

COASTAL FRUITGROWERS' NEWSLETTER

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NSW Agriculture

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

No. 45 Winter 2002

Dear Growers,

Welcome to the winter edition. Inside you'll find a number of interesting articles from several field days and meetings.

There is also the annual update on what products are registered for Pest/Disease control in citrus which can be pulled out from the middle of the newsletter and kept in the shed.

The 2002/2003 Orchard Plant Protection Guide for pome and stone fruits should be in district offices by late July.

Don't forget about the new law for keeping records on pesticide application which comes into effect on July 31st 2002. (see page 20). Inserted in this issue is a sample record sheet that you may like to photocopy and use (see page 8).

Also, there's some short term changes to our extension services in the Sydney Region - see page 7 for details.

Happy reading

Sandra Hardy

FOR SALE

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\$575,000

This secluded and professionally run 6.8ha property is situated only 5 mins. from Alstonville and 10mins. from the coast or just 20 mins. to Byron Bay!

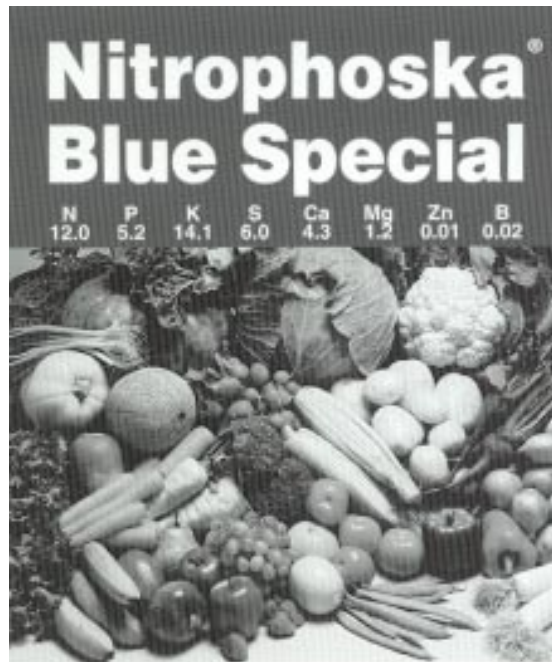
It is planted with 3500 early variety peaches and nectarines under hail netting and 350 cumquat trees. There is a three bedroom timber home with tropical garden; plus fully equipped packing shed, coolrooms and tractor sheds with all the equipment required. Unlimited water supply and early production are major features of this orchard.

It can be run either by the future owners or continue under the current lease arrangement. This is a rare opportunity to combine quality lifestyle with a sound investment. Further details and inventory lists are available from Duncan Woodhead - the current owner,

02 6628 1316 or 0415 729780.

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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Fruit Growers Seminar Bilpin - Report

Kevin Quinlan, Horticulturalist in Training, Gosford

On Wednesday the 15th May a series of presentations were given at a fruit growers seminar, outlining some changes to legislation that affect agriculture and updates on where research was up to in relation to different apple diseases. A summary of the main presentations applicable to coastal production are outlined below.

Alternaria fruit and leaf spotting in apples

Dr Shane Hetherington outlined results of research conducted into *Alternaria* fruit and leaf spotting of apples. Although *Alternaria* has been present within Australia for the past 10 years or so, it has only become noticeable in the past few seasons in the warmer and more humid regions of the Sydney Basin. The disease causes early defoliation of the trees in mid January, resulting in reduced yield and fruit size and impacts upon the following season.

The conditions that appear to favour the development of the disease are rain in late spring with temperatures between 25-30°C. Symptoms appear within 24-48 hours after infection. *Alternaria* is good at distributing itself throughout the canopy, with a uniform distribution evident. This means that control via spraying needs good coverage. Due to the ability of *Alternaria* to lay dormant in unfavourable seasons, a yearly control program needs to be adopted so that it can be controlled. This season there was little evidence of the disease due to the dry and mild conditions in the early season and then a warm end to the season. The record February rainfall saw some outbreaks occur.

Results of a trial conducted at Thirlmere and a survey conducted in the Bilpin district were presented. They found that more research needs to be conducted into which species of *Alternaria* is the causal agent (believed to be *Alternaria mali*), spray regimes that give effective control, and how other orchard hygiene practices help in the control.

Waterwise on the farm

An informative presentation on WaterWise courses and the financial assistance packages offered upon its completion was given by Matthew Plunkett (WaterWise Officer, Windsor). The course allows growers to learn new skills in irrigation management and shows how an irrigation and drainage management plan is produced. The course is free and all growers are encouraged to attend.

The major grants that can be applied for after completing the course are:

- A grant of 80% of the cost of an irrigation and drainage management plan (IDMP), to a maximum of \$12 000 per enterprise.

- A grant of 50 % of the cost of completed works, to a maximum of \$15 000 for works, as identified in an IDMP, which achieve a significant gain in the irrigation water use efficiency of an irrigation system.

- A grant of 50% of the cost of the works and/or services for crop water use monitoring, to a maximum of \$2,000 (Note: No IDMP is needed to access this grant).

The grants listed above are available until the 30th June 2003. For further information contact Matthew Plunkett, (02) 4577 0600.

Spray Diaries

Anna Ernst from the EPA gave a run down on the new laws pertaining to the keeping of pesticide diaries. These diaries are required by people who apply pesticides, property owners and those that use pesticides within their business. The spray record also acts as a good management tool. There is an exemption for horticulturalists for spot spraying in tree crops using hand held and hand powered sprayers when you are at least 20 metres from a property boundary. More information and assistance with the new law is available from your local EPA officer or by phoning the Pollution Line on 131 555 (cost of a local call from anywhere in NSW) or see page 20 of this newsletter.

Work Cover changes

With the adoption of the new Occupational Health & Safety (OH&S) Act (2000) and OH&S regulation (2001) there are some changes from the old 36 acts and regulations that have a significant impact. The new regulation has 3 key sections for risk management:

- Identify OH&S problems
- Assess the problem
- Control the problem (that is put in place systems to control the risk)

Under the new regulation, there is a duty to consult with people in the workplace on what risks are evident and how to control these risks.

A transitional period exists where employers are to start phasing in the new system, with the period being:

- 12 months from the 1/9/2001 for employers of 20 or more staff
- 12 months from the 1/9/2002 for employers of less than 20 staff

Under the new regulation, there is a duty of care to make safe access and egress (way out) from work areas and also make plant equipment safe. Procedures need to be developed to control risk. Instruction and the provision of information must be made available to all staff during the transition period, with the need for training programs to be developed.



Work Cover has produced over 30 codes of practice and many safety guides.

Hazardous substances must be labelled and MSDS sheets must be available to all employees. These need to be in a readily accessible format, such as in a file/folder in the shed [simply having them stored on a computer disk is not acceptable].

A register also needs to be kept of the chemicals kept on site and risk assessment of these needs to be carried out and recorded.

For information pertaining to the new act and regulation and your responsibilities contact the Work Cover Client Contact Centre on 13 10 50 or email contact@workcover.nsw.gov.au



Boron Deficiency in Apples

P Malcolm, District Horticulturist, Windsor

Boron Deficiency, also known as internal cork, has been seen in some apple orchards around Sydney in the 2001/2002 season.

Symptoms of boron deficiency include the appearance of spots of dead (necrotic) tissue within the flesh of the apple, (photo 1) which are usually referred to as "internal cork". External symptoms in susceptible varieties include the appearance of skin pitting of fruit while it is still on the tree and often when the fruit is small. In severe instances of the disorder, flesh cracking and splitting will occur (photo 2). In susceptible varieties, this disorder can lead to fruit distortion and stunting.

Varieties vary in their susceptibility, with some showing only fruit flesh pitting, while others show both flesh and skin pitting. Varieties such as Granny Smith, Lady Williams and Pink Lady can show severe symptoms, Jonathon and Delicious seem to be less severely affected.

Distribution of boron deficiency symptoms both within the tree and within an orchard can be erratic. Some limbs on a particular tree can be severely affected and others less so. Also, within a particular orchard block,

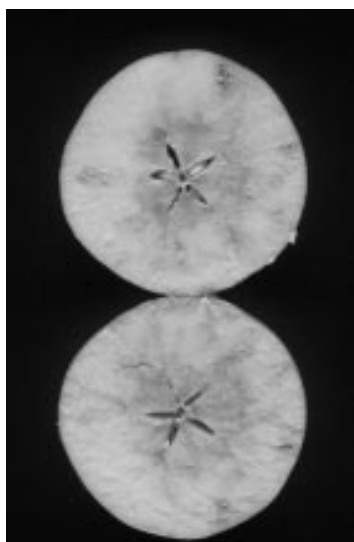


Photo 1: Internal cork of apples.

some trees or groups of trees can show severe symptoms, while others are less severely affected. Apart from directly affecting fruit quality and appearance, a deficiency of boron can also lead to leaf discoloration and twig die-back, which is usually more obvious in late summer.

The most reliable method of confirming a boron deficiency is by tissue analysis,



Photo 2: Severe boron deficiency in apple

especially as this disorder can be confused with Bitter Pit, a disorder related to fruit calcium levels.

