was recommended that future investment be targeted in the following four areas:

1. Use of micro-satellite tracking to determine the source of Qfly outbreaks in the Fruit Fly Exclusion Zone
2. Analysis of movement of Queensland fruit fly in the fruit fly exclusion zone

3. Data collection on dispersion of fruit flies in South Australia

4. Area-wide management of fruit fly in endemic areas - a feasibility study

These projects are currently in the process of being commissioned.

The AusHort R&D Committee has also decided to commission the development of a communication strategy for the program. This has involved a literature search of existing industry communication plans, a workshop and survey of Industry Development Officers. The aim is to ensure that existing industry communication channels are used as efficiently as possible so that information on the program is effectively communicated and input received.



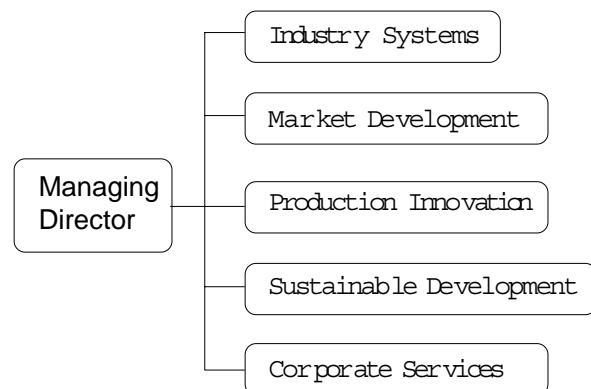
## Horticulture Australia Update

*extracted from R & D horti-bits Aug/Sep 2001*

### Changing Our Structure

Horticulture Australia has been undergoing some changes in our staff organisational structure. The new structure provides integrated R&D and marketing services to best meet industry requirements and maintain Australian horticulture's competitive position.

A cross-functional approach has been taken for the new structure as shown in the simplified diagram below. This diagram indicates the 5 teams that make Horticulture Australia, lead by Team Leaders and ultimately by the Managing Director.



### Our contact details are as follows:

Level 1, 50 Carrington Street, Sydney NSW 2000

Tel: 02 8295 2300; Fax: 02 8295 2399

Email: horticulture@horticulture.com.au

Website: www.horticulture.com.au



# Don't go "cold" on effective chilling

*Extracted from the NSW North Coast Stonefruit Grower, September, 2001.*

*Phillip Wilk, District Horticulturist, Alstonville and John Slack, Policy Officer (Horticulture), Orange*

## Background information

Stone fruit trees enter a dormant period that is generally referred to as a "rest period". The amount of cold needed by a plant to resume normal spring growth following the winter period is commonly referred to as its "chilling requirement". Low chill varieties differ in their winter cold requirement and fruit growers need to consider the chilling requirements of the varieties they select for planting.

If a variety gets too much winter chilling, it may flower too early and be damaged by frost. If the chilling is insufficient, flowering is delayed, flowering occurs over a longer period of time, leafing is sporadic and sparse (occurring first on the terminals and at pruning cuts) and crops are light with pointed fruit and delayed ripening.

Varieties receiving the right amount of chilling have a normal flowering and leafing, good fruit set and round attractive fruit at ripening.

## Calculating chill units

There are number of models used for calculating chill units. The traditional method of measuring chill units is calculated using the number of hours below 7.2°C. Weinberger published a model in 1954 that estimated the number of hours under 7.2°C based on the average temperature of the coldest month. This model is useful in measuring the relative coldest of winter for the cooler temperate regions in Australia.

In 1973, Richardson and others developed the "Utah" model to predict the rest period of Redhaven and Elberta peaches (both with high chilling requirements). Using a mathematical equation and hourly temperatures, chill units were calculated and accumulated for the season. This model assumed the optimum chilling temperature for these varieties is 6°C. This model has not proven accurate under mild climatic conditions in which low chill stone fruit are grown as the optimum chilling temperature of these varieties was found to be higher.

Gilreath and Buchanan in 1981 looked at this question and confirmed that the optimum temperature for low chill peaches was 8°C and that temperatures between 2 and 14°C contribute to winter chilling. It is now recognised that chilling effectiveness as measured by hours below 7.2°C is not an appropriate measure for low chill varieties. Temperatures in the range of 7° to 13°C have considerable benefit. For low chilling varieties such Flordaprince 13°C is as effective as 7°C to induce dormancy break. Temperatures above 21°C during the chilling period appear to be

detrimental and partially negate accumulated chilling.

To make things easier, low chill stone fruit varieties bred by Dr Wayne Sherman at the University of Florida, Gainesville are assigned a chill unit (CU) requirement based on the time of bloom in relation to standard varieties. At Gainesville, Florida the standards are: Okinawa = 150 CU, Sunred = 250 CU, Early Amber = 350 CU, Sunlite = 450 CU, Sungold = 550 CU and June Gold = 650 CU. The order of bloom dates for peach varieties of various CU's does not change when comparing trees of equal age and vigour. The variety with the lowest CU flowers first.

In choosing varieties for your area, chilling units can be estimated by relating the average temperature of the coldest month to the chill units for the winter period. (Mean or average temperature model). This gives a good indication of the coldness of winter for many climates.

Alan George and Bob Nissen, QDPI researchers claim that their new model is more accurate and reliable for subtropical conditions. The CU figure produced by this model normally 100 to 150 CU less than say the Florida model.

A simple model (Slack) calculating daily CU from daily mean maximum and minimum temperatures (number of hours below 12.7°C) was recently developed. It accumulates CU throughout the season providing real time information on how the winter chill is progressing. The CU calculated from this model relates well to the Florida model for the weather data obtained from the Tropical Fruit Research Station, Alstonville.