However, some of the distinguishing features of a boron deficiency as compared to

Bitter Pit are as follows:

- Boron deficiency and in particular internal cork symptoms of boron deficiency will be present in fruit, despite regular foliar applications of calcium sprays throughout the season.
- Boron deficiency symptoms and especially internal cork, are usually more severe with heavy crops compared with light crops. The opposite is the case for Bitter Pit.
- Internal corking symptoms induced by a boron deficiency do not get worse when fruit is stored as compared with Bitter Pit, where fruit symptoms become more severe with storage.
- Internal corking caused by Boron deficiency can be severe within the core zone of an apple while symptoms of Bitter Pit rarely occur within the core zone.

Treatment for boron deficiency usually involves a foliar application of sprays containing boron. One suggested remedy is the foliar application in late spring, of 275gms of Polyborate powder (20.5%B) in 100 litres of water. However, there are several commercial proprietary brands of foliar fertilisers containing Boron, which can also be quite effective. Soil applications of Boron can also be effective in eliminating Boron deficiencies. However particular care needs to be taken with soil applications of Boron, as excessive amounts applied to trees can be dangerous and result in Boron toxicity.

For more information please contact your local District Horticulturist or your local chemical/fertiliser retailer.



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But what of the price your soil pays in the process?

Science is showing that Australian soils are tired and struggling to support crops after years of chemical fertiliser, pesticide and fungicide use. Soil health is as much a measure of what you put into it, as it is what you take out of it - and the survival of your business too often - ultimately depends on how you manage the soil and if it is a prudent choice to buy. This is where BioVerm is the Soil Smart choice.

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Contact either of our Qld based Agronomists, Bruce Moore 0409 185 690 or Steve Capson 0409 185 670. For all other States or all distributional locations, contact National Manager, Paul Patton 0400 284 051.

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Tensiometer tips and maintenance

Tensiometer tips

Jeremy Giddings, Irrigation Officer, Dareton

Tensiometers provide an easily interpreted guide to soil moisture levels.

A tensiometer is a closed tube filled with water, with a ceramic tip at one end and a vacuum gauge at the other. As the soil dries out, water is drawn out through the ceramic tip, creating a vacuum in the tube. When irrigation or rainfall occurs, water is drawn back into the tube, decreasing the vacuum. A high vacuum reading on the gauge indicates that the soil is dry, and a low reading shows that the soil is moist.

Preparation

1. Fill the tensiometer with clean water, leave the cap off and allow to drain through overnight. This saturates the tip and confirms that it is working. Do not handle the tip.
2. Fill the tensiometer with a mixture of rainwater (1 litre), methylated spirits (50 mL), and a few drops of food dye. Use a vacuum pump to remove any trapped air.
3. To test the tensiometer, replace the cap and leave the tensiometer out of the water for a couple of hours. The reading on the gauge should rise.
4. Place the tensiometer into the bucket of water. The reading on the gauge should drop within half an hour. The tensiometer is now ready for installation.

Installation

1. Make a 25 mm diameter hole that is 100 mm shorter than the tensiometer to be installed. Make a 19 mm diameter hole for the remaining 100 mm
2. Push the tensiometer firmly into the hole. Fill the hole with loose soil and pack it down. Heap the soil up around the tensiometer.
3. The number and length of tensiometers installed at each site depends on crop type and root depth. Tensiometers should monitor the moisture levels in the rootzone and just below this.

Covering tensiometers helps prevent frost and physical damage and reduces algal growth in them.

Maintenance

With regular maintenance tensiometers will provide years of reliable service. Every couple of weeks, loosen or remove the cap to allow any air bubbles to escape and to allow water to fill the tensiometer tube. A length of 3 mm tube can be used to dislodge any air bubbles.

Top up the reservoir if necessary. Replace the cap. Do it up until firm, then tighten it half a turn. Do not over-tighten! Perished stoppers cause problems. Replace the stoppers annually.

Interpretation

Reading	Interpretation
0–8	Soil is saturated (0) to near field capacity (8). Continued low readings indicate waterlogging.
8	Field capacity.
8–25	The best conditions of soil moisture and aeration.
25–35	Consider irrigation at critical stages of crop cycle.
35–50	Mild stress on well-drained soils.
50+	Soil is very dry: this will affect crop yield and possibly fruit quality.

Recording

Tensiometers should be read and recorded regularly, 2–3 times per week in summer. Ideally the figures should be graphed to provide a picture of soil moisture movement.

Tensiometers need periodic maintenance

John Gillett, Irrigation Officer, Windsor

Tensiometers are simple instruments, but, without regular maintenance, they are likely to give wrong readings.

Servicing a tensiometer

Take the opportunity during winter to refill tensiometers with cool clean boiled rainwater or distilled water. Use a vacuum pump to withdraw air bubbles, otherwise readings may be incorrect.

During frost periods, cover tensiometers: freezing temperatures can ruin the gauges.

A valuable management tool

To ensure you can manage your irrigation applications for overall watering efficiency, plant health and crop yields, you need to be able to trust your tensiometer.

What are the signs that your tensiometer is not working correctly?

Trouble sign: Gauge always reads zero.

(If correct, a zero reading means the soil is saturated from irrigation, rainfall or poor drainage.)

Possible causes

- No water in the tensiometer, or lost suction due to low water level: service and refill.

- The gauge is faulty: check and replace.
- A connection is leaking: check the general assembly including ceramic tip and all O-ring seals.

Trouble sign: Tensiometer does not seem to record the true soil moisture content.

Possible causes

- There is poor contact between the ceramic tip and the soil: reinstall correctly.
- The gauge is faulty: check and replace.


Trouble sign: Tensiometer requires frequent refilling.

Possible causes

- Filler cap or filler cap seal leaking: replace the seal or cap.
- Check for other seal leaks.

Trouble sign: Tensiometer responds slowly to irrigations.

Possible causes

- Water is slow to infiltrate between the ceramic tip and the soil. The ceramic tip may be sealed by salts: clean or replace.
- The gauge sticks (from minor damage): tap to test, and replace if faulty. 

Changes to NSW Agriculture's Commercial Fruit Grower Extension Services in the Sydney Basin

Some short-term changes with extension services for fruitgrowers in the Sydney Basin will be in operation from July to September 2002.

Peter Malcolm, District Horticulturist at Windsor, will be on long-service leave for 3 months from July to September. Lawrence Ullio, District Horticulturist at Camden, is currently on extended sick leave until at least mid-September.

During this time commercial fruit growers can contact Sandra Hardy or Kevin Quinlan (a new horticulturist-in-training) at Gosford. Kevin can be contacted on **02 43481913**.



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News in Brief

◆ NSW Agriculture Postharvest Group Expands

NSW Agriculture has shown its commitment to the horticultural industries of NSW by appointing three new postharvest scientists to the postharvest team based at the Horticultural Research and Advisory Station in Gosford. The positions have been filled by Drs Jenny Bower, John Golding and Suzie Newman. The three new researchers bring a wealth of experience and knowledge to NSW Agriculture and are keen to assist the development of the NSW horticultural industries. They will be joined by a postharvest pathologist later this year.

Dr Bower joins NSW Agriculture from the University of California, Davis following a one year postdoctoral appointment in the Pomology Department. While in the USA, Jenny worked on disinfection treatments for cherries, developed protocols for 1-MCP treatments of apples and pears, and examined the effects of ethylene in the storage environment on strawberries and Bartlett pears. Prior to this, Jenny worked at CSIRO Division of Horticulture in Sydney on factors relating to fruit senescence, for which she was awarded a Doctorate from the University of Western Sydney, Hawkesbury. In her new position at Gosford, Jenny will primarily be working on market access issues.



Dr. Jenny Bower

Dr Golding has recently completed two years as a research post-doctorate at Michigan State University in the USA working with the apple industry to improve the storage life of apples.



Dr. John Golding

John had previously worked in the Victorian Department of Agriculture at Irymple working on postharvest storage of table grapes and citrus for export.

Following this he completed his PhD at the University of Western Sydney, Hawkesbury on the

physiology and control of superficial scald, the long-term storage disorder of apples. John's research interests include maintaining and improving postharvest quality during storage, handling and transport.

Dr Newman transferred to the position in Gosford from Orange Agricultural Institute where she was a researcher in pome and stone fruit for the past four years. Prior to joining the department Suzie completed her PhD in postharvest physiology at Massey University, New Zealand. Her research focussed on improving the texture and quality of fresh and processed apples through modifications to the pre-, postharvest and processing environments. In her current position, Suzie will work with the horticultural industries on postharvest issues encountered throughout the supply chain.




Dr. Suzie Newman

These researchers will work across all crop commodities. They will be visiting horticultural areas within NSW to meet with growers and packers to discuss concerns and offer advice regarding postharvest practices.

Postharvest plays a vital link between the grower and the consumer. Growers take considerable time and effort to produce quality fruit on the tree, and postharvest practices are just as important in determining the quality of the end product reaching consumers. The postharvest team will help to inform growers of best practice methods while carrying out research experiments.