Calculating the chill units in your environment

To find the chill units in your environment, follow the following steps:

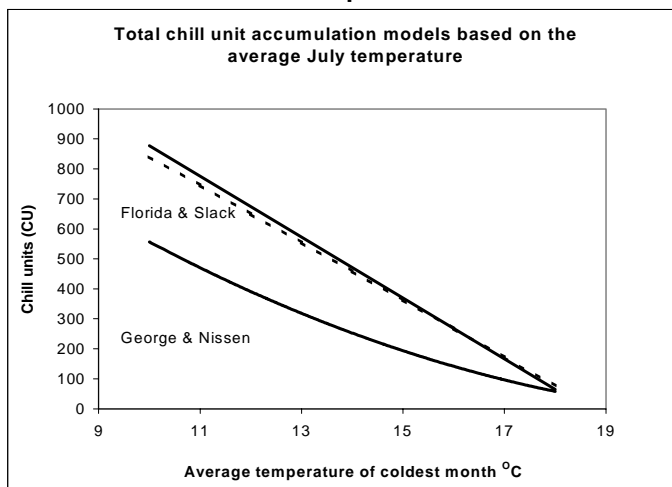
- Obtain the average monthly maximum and minimum temperature of the coldest month (normally July);
- Add the figures together and divide by 2, this is the average monthly temperature;
- Go to Graph 1 and locate the temperature on the bottom line of the graph;
- Draw a line up (at right angles to the temperature line) until this line intersects the curve or line;
- Draw a horizontal line across to the chill unit line;
- Read off the chill unit figure on the vertical axis.


### So what does all this mean to my orchard?

Variety selection and evaluation of new low chill stone fruit continues both in Florida and also Australia. The CU assigned to the Florida varieties match reasonably well with the North Coast climate.

When choosing a variety first calculate the chilling units for your locality. The Bureau of Meteorology has average climate data for many weather stations on their Website. If more detailed information is required for your orchard, an investment in a temperature recording device maybe required. Keen observations of variety performance on nearby orchards could also provide you with some ideas. Generally the low chill varieties are planted at a warmer site (and a higher elevation) while those with a higher chill are planted in cooler sites.

Graph 1



Varietal testing in your own orchard is the best way of seeing whether a variety is suitable to your orchard and microclimate. Remember always to compare trees (varieties) of the same age and vigour as this can significantly affect their performance and your observations. 



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# Queensland Fruit Fly Information Day

June 2001, Camden

## Qld fruit fly - a major pest

Queensland fruit fly prefers humid conditions, so in New South Wales it is best suited by the climate in coastal and northern inland areas (approximately north of a line between Sydney and Bourke). The south and south-west of the State are much less suitable to the Queensland fruit fly, but it can thrive there during years of favourable conditions or in the favourable microclimates of the towns and cities. In above-average rainfall seasons, fruit fly occurs more frequently in the west and south-west of the State.

## Quarantine Treatment Options:

**Bob Patton** (Policy Officer Market Access, NSW Agriculture, Orange)

**Area Freedom** – refers to an area traditionally free of fruit fly. A trade zone called the Fruit Fly Exclusion Zone (FFEZ) in southern NSW has been established to maximise the access to export markets by eliminating fruit flies from that zone and nearby areas. In the NSW portion of this area there have been outbreaks for the past 3 years and sterile insects (up to 10 million/week) have been used to control this. Because of the frequency of these outbreaks it appears that Qld fruit flies are now overwintering in the area. The Sydney Basin cannot realistically achieve an “area freedom status” as Qld fruit fly is endemic. You can never eradicate flies from this area as you will always have continual leakage into the area and you can never economically produce enough sterile flies to conquer the problem.

## Interstate Certification Assurance Arrangements

An Interstate Certification Assurance (ICA) arrangement is a voluntary agreement between NSW Agriculture and a business, through which the business undertakes specified inspection and treatment procedures to meet plant health requirements for intra and interstate markets. ICAs are accepted nationally, and are being increasingly adopted by businesses as a means of facilitating movement of produce. ICAs incorporate certification or quality assurance principles to guarantee adequate protection against the introduction of plant pests and diseases with produce. NSW Agriculture monitors the effectiveness of these ICA arrangements through a program of continuing audits. There are a number of ICA's in operation in NSW including:

ICA01 Postharvest dipping with dimethoate/fenthion  
ICA02 Postharvest flood spray with dimethoate/fenthion  
ICA04 Fumigation with Methyl-bromide  
ICA07 Cold Storage

The future of dimethoate/fenthion postharvest dips is uncertain and the use of Methyl-bromide will be limited to maybe the next 5-10 years.

For more information on Quarantine conditions contact:

**International:** Allan Johnstone 02 9364 7388 or  
Graham Nester 02 9364 7392

**Intersate:** Pablo Vazques 02 9764 3311 or Rob Bowman 02 4577 0633.

AQIS has a website which lists all Phytosanitary requirements for overseas countries - see [www.aqis.gov.au](http://www.aqis.gov.au)

## Other information about Qld Fruit Fly

- the emergence of pupae can be triggered by rainfall.
- preferred overwintering sites are warmer spots in an orchard, area or location. For example, compost heaps, rotting vegetation and grass & poultry sheds offer warmth and a food source.
- Monitoring traps should be placed about 1-2m (4 foot) above the ground on the shady sides (E, SE side) of trees.
- Place traps using a grid pattern (about 1-2 traps per hectare).
- Check traps weekly between September and May and record Qld fruit fly numbers.
- Change the bait mixture as per manufacturers recommendations.

## Case Study: Monitoring Qld Fruit Fly in a Blueberry Orchard (John McDonald).

For 10 years the 350 hectare Blueberry Farm at Corindi on the mid north coast has been the site where John McDonald has been monitoring Qld fruit flies with funding from Horticulture Australia.