Some of the first projects the new group has planned relate to the effect of 1-methyl cyclopropene (1-MCP, an experimental compound to inhibit the action of ethylene) on green vegetables, treatments that improve the storage life of apples, and examination of the potential for high humidity, high CO₂ atmospheres to kill insects infesting fresh produce.

If growers and packers are interested in talking to the researchers, they can be contacted on (02) 4348 1900. 

Pesticide Application Record Sheet

Sandra Hardy

Inserted in this Newsletter is one example of a pesticide record sheet that could be used to meet the new law on keeping records of pesticide use. On the back of this record sheet is a copy of the Beaufort Wind Strength Scale which you can use to indicate wind speed.

Electronic copies of this sheet (in Word) can be obtained by emailing me a request at: sandra.hardy@agric.nsw.gov.au

There are also forms available from NSW Agriculture's website - <http://www.agric.nsw.gov.au/reader/13830> or the EPA website - http://www.epa.nsw.gov.au/pesticides/rec_keep_+form.pdf

News in Brief

◆ Taking Freshcare Forward

Clare Hamilton-Bate, National Marketing & Liaison Manager.



The Freshcare On-Farm Food Safety Program was developed to meet an industry need.

Growers wanted a food safety program that was credible, practical, national, industry owned, cost effective and suitable for all produce. Retailers, wholesalers, packers and processors wanted an upstream (on-farm) program focussed on food safety that would integrate with their own quality and food safety systems.

Launched in July 2000, Freshcare is an industry owned, not for profit program dedicated to making it as easy as possible for growers to implement their own QA system.

However, the market place is filled with a confusing array of food safety and quality management programs. Freshcare has recognised the need to more effectively promote the program whilst providing maximum support and communication to its owner industries and the wider fresh produce industry.

Through the newly established Freshcare office in Sydney and an enthusiastic network of approved trainers across Australia, access to the Freshcare program has been greatly simplified. The Freshcare package now guides growers through a streamlined process from initial registration to full certification, whilst at the same time maximising the opportunities for FarmBis funding.

Two packaged options are now available:

1. Full Freshcare Package – for growers who are new entrants to the QA process.

This package includes:

- Freshcare Membership
- Initial training (one day)
- Follow-Up Training (half day)
- Third Party On-Farm Training Assessment
- Freshcare Accreditation Certificate

2. Freshcare Follow-up Package – for growers who have undertaken an Approved Supplier course.

This package includes:

- Freshcare Membership
- Follow-Up Training (half day)
- Third Party On-Farm Training Assessment
- Freshcare Accreditation Certificate

All the administrative aspects of the program will be looked after, leaving the growers to focus on their

training and the implementation/adoption of Freshcare on their properties.

A third party training assessment is included in the Freshcare package to ensure that the delivery of the training has been effective and implemented on-farm. In subsequent years it will be necessary to have an Annual Third Party Audit conducted by a Freshcare approved QA auditor. Every effort will be made to maximise cost savings, for both individual growers and grower groups, through coordinated scheduling of annual audits wherever possible.

Through the newly established Freshcare office, the active marketing and promotion of the Freshcare Program, and 'hands on support' in its implementation, is a priority.

For further information contact Clare Hamilton-Bate on 02 9764 3244. 🌿

◆ Selling directly to the public? Requirements under the new Food Safety System

Kevin Quinlan, (Horticulturist in Training) Gosford.

With the introduction of national guidelines for food safety, there have been changes to the Food Safety Standard. The purpose of this new Food Safety Standard is to:

- Establish a nationally consistent approach to food safety regulation
- Improve food safety practices
- Reduce the public health threat of food borne illness.

This Food Safety Standard has implications for any grower who sells their produce directly to the public, including roadside stalls. In the Standard there is a section on the need to notify NSW Health of selling intentions. The requirement is for all food business proprietors, except those that are only selling foods (that are not potentially dangerous) which raise funds for community or charitable causes, to notify certain details to the NSW Health department. These details include the proprietor's name and address, the nature of the food business, and the location of all food premises used by the business. The notification requirements came into effect on 24 February 2002. After registering, a preliminary risk classification will be assigned to each business and subsequently confirmed.

Notification needs to be done as soon as possible. The easiest way is to Notify online at www.foodnotify.nsw.gov.au, as this service is free. If you do not have internet access, notification forms can be gained from your local public health unit (Central Coast (02) 4349 4845), but there may be an administration fee for handling your notification request. For further information, contact the NSW Health Food branch on (02) 9816 0268. 🌿



News in Brief

◆ Citrus soil priorities to be unearthed

Research and extension priorities for improved soil management in the citrus industry will be identified as part of a recently started project called “Managing horticultural soils: research and extension priorities”.

The Land Technologies Alliance, a partnership between CSIRO, DNRE VICTORIA, the University of Adelaide and Primary Industries and Resources SA, is conducting the project.

As well as citrus, the project will also look at priorities in vegetable and viticultural soils of southern Australia. Issues include soil structure, drainage, water and nutrient use efficiency and soil biological activity. The emphasis is on the whole rootzone of these crops, not just the topsoil. The research and extension plan developed by this project will be used as a basis for subsequent project proposals which address the identified research and extension priorities.

The key questions to be addressed by this project are:

- What are the known soil constraints to yield and quality, both short and long term?
- What are the environmental impacts of poorly managed rootzones?
- To what extent do industries recognise these constraints as problems?
- How do these constraints vary at different scales (between paddocks, properties and catchments)?
- What options currently exist to overcome these constraints, and to what extent are they being adopted?
- Can overcoming rootzone constraints make significant improvement?
- What are the highest priorities for research and extension?

The plan will be developed by reviewing existing knowledge, by consulting industry and scientists by telephone, email, and at 6 regional workshops, and through economic modelling.

A workshop will be held at Camden on the 1st August 2002. The project is funded by HAL through the citrus and vegetable levies, and by the Grape and Wine R&D Corporation and the Land Technology Alliance partners. The project is due to report by December 30.

For further information contact Dr. Cameron Grant, the University of Adelaide, phone 08 8303 7404, email cameron.grant@adelaide.edu.au 

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WHEREVER WE GO, WE MAKE IT GROW

News in Brief

◆ **New conditions for irrigation incentives announced**

The New South Wales Rural Assistance Authority has released full details of the new conditions under which farmers can gain up to \$29,000 worth of financial support to improve their use of irrigation water.

The enhancement of the \$25 million scheme **will make the assistance available to more farmers around NSW who have completed recognised training in irrigation management** (such as WaterWise Course).

The scheme can now pay 80 per cent of the cost of preparing an Irrigation and Drainage Management Plan (IDMP) up to \$12,000, and 50 per cent of the cost of works and equipment recommended in the IDMP to improve water use efficiency up to \$15,000.

It also offers 50 percent of the cost of consultants or equipment to improve crop water use monitoring up to \$2000.

The assistance is available to all NSW commercial irrigation enterprises outside Land and Water Management Plan areas, which have their own incentive schemes. **There is no assets test on the new phase of the scheme.** It can now also assist irrigators who do not hold irrigation licences, for example farmers who irrigate from town water supplies.

For more details, phone the Rural Assistance Authority on 1800 678 593 or go to their website at www.raa.nsw.gov.au or contact your nearest WaterWise officer. 🌳

◆ **Apple moth's big appetite for citrus**

Light brown apple moth is a small insect that causes big problems in fruit crops throughout Australia by reducing yields, damaging fruit and causing restricted access to valuable fresh fruit export markets.

NSW Agriculture researcher, Jianhua Mo, leads a new three-year research project based at Yanco Agricultural Institute that aims to find new management options for light brown apple moth in southern Australia citrus orchards.

Light brown apple moth larvae feed under the stem and on unexposed areas of the fruit leaving the fruit scared and difficult to market. The larvae also bore into ripe fruit. The presence of larvae on fruit is a serious export concern. Dr. Mo's team will investigate factors contributing to build up of light brown apple moth infestations in citrus, effectiveness of the mating disruption technique and spray control options to combat the insect.

Use of soft sprays and oils to control light brown apple moth will be put to the test for long-term control. Timing of sprays will also be studied. Work had already started near Griffith, which involves testing the mating distribution technique to reduce moth populations.

The Horticulture Australia funded project is focusing on three key areas of research that will be conducted at on-farm trial sites in the Riverina and Sunraysia.

Contact: Jianhua Mo (Pron: Jian-wha) 02 6941 2537. 🌳

◆ **Western Flower Thrips & Stonefruit**

Graham Thwaite, Entomologist, NSW Agriculture, Orange



Western flower thrips (WFT) is a serious pest of vegetables and ornamentals which until 1993 was absent from NSW. It was first detected in the Dural district and has since spread north and south of Sydney. This introduced pest is also known to cause damage to deciduous fruit and information from Chile suggests that coloured peaches and nectarines are most susceptible to damage. Damage can occur at both the blossom stage (from egg laying) and as the fruit approaches maturity (from feeding). In the latter case damage appears as silver patches on the coloured fruit.

WFT has only recently (last season) been confirmed as damaging stonefruit in the Sydney Basin region of NSW. These relatively few confirmed instances of WFT damage are encouraging especially since WFT has been present in the area for more than 8 years.