When he started, management of fruit fly on the property was based on cover sprays every two weeks. By the second season the number of sprays were reduced to coincide with the peaks in fruit fly populations. In the third season a stonefruit orchard on the property was removed which reduced the fruit fly population even further.

At this stage a baiting program was introduced to replace the previous use of cover sprays. This program which focused on monitoring the population of Qld Fruit Fly over several seasons has resulted in the farm now having an ICA (No.31) for treatment of Qld fruit fly - which is a big change from the original fortnightly cover spray program. This outcome was the result of many years of monitoring fruit fly populations and movement. It is still heavily reliant on monitoring by trained personnel which drives the process.

There are a number of strategies used for Qld fruit fly control on the property which is dependant on the market destination of the fruit.

### **New products on the horizon**

The site has also been used to trial some new products being developed in conjunction with Aventis. These products are still in the development stage and it will be up to 2 years before both are registered for commercial use.

The old protein fruit fly bait spray was developed in the 1950's and has changed little over time.

A new bait spray (to attract female flies) being developed by Aventis is mixed with a protein autolysate solution. The product sticks to foliage and stays wet by rehydrating with moisture (such as dew). The likely program of use in an orchard would be a dose (using a single nozzle) to the lower canopy of trees on the shady side. This would be required once a week for 3-4 weeks prior to fruit ripening and then once after harvest. This product is likely to be registered in the next 12 months.

The second product being trailed by Aventis is a passive bait device that attracts and kills male flies by contact and ingestion. The product is a papermache disc impregnated with a pheromone and the insecticide. The product should have a life of 2 months and would be placed (27-50m spacing) in shady spots as a barrier around the fruit block. The product would be used in conjunction with the bait sprays. This product is unlikely to be ready for commercial release before 2003.

Both products are designed to be used in conjunction with good orchard hygiene practices - that is picking up and destroying fallen fruit.

### **Improved protein bait formulations for fruit fly control (Project AH00012)**

Fruit fly researchers from Qld, NSW and WA who are participating in a national fruit fly control project recently met in Brisbane with international fruit fly bait expert, Dr Robert Mangan from the USDA laboratory at Weslaco, Texas. Dr Mangan was visiting Australia in his role as a collaborator in the project, which is designed to make the latest in bait technology available to Australian horticultural producers. Dr Mangan and his colleague Dr Daniel Moreno are world leaders in formulating protein baits which incorporate the new generation of safer insecticides for fruit fly control.

The project team which is being lead by Dr Annice Lloyd, Queensland Horticulture Institute, Queensland Department of Primary Industries, includes Dan Smith, Rosemary Kopittke and Ed Hamacek from QHI, Andrew Jessup and John Macdonald from NSW Agriculture, and Dr Francis de Lima and Dr Sonya Broughton from

Agriculture WA. Funding for the research is being provided by the departments of agriculture in each state, Horticulture Australia Limited, AusHort, and by two commercial partners, Dow AgroSciences and Aventis.

Both commercial partners have new fruit fly bait products which are being evaluated by the research team prior to application to the NRA for registration in Australia. These new products include two of the new generation of safer insecticides which have not previously been registered for fruit fly control in Australia. The new bait formulations also contain components designed to extend the life of baits in the field.

Longer lasting, safer baits would provide many advantages both to horticultural producers in endemic fruit fly areas as well as to regulatory authorities throughout Australia involved in fruit fly suppression and eradication programs. The research team will test the new products against representative crops of all fruit fly host groups and against fruit fly pest species both in eastern Australia where Queensland fruit fly is the major pest species and in Western Australia where Medfly is the pest species. It is hoped that residue and efficacy data will be available for registration application for both products within the next two years.

The project also includes a component of generic research to examine other means of improving bait formulations and bait technology. Two such potential improvements are the use of photoactive dyes as toxicants in baits and the development of effective, long lasting, bait stations based on protein attractants. The latter have the added advantages of being an off-crop treatment thereby reducing any risk of phytotoxic damage due to bait application. Both of these new technologies may have applications for organic producers.

The researchers in the three participating states have received excellent support from growers who have been willing to participate in bait trials in a variety of commodities. Because the development of improved fruit fly baits is of significant interest to a wide range of horticultural producers, an Industry Reference Committee, with representatives from each participating state, has been set up to monitor the progress of the project.

Fruit flies continue to be a major market access barrier for horticultural producers all over Australia. Protein baiting is an important control method for this pest in endemic fruit fly areas and for quarantine authorities in fruit fly free areas. Improved, safer baits would provide more effective control with additional economic and environmental benefits. This project is a coordinated national approach to address some of the current problems with baiting and to make the latest in bait technology available to Australian horticulture industries.



# Nutritional impacts on fruit size and tree health in citrus

## *Notes from a presentation to citrus industry personnel in the Riverland, September 2001*

*Tienie du Preez, Agricultural Consultants International, South Africa*

Citrus fruit need to have an extended shelf life with retention of quality and the absence of physiological ailments. Good keeping quality is therefore of utmost importance. Nutrition is only one of several factors which can influence fruit quality.

There is no better way to determine the nutritional needs of a citrus orchard but to use an integrated approach i.e. using historical leaf, soil and fruit analysis together with historical nutritional data, growth indexes, production records, quality assessments, pack-out percentage, soil type, aspect, area, rootstock, planting density and light interception, etc.

### **Nitrogen (N):**

Nitrogen is an integral part of amino acids, protein, nucleic acid, chlorophyll, all co-enzymes and hormones, like ABA and Cytokinins. It therefore plays an important part in the living machinery of citrus trees.

High nitrogen levels can improve fruit set but excessively high levels reduce fruit set due to competitive shoot growth. High nitrogen levels also reduce fruit size probably due to more fruit set but also due to shoot / fruit competition and lack of light caused by vigorous and dense canopies. Excessive nitrogen also causes thick peels, low juice content, higher acid levels and rind (albedo) breakdown. The latter is caused by a competition with calcium. High N levels can also retard colour development and the harvest date.

Leaf nitrogen levels of 2.10 – 2.30% for Satsumas, Clementines and Valencias and 2.40 – 2.60% for Navels and Lemons are considered optimum.

### **Phosphorus (P):**

The main metabolic function of Phosphorus in citrus trees is the formation of pyrophosphate energy bonds like in ATP, UTP, CTP and GTP. All these nucleotide triphosphates are involved in synthesis of RNA and DNA. It is also an essential part of many sugars involved in photosynthesis, respiration, etc.

Low P levels causes soft/flabby fruit, coarse skins, low juice content and high acids. Too high P levels can lead to thin skins and resultant skin breakdown.

Phosphate levels of 0.12 – 0.15% in citrus leaves are considered optimal. Phosphate applications and foliar sprays are often applied prior to or during the ripening

phase to promote better skin finish, stimulate colour formation and to stimulate conversion of high acids to sugar. Too much phosphate in the soil can precipitate calcium and potassium, which can in turn lead to poor quality and small fruit.

Leaf N:P ratios for Navels should be 20 when leaf N is at the lower range (2.4%) and 15 at high leaf N levels (2.6%) to ensure good fruit finish, sugars and colour.

### **Potassium (K):**

This is the most important cation in plant tissue where it is involved in meristemic growth (synergism with IAA, GA, Cytokinins), photosynthesis, and translocation of photosynthates. Potassium is of utmost importance in maintaining the water status in the plant and regulating the opening and closing of stomata. Potassium does not form part of any structural organic substances and makes up about 80% of the total cations in the cell sap. It also activates enzymes.

Low K levels cause small size and severe deficiencies can restrict vegetative growth. An over supply of K causes coarse skin, high acid levels, retard ripening and can lead to big fruit sizes in navels. Excessive K applications can also decrease calcium levels and increase albedo breakdown.

Leaf K levels of 0.90 – 1.50% are generally accepted as optimum for most citrus varieties with 0.80 – 1.10% for Navels.

The leaf N:K ratios for Valencias should also be considered especially where small fruit sizes are encountered. Aim for a N/K ratio of 1.6 for high leaf N (2.3%) and a ratio of 2.2 for low leaf N (2.1%).

### **Calcium (Ca):**

Calcium is important for cell growth and cell division and is imperative for quality, shelf life and prevention of albedo breakdown. The primary role of calcium in plants seems to be membrane stability.

Optimum leaf Ca levels are 3.5 – 6.0%. Leaf analysis is not a good indicator of fruit quality because most of the calcium moves with the transpiration stream in the xylem to the leaf and very little (probably less than 6%) of the calcium rich water is partitioned to the fruit. Fruit skin analysis (skin + albedo) will probably be a better indicator of skin quality. Calcium is also not transported from the leaves to the fruit.

Calcium is seldom deficient in the soil. Cultural practices like poor irrigation, unbalanced fertilization programs (too much Magnesium, Ammonium,

Potassium, Phosphates) causing poor calcium uptake and distribution to the fruit are to be blamed for low fruit calcium levels. Calcium nutrition during the cell division stage is imperative for good skin quality and low albedo breakdown. Pruning increases the light penetration and transpiration to inside fruit, which decrease albedo breakdown.

#### **Zinc (Zn):**

Zinc is involved in nitrogen metabolism and deficiencies will inhibit protein synthesis. It also catalyses production of tryptophan, the precursor to IAA. Zinc also activates some enzymes and is involved in enzyme substrate binding.

Deficiencies of zinc cause poor growth, small leaf size, small fruit, lighter crops and low vitamin C content. Leaf levels of 30 – 100 ppm should be optimum.

#### **Boron (B):**

The function of boron in the plant is like that of phosphate in the formation of esters with sugars, alcohols and organic acids. It is therefore involved in transport and translocation of photosynthates and water in the plant. It is also involved in the translocation and positioning of calcium in the middle lamella of cells.

Boron deficiencies cause malformed fruit, dry peel, low sugars, poor set and inhibits cell differentiation. Boron levels in leaves should be maintained between 75 – 150 ppm. High levels (250 – 330 ppm) will cause tipburn and leaf drop.

#### **Other Elements:**

The less important elements or those not so directly involved in fruit quality is not discussed here but optimum leaf levels are as follows:

Magnesium	0.35 – 0.50%
Sulphur	0.20 – 0.30%
Manganese	40 – 150 ppm
Iron	60 – 300 ppm
Copper	5 – 20 ppm
Molybdenum	0.05 – 3.00 ppm

#### **Importance of leaf and soil analysis in making recommendations**

No balanced fertilizer program can be recommended without an annual leaf analysis and soil analysis every 2 – 3 years. Consider trends over time rather than exact figures. It is recommended to take leaf and soil samples from the same sites to be able to establish soil / leaf correlations.

#### **Summary**

The production of big crops of good quality fruit with a long storage life is not a simple task and it demands a great deal from producers. With regard to fertilization the emphasis should be a balance between elements and controlled vigour, through controlled nutrition in order to achieve an economic equilibrium between production and quality.



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## **WHEREVER WE GO, WE MAKE IT GROW**

# Irrigation of citrus with reference to water shortages

*Tienie du Preez, Agricultural Consultants International*

Water is a powerful tool that can be used to manipulate vegetative growth, reproduction, fruit quality, size, colour, sugar, acid, and juice content, sunburn and can even change the root distribution pattern in the soil.

Water scheduling has an important effect on nutrient uptake, transport of elements to the active sites and also the transport of photosynthates especially to the target organs (fruit). Water is the single most important molecule in plants because it drives the metabolic machinery of the plant.

The target should therefore be to use this tool to optimize production and quality without wasting our most important resource.