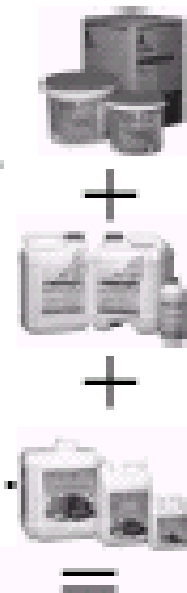
The AFSFGA has recently applied to the National Registration Authority for a limited use permit for one insecticide for control of WFT in Stonefruit in readiness for the 2002-2003 season.

Information on the success of this application should be known prior to the coming season.

Growers concerned about the presence of WFT in their orchard are urged to use sticky traps to capture adult thrips for identification. Traps should be placed in trees from the start of flowering through to harvest. WFT can also be present in understory or interrow vegetation, especially in broadleaved weeds. White Clover is a well known host of WFT. Therefore traps should also be placed (on stakes) just above the height of this understory vegetation.

WFT is difficult to identify and must be examined by an entomologist. Wrap the sticky traps in gladwrap (try not to crease the gladwrap when covering your traps) and contact your nearest District Horticulturist. 🌳

- **Less Insect Pest and Disease Problems on Fruit**
- **Better Fruit Colour & Higher Brix levels**
- **Greater Fruit Size and Better Uniformity**
- **Better Post Harvest & Storage Life for Fruit...**



With Acadian SSE, Aminogro, and Eco-Oil.

Acadian – A healthier plant at cell level, means overall quality and yield is improved both now and in the long term. Acadian contains naturally occurring growth promoters increasing cell division (size of the crop) and improving cell structure (a more uniform cell membrane is stronger and more able to resist disease).

Aminogro – The hard work is already done in breaking down nutrients for the plant. Aminogro takes 3-6 months to complete the microbial digestion process making sure the plant can absorb the nutrients immediately after application. Aminogro is an efficient trace mineral source and an excellent food source for beneficial soil microbes.

Acadian and Aminogro develop the plants' ability to resist stress conditions, either from pests and disease, soils low in organic matter, drought or herbicides. Growers have reported higher brix levels, larger and more uniform fruit, better colour and storage life and better insect and disease resistance after using OCP programs.



Eco-Oil – The advantage Eco-Oil has over current Miticides is that it has no withholding periods, no re-entry restrictions and maximum user safety. This means minimal spray protection gear, while maintaining maximum operator safety. Eco-Oil is perfect for use in and around public traffic areas and where produce handling and crop harvesting is labour intensive and costly.

Eco-Oil is an organically Certified, NRA Registered Miticide Insecticide for the control of Two Spotted Mites and Green Peach Aphid in various food and ornamental crops. It also has a physical mode of action meaning that insect pests like mites have a low level resistance potential to Eco-Oil. This allows growers to apply Eco-Oil on a more regular basis than the chemically active insecticides, without worrying about the complexities of insect resistance management strategies.

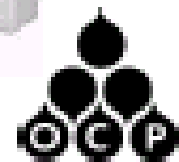
OCP manufactures and supplies a range of organically-certified products within Australia and overseas. Our products have an advantage over "other" products because they have no withholding periods (you can spray and pick the same day), no residues, and are safe to users and the environment. Our programs offer many benefits and we can give you specific advice suitable for your growing conditions.

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Organic Crop Protectants P/L



Registered Chemicals for use in Citrus Crops June 2002

Prepared by Sandra Hardy, and updated by Kevin Quinlan, Horticulturist in training, 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); control of pests (Table 2); control of diseases (Table 3); and to enhance fruit quality (Table 4). Chemical names have been used because there are too many products to list. This information has been sourced from Infopest (March 2002).

The tables are not comprehensive in that they do not list chemicals or use patterns for grapefruit or Kaffir lime 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.

Petroleum Spray Oils (PSO's) are widely used in Australian citrus orchards as part of this integrated approach to pest management.

Table 1: Registered products for postharvest treatment of citrus

Pest/Disease/Other	Active Constituent in Product	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons
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	✓			
Green Mould	guazatine	NA	✓			
	imazalil	NA	✓			
	imazalil sulfate	NA/NS	✓			
	thiabendazole	NA	✓			
Sour Rot	guazatine	NA	✓			
Light Brown Apple Moth	liquid hydrocarbons	NS	✓			
Mealybugs	liquid hydrocarbon	NS	✓			
Melanose	thiabendazole	NA	✓			

One of the most important things to remember with PSO's is that they need to be applied at high volumes to work successfully. PSO's 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 Autumn 2001 edition

OUP = Open Use Permit, Number (No) refers to the National Registration Authority (NRA) permit number. **Open Use Permits are normally issued for only a limited time and then need to be renewed. Therefore persons wishing to use a chemical in a manner approved under permit should obtain a copy of the relevant permit from the NRA and must read and comply with all the details, conditions and limitations on the permit.**



Table 2: 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 wetable 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 wetable sulfur	0-1 on some products NA 1	✓ ✓ ✓				
Citrus Butterflies	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 wetable 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 2: Registered products for pest control in citrus *continued.*

Pest	Active Ingredient	Withholding Period (WHP) days	Citrus	Oranges	Mandarins	Lemons	Limes
Lightbrown Apple Moth	azinphos-methyl carbaryl methomyl	14 3 2	✓ ✓ ✓				
Longtailed Mealybug	parathion-methyl aldicarb buprofezin	14 182 28	✓ ✓ ✓	✓ ✓	✓ ✓	✓	✓
Mediterranean Fruit Fly	dimethoate	7	✓	✓	✓	✓	✓
Nematodes	fenamiphos	NS	✓				
Orange Fruit Borer	carbaryl	3	✓				
Pink Wax Scale	carbaryl maldison petroleum oil paraffin oil	3 3 1 1	✓ ✓ ✓ ✓				
Purple Scale	maldison petroleum oil	3 1	✓ ✓				
Qld Fruit Fly	chlorpyrifos dimethoate fenthion	14 7 7	✓ ✓ ✓	✓	✓	✓	✓
Red Scale	azinphos methyl buprofezin chlorpyrifos maldison methidathion omethoate paraffin oil parathion-methyl petroleum oil	14 28 14 3 21 7 1 14 1	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓	✓	✓	✓
Rose Scale	petroleum oil	1	✓				
Rutherglen Bug	maldison	3	✓				
Scale insects	paraffin oil parathion-methyl	1 14	✓	✓		✓	
Small citrus butterfly	parathion-methyl	14	✓				
Snails	copper complex	1	✓				
Soft Brown Scale	azinphos-methyl maldison petroleum oil aldicarb parathion-methyl	14 3 1 182 14	✓ ✓ ✓ ✓ ✓	✓	✓		
Spined Citrus Bug	carbaryl diazinon endosulfan maldison	3 14 14 3	✓ ✓ ✓ ✓	✓	✓	✓	
Stubby Root Nematode	cadusafos	NA	✓				
Subterranean Termites	imidacloprid	NA	✓	non bearing trees only			
Thrips	dimethoate maldison	7 3	✓ ✓	✓	✓	✓	
Treehoppers	maldison	3	✓				
White Louse Scale	buprofezin lime Sulfur sulfur wetttable sulfur	28 NS 0-1 on some products 1	✓ ✓ ✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓
White Wax Scale	azinphos methyl carbaryl methidathion paraffin oil petroleum oil	14 3 21 1 1	✓ ✓ ✓ ✓ ✓				
Wingless Grasshopper	chlorpyrifos dimethoate	14 7	✓ ✓	✓	✓	✓	✓
Yellow Peach Moth	carbaryl	3	✓				
Yellow Scale	azinphos-methyl petroleum oil	14 1	✓ ✓				



Table 3: Registered products for disease control in citrus

Disease	Active Constituent in Product	Withholding period (WHP) days	Citrus	Oranges	Mandarins	Lemons
Black Spot	benomyl	NS	✓			
	copper sulfate (tribasic)	1	✓	✓		
	copper ammonium acetate	1	✓			
	copper hydroxide	1	✓			
	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
	mancozeb	0-14	✓			
	petroleum oil	1	✓			
	propineb	7	✓			
	zineb	7	✓			
	copper hydroxide + mancozeb	NA	✓			
	paraffin oil	1	✓			
Brown Rot (phytophthora)	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
Brown spot	copper oxychloride	1			✓	
	cuprous oxide	1			✓	
	iprodione	0			✓ nonbearing trees only	
Melanose	copper ammonium acetate	1	✓			
	copper oxychloride	1	✓			
	copper hydroxide	1	✓			
	cuprous oxide	1	✓			
	sulfur	NS/0	✓			
	copper sulfate (tribasic)	1	✓	✓		
Phytophthora Brown Rot	copper oxychloride	1	✓			
	cuprous oxide	1	✓			
Phytophthora Collar rot	copper oxychloride (OUP NO.48)	1	✓			
	copper hydroxide	1	✓			
	phosphorus acid	0/NA	✓			
	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	✓			

Table 4: Registered products for improving fruit quality in citrus

Pest/Disease/Other	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	NA		✓	✓	
Drop Prevention/Reduction	2,4-D-dma	NA		✓	✓	
Growth Improvement	gibberellic acid	NA/NS		✓		✓
Quality Improvement	gibberellic acid	NA		✓		✓
Rind quality maintenance	2,4-D-dma	NA		✓	✓	✓
	gibberellic acid	NA		✓	✓	✓
Thinning	ethephon	NA		✓	✓	
Creasing reduction	gibberellic acid	NA		✓		

Notes from Australian Citrus Growers

54th Annual Conference & Meeting Darwin 15th-19th April 2002

Lou Revelent, Citrus Technical Special, NSW, Griffith.

The Citrus Industry in the Northern Territory

Presented by Greg Owens, Senior Extension Officer - Darwin

The Northern Territory Citrus Industry is a very young and developing industry. There are currently 35 citrus growers in the top end of the Northern Territory, 22 in the Darwin Rural Area and 13 in the Katherine Region.

A recent survey has estimated that there are 70 000 trees planted. Main varieties are 30 000 grapefruit, 26 000 lemon, 12 000 lime and 1 000 other citrus, mainly mandarins. Most of the trees planted in the top end are still young, and over 80% of those planted are yet to come into production.

The main lemon cultivars grown are Lisbon and Eureka. For Grapefruit the Red Flesh cultivars are mainly grown with the most popular being Flame and Rio-red. The main root stocks for lemon in the region are Benton and Troyer while Swingle is the main root stock for grapefruit.

Citrus Opportunities in Australian Supply Performance in East Asian Markets

Presented by Graham Ferguson - Australian Business Limited

1. Citrus Export Market Intelligence System

The system comprises - Production and pre-season forecast reports

- Citrus plantings reports
- Australian export reports
- Overseas market reports
- Competitor reports
- Seasonality charts
- General export information

This system is currently being loaded onto the ACGI Website and will become available to all those approved to access it.

- Asian Buyer Survey of Australia's Fruit / Vegetable Supply Chain Performance

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.

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Australian Business Limited on behalf of the supermarket to Asia conducted a survey of food buyers across seven Asian countries.

Some of the findings of interest to the Citrus Industry were:

- Of the four sectors assessed the fruit and vegetable sector was the one that had the largest gap between Australia's performance and buyers expectations.
- The priorities for Asian fresh fruit and vegetable buyers are, in order; quality, price, market understanding, information flow and logistics.
- Australia's competitors were ranked excellent in quality, and they performed better than Australian Promotion, Marketing, and Information flow.
- There is a need for greater awareness of the importance of information.
- Fragmentation is a major weakness for Australia.

Some of the recommendations to the Australian fresh fruit and vegetables industry were:

- Consolidate supply to achieve critical mass in continuity of supply.
- Greater tactical use of the Australia Fresh brand.
- Increase communication at industry sector level.

Agri Food Globalisation and Asia

Presented by Judith Laffan - Agri Food Research

The key drivers of the scale and nature of Asian Agri-food demand growth trends over 2001-2010 will be:

1. Population Growth

Asia's total population was estimated to have reached about 3,351 million by 2000.

The World Bank has projected this would grow to about 3,727 million of the world's population by 2010. That is an increase of about 375 million. This significant population increase means a sizeable increase in food demand.

2. Change in Age Structure

Significant change in age structure of population will occur in some Asian countries over the coming decade, with higher proportion of aged citizens in the higher income economies. The composition of age brackets in the population will influence demand trends for food.

1. Urbanisation

Asia has been undergoing a steady trend of urbanisation for the past half century. Urban dwellers with better access to jobs and higher wages tend to demand larger amounts of food, and of better quality and greater variety.

2. Economic Growth and Per Capita Income Growth

The rate of economic growth and particular rise in per

capita income is a major driver of growth in per capita food demand.

The results of the study show that Asia's net demand for Agri-food will grow sizeably even if there is only low or moderate GDP growth over 2001 - 2010.

HuangLongBing and Asiatic Citrus Psyllid. Incursion and Post Establishment Management Strategies The Two Major Threats to the Australian Citrus Industry.

By Andrew Beattie - University of Western Sydney

The citrus disease HuangLongBing (citrus greening), the asiatic citrus psyllid, poses a serious threat to the Australian Citrus industry. The disease occurs in tropical and subtropical Asia and is spreading towards Australia. It can destroy orchards within five years of planting.

Complete control is impossible but it may be possible, through use of appropriate bio-rational management strategies, to maintain the productivity of orchards for fifteen years or more. The University of Western Sydney and CSIRO entomology are planning projects to improve incursion and post establishment management strategies for this disease.

Citrus Canker. How Serious is the Threat of Canker to the Australian Citrus Production.

By Patricia Barkley, National Citrus Improvement Manager, Auscitrus.

Citrus Canker originated in South East Asia and continues to increase its geographic range despite heightened quarantine regulations imposed by many countries to prevent its introduction. There have been more than 300 interceptions of citrus, mostly in baggage at Australian Airports, with 26 interceptions infected with Citrus Canker. Citrus Canker is a leaf spotting and rind blemish disease, but can cause defoliation, shoot die back and fruit drop. It can be a serious disease where rainfall and warm temperatures are frequent during periods of shoot emergence and development of young fruit. Living with Canker means quarantine and sanctions on fresh fruit exports.

Market Access for Australian Citrus into Asia. Phytosanitary Considerations.

By TK Lim - Bio Security Australia.

As countries begin to embrace the globalisation wheel, traditional trade barriers of quotas, tariffs and subsidies will ultimately be removed and countries may resort to the use of quarantine or food safety issues as technical barriers to impede trade. Thus the challenge confronting quarantine authorities is rather real and significant. They have to ensure that whatever measures employed to protect human, animal and plant life and health from pests and disease diseases, must not be used to impede international trade.

One guarantee that we can fall back on is the provisions of the World Trade Organisation (WTO). All members of the WTO are bound by international rights and obligations to consider market access issues. Members must subscribe to the rules and standards set out in the WTO's Agreement on the application of sanitary and phytosanitary measures.

National Citrus Research, Extension and Liaison Meeting.

The main focus of this meeting was a facilitated workshop to develop strategies for the implementation of the IAC Strategic Plan and various issues involved with the plan.

ACG Inc. 54th Annual Conference

Key presentations were made at the conference by Horticulture Australia Limited who launched the Citrus Industry Advisory Committee Strategic Investment Plan for 2002-2007.

The Plan's vision is that by 2007 there will be significantly increased overseas and domestic consumer demand for citrus products and growers will experience greater financial rewards for producing quality fruit in an environmentally sustainable manner.

NSW Citrus Development Strategy

NSW Agriculture and Arora consulting.
An overview of the plan was given pending its release by Government in May.

Berri Limited

Vic Johnson, Director of Operations, gave an overview of Berri's plans for the development of the Australian Citrus Juice Market.

Conference Business

Issues agreed, included

1. ACG requests Hal to implement minimum maturity standards for Taiwan of 8.1.
2. Conference confirms position on gene technology that no genetically modified organisms are used in the production of Australian citrus fruit.
3. Proposal that funding on plant health Australia to come from the R and D levy. That 0.2 cents is proposed to come from the \$2.00 .
4. ACG consider implementing a National Marketing and promotional levy on all citrus.
5. ACG allows the IAC to use marketing reserves held by Hal for export and domestic marketing and that the 75% marketing levy be used for both export and domestic.
6. ACG re-affirms the appointment of DNE as sole importers for the USA and current two importers for Korea.



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New law for keeping records of the pesticides you use - starts 31 July 2002.



Extracted from Environment Matters No.32 Pesticides. A full copy of this leaflet is available from the EPA website.

A new law for keeping records on pesticide applications has been finalised after considering public comments. The new law called the Pesticides Amendment (Records) Regulation, is part of the *Pesticides Act 1999* and begins on the 31st July 2002.

What does the new law say?

- If you use pesticides on your produce or farm, or in your business or occupation, then you must make a record of your pesticide use.
- The record needs to contain information about: who applied the pesticide; what was applied; when, how and where it was applied; what it was applied to, how much was applied, and, if the pesticide was applied outdoors by spray equipment, an estimate of wind speed and direction.
- The record must be made within 24 hours of use and kept for three years.
- EPA officers may check these records at any reasonable time and penalties may apply if the records have not been kept in accordance with the new law.

Which pesticides are included?

Pesticides include herbicides, fungicides, insecticides, fumigants, bactericides, rodenticides, baits, lures, repellents and pesticides used on animals to control external parasites.

Who does the law apply to?

Records must be kept by all people who use pesticides for commercial or occupational purposes such as on a farm, on produce, or as part of their job or business.

For example, this applies to farmers, market gardeners, green keepers, nursery operators, pest control operators, ground-rig operators, landlords, landscape gardeners, local councils and government agencies that use pesticides.

What sorts of pesticide applications have to be recorded?