## Ideal scheduling

Regarding irrigation scheduling the citrus tree phenology can be divided in to five phases.

The **recuperation phase** after harvest can be quite long for early varieties like Satsumas or almost non-existent for late varieties like Valencias. The first two to three weeks directly after harvest is an important period to recuperate lost reserves and to provide enough water for nutrient uptake.

The tree can resist some water stress but take care of too much stress in the flower initiation period (April, May). A slight regulated water deficit prior to flower initiation can promote more flowers for the next season but again, take care not to lose fruit size on varieties with fruit on the tree during this period. Use 50-60% extraction of Total Available Water (TAW) for cropped varieties and 35-40% for non-cropped cultivars.

From budswell to first flower (**the reactivation phase**) the tree needs enough water and nutrients to force a strong, even flush with flowers. Good root temperatures (15-25°C) and enough oxygen (8-10%) are also imperative. So, the idea is to apply enough water to allow good rootzone temperature and oxygen levels. Water extractions of 40-50% of TAW should be used.

During the flowering, fruit set and **cell division stage** (flowering to final fruit drop in late November) water must be held back (but without stress) to force the tree to set fruit and to control unnecessary shoot growth.

The cell divisions are not sensitive to slight water deficits. Stress can however cause Abscisic Acid (ABA) production in the root system, which will be

transported to the canopy with the next irrigation, and will cause fruit drop.

The October/November shoot flush will also compete with the small fruits for photosynthates and hormones (cytokinins) and can therefore cause poor fruit set. This flush is not important for the next crop except for young trees that need to fill space.

Holding back water without causing stress (like wilting) to contain growth and set fruit is the objective with scheduling during this critical 2-3 months. The only way to do this is by means of "helplines".

Install a line on 10-12 trees delivering only half of the designed flow and a double line to 10-12 other trees.

Apply the water in such a way that the half-line shows some stress with no stress on the normal orchard lines. This would result in no flush on the normal lines and some flush on the double lines.

**The fruit enlargement stage** (final fruit drop until 3 weeks before harvest) needs a lot of water to grow big fruit. Irrigate according to the double line. Measure fruit growth during this period.


If the double line gives better fruit size, increase the water until such time that the normal line has the biggest fruit. Water extractions of no more than 30-40% of TAW should be allowed.

Less water can be applied in the **ripening period** (from three weeks before harvest and during harvest) to concentrate more sugars, burn high acids and to force colour development.

Be careful not to stress the trees too much if this period falls within the flower initiation period. Extractions of 50% of TAW can be implemented.

## Irrigation scheduling during critical water shortages

Droughts necessitate the effective and optimum use of each droplet of water. The biggest savings can be achieved after the recuperation phase, even the reactivation phase (still cool temperatures) but especially during the long cell division phase and lastly during the ripening phase. Very little savings can be made during cell enlargement.

Trees that were irrigated and fed optimally in the past have a better chance to survive. Orchards on soil with higher water holding capacity and cooler slopes/areas can also resist droughts better than those on sandy soils and hot slopes/areas. 

# Compost in horticulture –its safe use

*Reprint of Agnote DPI-347, January 2001*

*Brian Beattie, Horticulturalist, Horticultural Research and Advisory Station, Gosford*

Composts are used frequently in both vegetable and tree crop production to assist crop growth. The major problem using compost in horticulture is contamination of the product by microbes from the compost. These microbes can cause sickness in humans - they are human pathogens. However, this happens only if the composting procedure has not been carried out correctly.

## What is Compost?

Composts are made from organic material such as any plant products or animal manure, or a combination of both.

Composting converts biodegradable organic material into humus by using “good” microbes called thermophilic organisms. The process is generally conducted by aerating the material over a period. The microbes decompose the matter into material that can be more easily used by growing plants. During the process, the “good” microbes cause all the material to heat and this kills the “bad” microbes. Killing off the bad microbes with heat is called pasteurisation. At the same time weed seeds and other undesirable material is neutralised.

The Australian Standard for Composts, Soil Conditioners and Mulches defines the terms Pasteurisation and Compost:

- Compost - Pasteurised product which has undergone composting for a period of not less than six weeks
- Pasteurised product - organic material resulting from the controlled microbiological transformation of organic materials, under aerobic and thermophilic conditions, such that the whole mass of constantly moist material is subjected to at least three consecutive days at a minimum temperature of 55°C.

This is achieved by:

- appropriate turning of the outer material to the inside of the windrow so that the whole mass is subjected to a minimum of three turns - with the internal temperature reaching a minimum of 55°C for three consecutive days before each turn; or
- an equivalent process that achieves the same level of pathogen reduction The time taken for

composting to complete depends on the system used and factors such as the material, moisture content, aeration, nutrient ratio, pH, toxic substances and temperature. Common systems used for composting include turned pile, aerated static pile, wind-row and in-vessel.

Generally it takes between six and 10 weeks, with a curing period of two to three months, to ensure that the compost is mature.


## Managing the Risk of contamination

Before you use a compost - or any form of animal manure - you should assess the risk of it contaminating the produce you grow. Keep a written record of the risk assessment. Changes in the type or source of compost or animal manure you intend to use, or the type of produce you grow, may require the risk assessment to be re-evaluated

Care should also be taken that run-off from the compost heap does not contaminate the surrounding soil or equipment. This should be included in the risk assessment.

There is a significant risk of microbial contamination of produce - particularly for ground crops - if the origin of the organic material is unknown, or it has not been composted under

## Further Information

Full details of the types of composting systems available and detailed guidelines of procedures required can be found in: Australian Standard AS 4454-1999 Composts, soil conditioners and mulches Standards Australia, second edition 1999. 

## Diagnostic Service - NSW Agriculture

The Diagnostic & Analytical Laboratory at Wollongbar offers a range of chemical tests for soils, plant & water, essential oils and pesticide residues.

For information on prices and test details: Contact Kerrie Gray on 02 6626 1103

\* *Special prices may be offered for large batches of tests.*

# NSW Agriculture's plant health diagnostic service

NSW Agriculture's Plant Health Diagnostic Service provides an integrated research and extension service and undertakes disease surveillance in addition to diagnostic work. This diagnostic service has continued to operate since the closure of the BCRI Laboratory at Rydalmere in 1994. The service was restructured in November 1999, to provide an improved network across the State.

As the service matures and with the introduction of a client-focused service and Quality Assurance, it is expected that growers using this service will receive positive outcomes. The benefits of the accurate diagnosis of pest or disease are improved quality and market value of domestic and export produce and money saved on chemicals and labour.

In line with government policy, full cost recovery for all testing is now charged by the service. Test prices can be obtained from your local laboratory. A list of laboratory locations and an abbreviated list of tests can be found at the end of this article.

The largest of the Plant Health Diagnostic Laboratories is at Camden and is one of 8 laboratories providing a network of diagnostic service from Alstonville, Gosford, Orange, Tamworth, Wollongbar, Wagga and Yanco. The Orange site provides particular expertise in pest and pathogen taxonomy, bacteriology and fungal identification. The department's collections units are housed at Orange and are the repository of information vital to the diagnosis of pest and disease in crops for NSW growers. Inorganic and organic chemistry services are located at Wollongbar and Wagga. Diagnostic services to various industry groups and growers can be supplied through this network. Growers may send samples to any one of the sites for analysis and diagnosis at the appropriate location.

NSW Agriculture's extension and advisory officers can provide advice to growers concerning pest and disease related to their local conditions, these officers complement the diagnostic service. Each of the Plant Health Diagnostic laboratories brings **specialist** diagnostic expertise to the network. The pathologists undertaking plant diagnoses are each closely related to specific industries and thus have a greater understanding of growers and industry needs.

Transport of samples to NSW Agriculture laboratories is included in the test cost if sent through the approved carrier, using the appropriate submission form. These can be sourced from any of the Plant Health Diagnostic laboratories within NSW Agriculture, and all district Offices.

Listed below are the addresses of the sites accepting samples on behalf of the Plant Health Diagnostic Services for NSW Agriculture.

(All sites also accept samples for chemical residues in plants, soil and water, water analysis (chemical), nutrient analysis of plants and soil done at Wollongbar/ Lismore/ Wagga.)

## **Alstonville Tropical Fruit Research Station**

Ph 02 6626 2400 Bruxner Highway Alstonville  
Postal address - PO Box 72, Alstonville NSW 2477

**EMAI** Ph 02 4640 6428

Elizabeth Macarthur Agricultural Institute  
Woodbridge Road Menangle  
Postal address - PMB 8, Camden NSW 2570

**Gosford** Ph 02 4348 1900

Research Road Narara NSW 2250  
Postal address - Locked Bag 26 Gosford NSW 2250

**Orange** Tel: (02) 6391 3800

Forest Road Orange NSW 2800

**Tamworth** Ph 02 6763 1100

Calala Lane Tamworth NSW 2340  
Postal address - RMB 944, Tamworth, NSW

**Wollongbar** Ph 02 6626 1103

Bruxner Highway Wollongbar NSW 2477

**Wagga** Ph 02 6938 1999

Pine Gully Road Wagga Wagga NSW 2650  
Postal address - PMB, Wagga Wagga NSW 2650

**Yanco** Ph 02 6951 2611

80 Trunk Road Yanco NSW 2703  
Postal address - PMB, Yanco NSW 2703

## **Brief List of Tests**

<i>Entomology</i> - insect/mite general ID	.....\$32.25
<i>Entomology</i> - insect/mite specialist ID	.....\$89.10
<i>Entomology</i> - insect/mite general ID	
- with search	.....\$63.00
<i>Plant health</i> - nematode extraction	
- root and soil	.....\$41.30
<i>Plant health</i> - nematode ID and	
- count to genus	.....\$53.55
<i>Plant health</i> - Basic exam	
- clinical examination and general diagnosis of plant diseases	.....\$42.95
<i>Plant health</i> - Standard exam	
- clinical and microscopic examination of plants with moist incubation & diagnosis	.....\$59.95
<i>Plant health</i> - Comprehensive exam	
- clinical & microscopic examination with culturing and diagnosis of pathogens from plants, soil or water	.....\$110.25



# The use of Giberellic Acid (GA) for citrus fruit quality


By Frank Galluccio (Sumitomo Chemical)

- ◆ **Water pH must be 4 to 4.5, use a Buffer or Adjuvant**
  - Adjuvants contain a spreader in the formulation, so there is no need for a spreader
  - Buffers do not contain a spreader, add a spreader at label rates.
- ◆ **Use a high volume sprayer**
  - Coverage is vital - spray penetration into the canopy is critical
  - Apply a minimum 7500L/ha to mature medium sized trees
  - Calibrate the sprayer
- ◆ **Trees must not be under any water stress prior to and after GA application**
  - Good irrigation management is required, trees must not be under-watered or waterlogged
- ◆ **Spray during slow drying conditions,**
  - Early mornings (avoid dewy mornings)
  - Late evenings (avoid heat in fruit).
- ◆ **Avoid heat spells of 40 degree days, spray after a cool change.**
- ◆ **Apply stop drop sprays as per normal**
  - Do not mix ProGibb® with Stop drop®.
- ◆ **Avoid Oil & Copper sprays close to GA applications**
  - Best to apply GA prior to oil or copper application
  - If copper or oil sprays are applied, wait 4 weeks to apply GA.