Circumstances where you must make a record of using pesticides include:

- spraying crops, plants, or other produce

- spraying fallow land (i.e. spraying before planting or after harvesting)
- dipping fruit or vegetables
- baiting pests like rabbits, foxes, wild dogs, feral pigs etc.
- controlling pests in and around buildings (doesn't apply in farming or forestry)
- spraying places such as golf courses, bowling greens, ovals, playing fields or road verges
- controlling external parasites on livestock (except when using hand-held equipment).

In broadacre agricultural situations, records are not required where spot spraying of small isolated infestations is done using hand-held equipment.

Market gardeners and other horticulturalists have to make records for all pesticide applications, except for spot spraying in tree crops when using equipment that is both hand-held and hand-powered, and it is further than 20 metres to the nearest property boundary.

What do I have to record?

You must write down information about:

Who applied the pesticide?

Record the name, address and contact telephone numbers of the person who applied the pesticide. If a contractor or employee applied the pesticide, the contractor or employee needs to record their name as well as the name, address and contact details of their employer.

Who is the owner or occupier of the land/area being treated?

Record the name, address and contact details of the person in charge of the place where the pesticide was applied. This may be the owner of the land, a farm manager, a lessee or rental occupier.

When did you apply the pesticide?

You must record the date and the time you started and finished applying the pesticide.

What did you use?

You need to record the full product name of the pesticide that you used. A product name may include letters or numbers as part of its name and these must be recorded too.

Which crop or situation did you treat?

Name the crop, crops or situation for which the pesticide was used. You don't have to but it would be good practice to also record the disease or pest being targeted.

How did you apply the pesticide?

Name the equipment that you used e.g. mister, fogger, backpack, wiper, ground-rig, truck-mounted boom, tractor-mounted boomsprayer etc.

How much was used?

Record the total amount of pesticide mix you made up and used and the rate of application. The rate of application can be recorded in any way that you wish, provided that it is clear how much of the product was applied, either as concentrated formulation or ready-to-use mix, and the area it covered in the application (e.g. square metres or hectares).

Where did you apply the pesticide?

Record the property address and a delineation of the area where the pesticide was released. You could use a sketch or map of the property with blocks or paddocks marked on it to show the specific areas of the property that were treated for that job.

Alternatively, your record could refer to an area that is identified in a map of your property.

For agricultural or forestry applications you also need to write the order in which paddocks, areas or blocks were treated with pesticides if more than one was treated as part of the same job. For example, 'sprayed blocks 1, 5, 2 and 3, in that order'.

Weather—wind speed and direction?

If you are outdoors and spraying pesticide through the air you need to record an estimate of the wind strength and wind direction. For example, 'a light breeze was blowing from the north-east'.

You also need to record any significant weather changes during the application, e.g. when a change in weather conditions increases the risk of off-target movement of the pesticide.

If the pesticide you are using does not travel 'through the air' you do not need to record weather details e.g. dipping of fruit or vegetables after harvest or laying pest baits.

Do I have to record other weather details in addition to wind?

For some pesticides, the NRA has set directions on labels that restrict the use of the pesticide in certain weather conditions.

If the label of the pesticide you are using talks about weather details such as rainfall, temperature and/or humidity then you will need to record these too.

Do I need a special form?

No. You do not have to use a special recording form—any suitable format is fine. You may already keep records for quality assurance programs and these will be sufficient if they include all the requirements specified here.

When do I make the record?

You must make your record within 24 hours of applying the pesticide.

One record per job

If you are applying the same pesticide to different paddocks, crops or sections of roadside as part of the same job on the one day you only need to make one record and say which paddocks, crops or streets you treated.

Remember records need to be made within 24 hours of applying the pesticide. If your job goes for more than one day you would need to record the first day's application and then add more details to that record as your job continued. You would not need to make a completely new record for each new day.

Who makes the record?

It is the responsibility of the person applying the pesticide to make sure that an accurate record of that application has been made.

Can someone else make the record for me?

Yes. Someone else can write down the record for you but it is up to you, the pesticide user, to make sure the record is accurate.

How long do I keep the record?

Records must be kept for three years.

What happens if I do not comply?

Penalty notice fines for record keeping offences range from \$150 to \$400 for individuals and \$300 to \$800 for corporations. Maximum penalties for prosecutions are \$22,000 for individuals and \$44,000 for corporations.

More information

More information and assistance with the new law is available from your local EPA officer or by phoning Pollution Line on 131 555 (cost of a local call from anywhere in NSW) or from the EPA website: www.epa.nsw.gov.au/pesticides.



An afternoon seminar with Dr. Pete Timmer, International Citrus Pathologist

Andrew K. Miles, Queensland Department of Primary Industries, Fruit Pathology, Indooroopilly Research Centre, Brisbane

In October, the Queensland and Australian Citrus Industry was fortunate enough to host a visit from internationally revered citrus pathologist, Pete Timmer, and his wife Nancy.

Pete's academic career began at Michigan State University, where he received his Bachelor of Science in 1963. He soon completed a Ph.D. in 1969 from the University of California, Riverside. Pete then spent two years in Latin America as a Purdue Fellow, researching citrus viral and bacterial diseases. For 8 years Pete was based at the Texas A & I Citrus Centre in Weslaco, prior to moving to the Citrus Research & Education Centre, Florida, where he is presently continuing citrus research.

Currently, the majority of Pete's work deals with foliar fungal diseases of citrus. Much of his research deals with fungicides, and disease control modeling systems. The rest of Pete's research focuses on pathogen biology and epidemiology. In Florida, the major diseases Pete studies are scab, melanose, greasy spot, alternaria brown spot, and post bloom fruit drop.

The seminar Pete delivered to the Central Burnett region covered three major topics; use of copper-based protectants; management of alternaria brown spot; and greasy spot's similarity to black spot.

Use of copper-based protectants:

The Florida citrus industry has very few chemical disease control tools. Currently, the two major chemicals are copper-based protectants, and the strobilurin "Abound®" (Amistar®). Given that the strobilurin cannot be frequently used due to the risk of resistance development, copper products are relied on as the main disease control chemical. Whilst acceptable control can be achieved with copper protectants, the disadvantages of these products stated by Pete include fruit damage in the form of "stippling", darkening of blemish, and a lack of systemic activity.

The current consensus in Florida is that copper damage generally only occurs when copper is applied where temperatures are high, humidity is low, and cloud cover is zero. The exact causes of stippling and blemish-darkening are not clear, but Pete's belief is that it is a fruit surface temperature issue, and not so much an issue of residue levels, or copper formulation (ie. hydroxide vs oxychloride).

Pete does, however, believe that liquid copper formulations are usually less effective per kilogram of metallic copper (despite having more available copper) than powders and tend to be more phytotoxic. The consequence of these copper issues is that coppers can only be used, damage-free, for up to 2-2½ months after petal fall. According to Pete, growers are unfortunately forced to choose between copper damaged fruit, or brown spot damaged fruit in the warmer months of the season. The lack of systemic activity of copper protectants is a major issue in disease management, as these products cannot protect new growth tissue.

To illustrate this point, Pete explained that a doubling in fruit diameter results in a quadrupling of fruit surface area. Or, for a fruit 0.25 inches in diameter, the 0.2 square inches of rind that was protected becomes 0.8 square inches when the diameter doubles. Essentially only ¼ of the rind is then protected. It is this principle that makes it necessary to frequently apply protectants when disease pressure is high, even though the copper protectants have good sticking, and residue longevity characteristics.

A very interesting aspect of copper use in Florida outlined by Pete was their low-volume spray strategy. Typically, volumes of approximately 1200 - 1500 L/ha are used, and as low as 250 L/ha where specialised Curtec® sprayers are used. Unlike Australia, the Florida citrus operators use only air-blast sprayers. Pete's experimental work shows the differences in percent melanose-free fruit between an air-blast sprayer applying 2400 L/ha and a hand lance applying 9600 L/ha (Table 1.)

kgs per hectare of Kocide 101	% Melanose-free fruit	
	Hand Lance (9600 L/ha)	Air-Blast (2400 L/ha)
4.48	11.5 c	12.7 c
6.73	16.7 c	37.3 b
8.97	14.7 c	53.0 a
Control	12.9 c	

As can be seen in Table 1, the best disease control is achieved when using low volumes, and high concentrations of copper. The copper concentration made no difference when using the high volume application. Follow up studies in another season confirmed this, even when using up to 10 lb of Kocide 101® in a high volume application (Table 2.).

Pete highlighted several advantages to this system, including reduced product cost, water haulage cost, and

The three factors monitored in the prediction model are occurrence or absence of rain, hours of leaf wetness, and average daily temperatures. The effect of temperature and leaf wetness duration on *Alternaria* infection is demonstrated in Figure 1. A point-system is used that assigns higher daily point values where conditions are more favourable for *Alternaria* infection, and lower points where conditions are less favourable. These daily scores are accumulated, and once they reach a certain threshold value, a chemical application is recommended. The threshold values are assigned to individual orchards, to account for sites that have

kgs per hectare of Kocide 101	% Melanose-free fruit	
	Hand Lance (9600 L/ha)	Air-Blast (2400 L/ha)
4.48	-	61.9 a
6.73	35.9 c	67.2 a
8.97	46.7 bc	62.7 a
11.21	48.0 b	-
Control	4.4 d	-

increased disease control. To further optimise the copper spray programs, development of a computer based copper model is under way. The model uses parameters such as plant growth curves, rainfall, and residue persistence data. Gathering this kind of information allows for the estimation of the effective life span of a copper application, and thus predict when the next spray is required.

Alternaria brown spot management:

‘Minneola’ tangelo, and ‘Murcott’ mandarins are the two varieties of citrus most severely affected by brown spot in Florida. Infection occurs via resilient spores, released from lesions on mature leaves, including leaves that have fallen, anytime they are wetted. The current control strategy is based on copper protectants, and a strobilurin fungicide. Pete has developed a prediction model for brown spot, called the “Alter-Rater”, which uses environmental factors to time chemical application.

lesser risk of brown spot (drier, elevated sites with good air drainage), and those that have higher risk (lower elevation sites with poor air drainage and regular leaf wetting events). The susceptibility of the citrus variety in each orchard can also be included in the threshold value.

The “Alter-Rater” model is computer based, with weather conditions and accumulated point values accessible via the Internet. The outcome of using this system is that fewer sprays are used when conditions don’t favour brown spot, and more sprays are used when brown spot conditions are optimal. Pete has found that the system does not tend to reduce the overall number of sprays, the more efficient timing of sprays provides better disease control.

Pete highlighted several other brown spot control considerations. Firstly, research in Australia, Florida and Israel indicates that fruit are resistant to *Alternaria* by midsummer. Therefore no further control measures are required after this time, and protecting the flush is likely to be unnecessary. However, unlike in Florida, Australian growers continue to apply fungicides after this period. Several applications could be saved per season if fruit are shown to be truly resistant at this age. Secondly, because *Alternaria* produces a toxin that kills host cells (death visible on leaves within 24 hours, and fruit within 48 – 72 hours), nothing can be done to reverse *Alternaria* damage. It is for this reason that preventative strategies are being used.

One such strategy is to protect the major vegetative flush before bloom. It is best to spray this flush just prior to leaf maturity. Mature leaves with lesions form the major inoculum source of *Alternaria*. As explained previously, rapid growth overcomes the protective layer of a copper fungicide. Therefore it is best to protect the leaves when growth is slowing, and just prior to maturity. Once matured, the leaves are resistant to brown spot. The goal of this early spray is to reduce the build up of inoculum for the season to come.

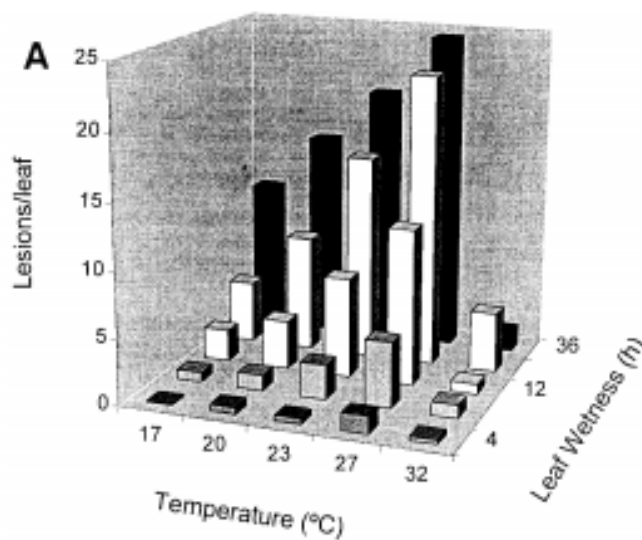


Figure 1. Effect of temperature and leaf wetness duration on *Alternaria* lesion development.

A third consideration is when to prune trees. The new flush that is stimulated by pruning will be susceptible to brown spot, making it best to prune trees when weather conditions don't favour *Alternaria* infection. Other points include,

- 1) the use of clean planting material. Pete has found that orchards planted clean can remain clean for up to 9 years, despite being in close proximity (~3 km) to brown spot affected orchards.
- 2) Pruning to increase tree ventilation, allowing more rapid leaf drying,
- 3) avoiding excessive nitrogen and watering which stimulate excessive flushing, and
- 4) planting trees in areas with good air drainage, and low moisture. As for the future of brown spot disease control, Pete believes the likely solution will be found by breeding resistant varieties.

Greasy spot – a very similar disease to black spot

Like black spot (*Guignardia citricarpa*), greasy spot (*Mycosphaerella citri*) can affect both leaves and fruit of susceptible hosts, especially grapefruit and lemon. This slow-developing disease takes approximately 6 months to develop symptoms, and results in leaf drop, reduced tree vigour, and yield loss. Unlike brown spot, fruit and leaves never appear to become resistant to the pathogen. The important similarity of greasy spot to black spot, is that infection occurs via spores released from leaf litter. Some current orchard practices have led to an environment that greatly favours spore production. For example, the removal of weeds and other ground vegetation allows clear passage of spores from the litter to the fresh leaves and fruit, and irrigating 3 days a week with ground sprinklers gives optimal stimulation of spore release. This known, several cultural practices theoretically could be useful aids in disease control.

These include:

1. Leaf litter removal – would need to be thorough, and perhaps most effective where a single leaf drop event is generally observed.
2. Mulching over leaf litter.
3. Shredding leaf litter to enhance decomposition.
4. Daily irrigation to enhance decomposition.
5. Spraying leaf litter with urea to enhance decomposition.

The goal of these practices would be to reduce the number of spores being released into the atmosphere. This at first seems like an effective approach, but it is confounded by data that shows that the number of

spores is not directly related to the amount of disease that is observed. What has been found to be closely related to the amount of disease are the environmental conditions. When environmental conditions are ideal for the pathogen, fewer spores are required for infection and disease development. Conversely, when the environmental conditions are not ideal, less disease can be observed regardless of high numbers of spores. The consequence of this is that in order to get reduced disease from these types of practices, spore numbers may need to be reduced by perhaps 90-95%, and not 50% for example. This would also impact on the timing of litter removal, which would best be done prior to conditions favouring disease, so the spore load is minimised.

The complete effectiveness of these methods is not yet fully known, but some success has been reported. All these practices would require an economic analysis, so studies looking at yield would be required to determine the practicality of such methods. It may be found that such activities used in conjunction with traditional management strategies are successful. It should be noted that Pete hasn't found spraying leaf litter with registered fungicides to be effective for disease control.

A long-term solution to black spot control is most likely to come from resistant varieties. The difficulty is that unlike brown spot susceptibility which is a single gene, black spot susceptibility is a more complex multi-gene interaction. Resistance genes are most likely to be found outside citrus, which then involves the controversy surrounding genetically modified produce.


More information about Pete's research and modelling systems can be found on his website:

<http://www.lal.ufl.edu/timmer/>

Other useful websites:

University of Florida Institute of Food and Agricultural Sciences: <http://edis.ifas.ufl.edu>

The Curtec® Spray System:
<http://www.bei-inc.com/Curtec01.htm>

University of California Statewide Integrated Pest Management Project: <http://www.ipm.ucdavis.edu/PMG/selectnewpest.citrus.html> 



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The Fruit Industry of New South Wales

- a report from 1934 - PART 2

W.L.G. Brereton, Chief Fruit Instructor 30th January 1934

Figs: This fruit is grown for dessert, drying, canning and jam making purposes.

Passionfruit: The production of the Passionfruit extends over a fairly wide area. Fruit of the highest quality is produced and commands satisfactory prices. Enquiries are being received from time to time from overseas countries for both fruit and pulp, and there appears to be reason to believe that ere land an export trade will be developed.

The principal established fruit districts of New South Wales are given below with some of the principal townships mentioned, so that their position can be more easily located on the map, and the meteorological notes can be applied.

The coastal area east of the Dividing Range from Tweed River on the Queensland border southward to the Manning River, including such centres as Murwillumbah, Mullumbilly, Byron Bay, Nimbin, Lismore, Grafton, Coffs Harbour, Port Macquarie and Taree, in this area the Banana is extensively grown. Small areas of other tropical fruits such as Pineapple, Mango, Pawpaw, Avocado are also to be found. Areas of Passionfruit (*Passiflora edulis*) are being increased rapidly, also areas of the Australian Nut (*Macadamia ternifolia*).

On the coastal area further south, east of the Dividing Range, embracing the Manning River and the Hunter River and its tributaries, Oranges are grown and to a lesser extent early Peaches and Japanese Plums for dessert purposes. This includes such centres as Dungog, Gresford, Paterson, Maitland and Singleton.

Oranges, Mandarins and Lemons are extensively grown along the coastal area from Dora Creek to Gosford and Mangrove Mountain, also along Hawkesbury River, including such centres as Lower Portland, Wisemans Ferry, St Albans (McDonald River) and Windsor. Besides oranges some early stone fruits (Peaches and Jap Plums are also grown for dessert purposes).

Oranges, Lemons, Mandarins, Peaches and Japanese Plums are grown on the Kurrajong and Hills district including such centres as Dural, Castle Hill, Glenorie, Galston and Kenthurst.