- ◆ **Avoid ProGibb® application if rain is forecast within 6 hours.**
- ◆ **Avoid mixing other compounds with ProGibb®.**
- ◆ **Avoid using ProGibb® on unhealthy trees.**

Pro-Gibb - Washington Navel (Application Timing Chart)		
Timing	Early Application Jan-Feb: Golf Ball Stage	Late Application Mar-April: Green-Silver Stage
Early Harvest American Market - Creasing	10-20 ppm	Nil
Early & Late Harvest History of creasing, delay harvest	10 ppm	10 ppm
Late Harvest Creasing & Delay Rind	20 ppm	Nil
Late Harvest Delay Rind	Nil	10 ppm

*Note: Use higher rate when there is a history of creasing. Refer to ProGibb® mixing chart for ppm. Growers will have specific applications to suit their markets. The early application is critical. All the above applications will have firmness/ shelf life & storability effect.*

- ◆ **Early application can delay full colour by about 0-7 days and late application by about 2-3 weeks**
  - Delay in colour development is dependant upon variety, chemical rate, district and seasonal conditions
  - Best to trial and gain on-farm experience
  - Rates at 10ppm for late navels in some situations have resulted in a long delay in full colour. 

## Sun World Appoints ANFIC Group as Australian Representative

Sun World International, Inc., and ANFIC (Australian Nurserymen's Fruit Improvement Company) have signed an agreement enabling ANFIC to introduce and promote Sun World's new fruit varieties to Australia.

ANFIC, a 12-member nursery consortium with facilities and representatives throughout Australia, will manage the importation, evaluation and commercialization of Sun World's table grapes, plums, peaches, nectarines and apricots.

Sun World has sent nearly 60 different new fruit varieties to Australia, a number of which are currently being evaluated by ANFIC for potential commercial production. Some are available now for grower evaluation while others will be available in the coming year or two. Selected growers will be licensed to produce these proprietary varieties. All fruit will be sold under license by designated marketing companies.

The California-based company is best known for fruit such as early-ripening green seedless grapes marketed under the SUPERIOR SEEDLESS™ brand and black skinned, red-fleshed plums marketed under the BLACK DIAMOND™ brand. More recent introductions include an early-ripening black seedless grape marketed under the MIDNIGHT BEAUTY™ brand and early-ripening high flavor apricots marketed under the HONEYCOT™ brand.

Sun World, one of the United States' leading producers and marketers of fresh fruit, operates one of the world's largest table grape and stonefruit breeding programs. Since its inception in the mid-1970s, the Company's Research & Development Center has released more than 50 new varieties with improved flavor, size, color, shelf-life and extended seasonality.

Sun World International (www.sun-world.com) is a leading innovator in the research, production, distribution and promotion of fresh produce. A wholly owned subsidiary of publicly-held Cadiz Inc., Sun World maintains integrated agricultural operations throughout central and southeastern California. ANFIC can be contacted on: 02 6332 6960.

# Publications - What's new



## ◆ 2001 Avocado Conference Proceedings

Some of the papers given at the recent 2001 Avocado Conference are available by going to the following Qld Fruit & Vegetable Growers Website:  
[www.gfvg.org.au/avocado/avocadoconf.html](http://www.gfvg.org.au/avocado/avocadoconf.html)

A CD is also available for \$40.

## ◆ WorkCover Rural Safety Guide

WorkCover NSW and the Rural Industry Reference Group have published a new 16-page magazine on rural safety, highlighting initiatives being taken to reduce rural death and injury.

Details of the ROPS Scheme are included in the magazine, along with a list of safety tips for tractor drivers. Copies are available from the website [www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au).

or from WorkCover's publications hotline, 1800 658 134.

## ◆ 2001 Horticultural Statistics

Horticulture Australia's Australian Horticultural Statistics Handbook 2000/2001 is now available. As usual, it is full of useful and timely information on production, consumption, exports, varieties, growing regions and seasons. The price is \$60.

Contact Veronica Salaberry 02 8295 2311

## ◆ How Green is Horticulture?

Australian horticulture has released stage one of 'Horticulture, productivity and sustainability' - a bold new project investigating natural resource use by Australia's horticulture industry. The report profiles the horticultural industry's environmental challenges in relation to current and long-term economic performance, production capacity and potential benefits to the Australian economy and society.

'Horticulture productivity and sustainability' is a joint initiative of Australian Horticulture, through its AusHort program and the Natural Land and Water Resources Audit, a program of the National Heritage Trust.

For copies of the report contact:  
Evonne Lovric, at Horticulture Australia,  
Phone 02 8295 2300.

## ◆ ANZFA user guides on the New Food Rules and the Labelling of Genetically Modified Food.

The Australia New Zealand Food Authority (ANZFA) today launched a range of user guides to help food businesses, retailers and food officers to interpret and apply the new joint Australia New Zealand Food Standards Code. A user guide on GM food labelling has also been developed by an inter-government task force.

The user guides are both on the ANZFA website [www.anzfa.gov.au/foodstandards](http://www.anzfa.gov.au/foodstandards) and available in hard copy through ANZFA's publishers Anstat. Call 03 9278 1144. ANZFA also runs an information service for industry on the new Food Standards Code which industry can email at [advice@anzfa.gov.au](mailto:advice@anzfa.gov.au) or call toll free 1300 652 166.

## ◆ Tocal releases books on Organic Farming

The organic farming books are the result of extensive research and development by NSW Agriculture education officer, Mrs Jennifer Laffan. The books provide details of case studies of a wide range of enterprises in Australia and focus on the production of certified organic produce.

The books sell for \$28.00 each plus \$5.00 postage and handling. Further details on the publications are available on free call 1800 025 520 or at the Tocal website [www.tocal.com](http://www.tocal.com)

## ◆ Two new manuals on Irrigation of Vegetables

Two new irrigation manuals produced by NSW Agriculture and Agriculture Victoria will help vegetable growers boost productivity through efficient, effective use of irrigation water, according to NSW Agriculture project officer at the Yanco-based, National Vegetable Industry Centre (NVIC), Jane Hulme.