About Parramatta, North Ryde, Carlingford, Penrith, Orchard Hills, Liverpool, Camden, Canley Vale, Fairfield, Campbelltown, early dessert Peaches and Japanese Plums are grown, and at Camden, Canley Vale, Liverpool, Fairfield, Campbelltown dessert grapes are extensively grown.

On the Highlands of Penrose and Tallong, Apples and Pears are grown.

The principal Tableland fruit growing districts are Tenterfield, Uralla, Kentucky, Millthorpe, Orange, Borenore, Goulburn, Batlow, where Apples, Pears, European Plums and Cherries are grown.

On the Slopes west of the Dividing Range the principal fruit growing centres are Albury, Young, Molong, Yass and Bathurst. In these districts Apples, Pears, Plums and Peaches are grown, and in the Albury, Young and Molong districts Table Grapes are grown, and at Young Cherries and Prunes are extensively grown.

In the vicinity of Blackheath on the Blue Mountains and at Hartley on the western slope of the Blue Mountains Apples are produced.

On the Murrumbidgee Irrigation Area including the centres of Yanco, Leeton, Griffith and Yenda, the following fruits are produced – Apricots for drying, canning and fresh fruit market. Peaches for canning, Prunes for drying, Sultanas, Currants and Muscatel Grapes for drying, also late Table Grapes and Wine Grapes.

The principal varieties of the various kinds of fruit grown in New South Wales are as follows:-

Apples (*Pyrus malus* and Pears (*Pyrus communis*): Chiefly grown on our Tablelands and the Western Slopes of the Dividing Range.

Apples – Gravenstein, Jonathan, Delicious, Granny Smith, Democrat.

Pears – Williams Bon Chretien. Packhams Triumph, Josephine de Malines, Beurre Bosc, Winter Nelis, Winter Cole.

Peaches (*Prunus persica*): Chiefly grown on the coastal belt. Governor Rawson, Edward Vil, Watts Early, Braddock.

Early Peaches grown in the coastal belt and further west – Wiggins, Carman, Aunt Becky.

Early Peaches grown on the Tablelands and western slopes of the Dividing Range – Blackburn, Elberta, J.H.Hale.

Mid-season Peaches chiefly grown on the slopes west of the Dividing Range – Blackburn, Elberta, J.H. Hale.

Canning Peaches chiefly grown in the Irrigation Areas of Yanco, Leeton, Griffith and Yenda – varieties Pullars Cling, Golden Queen, Phillips Cling and Palora.

Japanese Plums (*Prunus domestica*): The Japanese Plums are chiefly grown on the coastal belt, but also to a smaller extent on the slopes west of the Dividing Range. The chief varieties cultivated are Shiro, Santa Rosa, Burbank, Japanese Sultan, Chalco, Wickson, Satauma.



European Plums (*Prunus domestica*): Chiefly grown on the Tablelands and slopes west of the Dividing Range. Formerly a great number of varieties were cultivated, but now the number has been practically reduced to the following – Angelina Burdette, Ponds, Grand Duke, President.

In the Young district and on the Leeton-Yanco and Griffith-Yenda Irrigation Areas, large quantities of the Prune d’Agen and Robe de Sergeant Prunes are grown and dried.

Apricots (*Prunus armeniaca*): Early varieties such as Newcastle and Red Masculine are grown in the coastal belt. On the slopes west of the Dividing Range a better type of Apricot is grown such as Morrpark, Hemskirke, Alsace, Blenheim and Trevatt.

On the Yanco-Leeton and Griffith-Yenda Irrigation Areas the Trevatt Apricot is almost exclusively grown for drying and canning.

Cherries (*Prunus avium*): The principal centres where cherries are produced are Orange, Armidale, Uralla and Tenterfield. Goulburn on the Tablelands and at Young on the slopes west of the Dividing Range. The main varieties are Early Lyons, Eagles Seedling, Burgdorff, Bigarreau Napoleon, Florence, St Margaret.

Grapes (*Vitis vinifera*): Principal varieties Black Hamburgh, Snows Black Muscat, Doradillo, Waltham Cross, Purple Cornichon, Ohanez or Daria, Gordo Blanco, and for drying Sultana, Zante Currant, Gordo Blanco and Waltham Cross.

Oranges (*Citrus sinensis*): Formerly a great many varieties were grown such as St. Michael, Mediterranean Sweet, White Siletta, Homasassa, Joppa and budded or grafted selected seedlings often called the Parramatta.

In the coastal areas on the Hunter River and its tributaries and further north areas of seedling orange trees still can be found, but the whole trend of the later plantings both on the coast and inland has been to reduce

the varieties to two – Washington Navel and Late Valencia.

Of **Mandarins (*Citrus nobilis*)**, the Emperor was the most largely planted. The Thorney was also grown. However, the area under mandarins is on the decline.

The Libson and Eureka (locally called Sweet Rind) are the principal **Lemons (*Citrus Limonia*)** grown.

The area under **Grapefruit (*Citrus Paradisi*)** is comparatively small. Marsh variety has been planted mostly in the past, but this Department has introduced more suitable varieties which are now being distributed.

Strawberries (*Fragaria*): Fendalcino, Creswell Seedling and Ettersburg 89 are the principal varieties grown.

Bananas (*Musa cavendishii*) are practically the only variety grown in New South Wales.

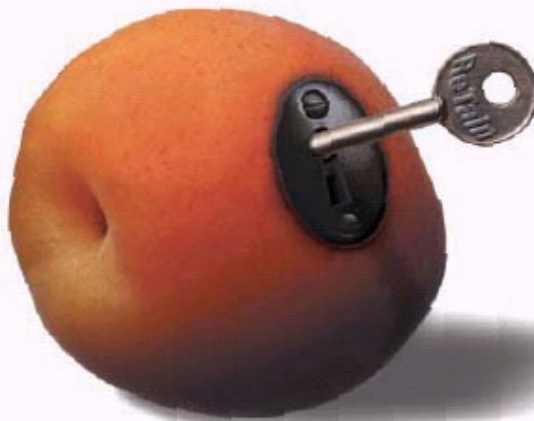
Pineapples (*Anaassa*): The principal variety grown is the Smooth-leaved Cayenne, but Queen and Ripely Queen are also grown to a lesser extent.



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What's on

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

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Phone: 08 8262 2077 Fax: 08 8359 4552
Mobile: 0418 839 836 e-mail: afsfga@bigpond.com

- ◆ **12 July 2002. 8.30-4.30 AFSFGA AGM & Inaugural Stone Fruit Levy Payers Meeting**
- ◆ **27 July 2002. Information Day for Cut flower growers: Crop Nutrition & Soil Management**

Starts 1pm at the Dural Country Club, 662a Old Northern Road, Dural. For more information contact Bettina Gollnow 02 4640 6437 or Alan Merriman 02 4739 5141 or 0408 267728.

- ◆ **29 September to 2 October 2002 Australian Society of Horticultural Science Inc - Horticultural Conference, University of Sydney**

University Scientists will be gathering at Sydney University in late September to exchange reports on recent advances in research and technology in the field of horticulture.

- ◆ **October 15-17, Australian National Field Days, Orange. Phone: 02 6362 1588.**

What's new

New Website for Native Foods

A new website that supports the development of the Australian Native Food Industry has recently been launched.



The website is produced for, about, and by the Australian Native Plant Food Industry and is the Industry's national forum for development issues and an information resource for all those interested in the Native Food Industry.

It provides a profile of the Industry, covering the main crops and production regions, as well as the associations and cooperatives; processors and marketers; and support services active in the Industry - Go to - www.nativecrops.com.au/industry

What's New - Publications ~~

on the NSW Agriculture Website:

Apple Varieties: Agfact H4.1.12, 2002 go to <http://www.agric.nsw.gov.au/reader/11115>

Directory of Beekeeping Services, 2002 go to <http://www.agric.nsw.gov.au/reader/2002>



Background

The Hunter Farmer of the Year Awards are aimed at recognising excellence in a broad range of agricultural activities in the Hunter region.

These awards are open to all agricultural enterprises in the region from the Hawkesbury River to Gloucester and Great Lakes Shires and west to the limits of the Hunter catchment at Cassilis.

There are a total of 16 awards to be presented with sponsors contributing approximately \$20,000 worth of prizes.

Five separate industry categories (Beef, Dairy, Viticulture, Poultry and Open) will be judged to select five finalists who will then be revisited to select the overall Hunter Farmer of the Year.

The judging criteria is best described by the entry forms which aim to be very broad and consider the many and varying factors which are important to successful farming.

Major sections include farm productivity, business management, environmental sustainability, marketing and quality assurance, family and labour issues, industry and community involvement. Commendation awards will be presented for many of these criteria.

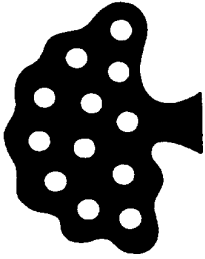
Interested groups are invited to nominate farmers to enter the awards. Individuals can enter themselves or nominate other farmers.

Entry forms and information can be downloaded from the website www.tocal.com - for further information contact:

Neil Griffiths, NSW Agriculture, 02 4939 8888
Entries close 2nd August, 2002.



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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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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.