The manuals, '*Best Management Guidelines for Irrigation of Melons*' and '*Best Management Guidelines for Irrigation of Onions and Carrots*' will be released soon.

Both are based on results from The Vegetables Irrigation Best Practice Project and combine knowledge and skills from growers, researchers and consultants.

For more information contact:  
NSW Agriculture project officer at:  
the National Vegetable Industry Centre, Yanco,  
Jane Hulme on 02 6951 2521.



## ...continued

### ◆ Information on Sharefarming

NSW Agriculture has released a new Agfact about sharefarming, a useful guide for both prospective sharefarmers and landowners. Titled "Sharefarming agreements for growing crops" the Agfact was prepared to meet the growing demand for information on which to base decisions on agreements for shared use of land.

The Agfact (M.3.8) is available at a cost of \$2.00 from NSW Agriculture offices throughout the State, or from NSW Agriculture's bookshop on 1800 028 374. It is also available on the department's web site at [www.agric.nsw.gov.au](http://www.agric.nsw.gov.au).

### ◆ Soil health: The foundation of sustainable agriculture - Proceedings of a workshop on soil health held at Wollongbar Agricultural Institute 20-21 June, 2001.

The 174 page book contains 22 papers on biological, chemical and physical aspects of soil health and their impacts on agricultural productivity.

The papers have been written in plain English to encourage interest and awareness in soil health among farmers, advisors and the general community. Each paper includes author contact details so that readers can contact them for more information. Copies can be obtained from Wollongbar Agricultural Institute for \$20 (including GST) or \$25 posted. Phone 02 6626 1200.

### ◆ Citrus Variety information available on the Australian Citrus Growers Website - (<http://www.austcitrus.org.au>)

#### Citrus Variety Information Sheets:

<u>Grapefruit</u>	<u>Lemon</u>	<u>Mandarin</u>	<u>Navel Oranges</u>
Flame	Eureka	Afourer	Atwood
Henderson	Fino	Amigo	Autumn Gold
Marsh	Lisbon	Arrufatina	Barnfield
Oroblanco	Verna	Clausellina	Chislett
Ray	Yen Ben	Clementard	Christensen
Ruby		Clementine	Clark
Rio Red		Daisy	Fisher
Ruby/Redblush/Pink		Ellendale	Hutton
Star Ruby		Ellenor	Lane Late
		Eloise	Leng
		Encore	Loxgold
		Fallglo	Navelate
		Fortune	Navelina
		Fremont	Neilson
		Hernandina	Newhall
		Hickson	Pasin
		Imperial	Powell
		Miho	Rohde
		Murcott	Ryan
		Novo	Summer Gold
		Okitsu	Thomson
		Page	Wiffen
		Pixie	Wilson
		Sunburst	
		Topaz	



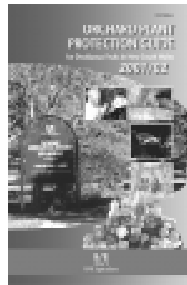
### ◆ New Plant Health Australia web site launched

Plant Health Australia (PHA) today announced the launch of its new web site located at:

[www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au)

The site provides information on the status of current research projects and interested parties can download relevant research reports and discussion papers from the various projects being undertaken by PHA. The site also provides an overview of how particular research projects fit within the major priorities of the organisation.

### ◆ 2001/02 Orchard Plant Protection Guide - available NOW



NSW Agriculture has released the 11<sup>th</sup> edition of the Orchard Plant Protection Guide for Deciduous Fruits in NSW 2001/02. Available from your local district horticulturist and as well, the Guide will be available on NSW Agriculture's Website.

## What's on

### 27 October 2001 - What's new in pest and disease management for cut flower growers? Dural Country Club, 662a Old Northern Road, Dural 1-4 pm.

A free information day for cut flower growers is being organised by Alan Merriman of Organic Fertilisers and Bettina Gollnow, Development Officer (Floriculture) with NSW Agriculture. The program includes guest speakers and displays related to the theme of new products and developments on pest and disease management of flower crops. The program will also give growers a great opportunity to hear more about the latest in greenhouse developments in Europe and America from Jeremy Badgery Parker, District Horticulturist (Protected cropping).

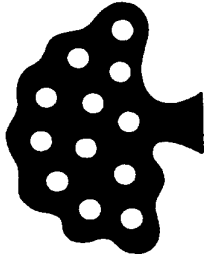
### 6-8 November. Environmental Management Systems in Agriculture Conference, Ballina. Ph. 02 6626 1237.

### 16-18 October Australian National Field Days, Orange. Ph. 026881 1286.

### 17-18 November. Safe Use of Tractors Course, Tocal College, Patterson. Ph. 1800 025520.

### 8-12 July 2002. Snack Fruit 2002. Combined Fruit Industry Conference. Brisbane, Qld.

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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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### NSW Agriculture 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 - Tocal 02 4939 8888**

Tony Somers - District Horticulturist  
Norm Cross - Irrigation Officer  
Alan Richards - Irrigation Officer  
Graeme Brown - Agricultural Inspector  
Mobile: 0427 007354 Fax: 02 4939 8961

**Windsor 02 4577 0600**

Peter Malcolm - District Horticulturist  
Bill Yiasoumi - Irrigation Officer  
John Gillett - Irrigation Officer  
WaterWise Officer -Matt Plunkett  
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 Agriculture  
HRAS Locked Bag 26  
Gosford NSW 2250  
Ph: 02 4348 1900  
Fax: 02 4348 1910  
email: [sandra.hardy@agric.nsw.gov.au](mailto:sandra.hardy@agric.nsw.gov.au)