

COASTAL FRUITGROWERS' NEWSLETTER

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No. 72 Winter 2009

Dear Growers

Welcome to the very late Winter edition of the Newsletter, and if you were wondering, there was no Autumn edition published.

As mentioned in the last issue (Christmas 2008) the Newsletter, owing to financial reasons, has now gone completely electronic. This unfortunately has meant some growers who have no computer access will no longer receive a printed copy – sorry!

The NSW Department of Primary Industries has also had a name change (see page 9 for details) — we are now Industry & Investment NSW — so where you see I&I NSW – that's us! Our email addresses have also changed, just replace the "dpi" with "industry".

For stonefruit growers there is an important notice on the control of flying foxes for this season – go to page 11.

I've run out of room so for more information on what's in this issue – take a look inside.

Happy reading

Sandra Hardy



Seminar for North Coast citrus growers Copper sprays & assessing spray coverage

When: Tuesday 25 August, 9.30 am – 1 pm

Where: Andrew Tully's farm, 168 Lindendale Road,
Wollongbar

RSVP by Friday 21 August to Andrew Mason (02) 6687 1540
or email andrew.mason2@gmail.com

For further information contact Andrew, Phillip Wilk
0411 139 567 or Sandra Hardy 0412 425 730.



Industry &
Investment

Coastal Fruitgrowers' Newsletter
Edited by Sandra Hardy
Design & Layout – Cathryn McMaster

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 Industry and Investment NSW 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 Industry and Investment NSW.

Dareton citrus field day report

Michael Treeby, Research Horticulturalist, I&I NSW, Dareton.

On the 16 June a CITTgroup field day was held at the Dareton Primary Industries Institute. This is a summary of the main presentations from that event.

Variety improvement

A key activity at Dareton over the past 15 years has been the evaluation of a wide range of citrus types, both from local selection and introductions to Australia. A trial was established in 1992 of 25 selections of early, mid-season and late navel oranges. Yield, fruit size and quality were collected from the trial between 1996 and 2003. High performing selections, under these trial conditions, were: Navelina in the early category, Atwood and Fisher navels in the mid season and Autumn Gold and Clark navels in the later part of the season. The trial provides an on-going resource and has also been used for assessment of albedo breakdown susceptibility, fruit growth rate modelling and is currently part of phenology studies to improve the timing of management practices on navel oranges.



Inspection and taste testing of new public access citrus

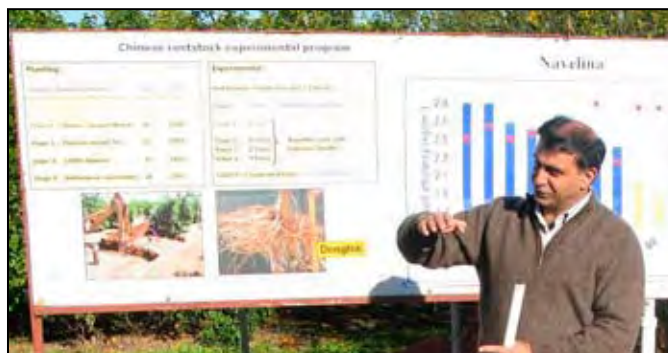
New public-access citrus varieties were first established as trees and grafts at Dareton in 2005 and 2006, and have begun cropping. There are currently 11 public-access and 20 private (PBR) citrus varieties included in a national evaluation program coordinated by I&I NSW. Evaluation sites are also in South Australia, Western Australia, Queensland and the Riverina of NSW. Varieties enter the program as they are released from plant quarantine and 27 of the 31 are established in the field with 3 to be planted in spring 2009 and the final variety to be

propagated by early 2010. Varieties shown at the farm walk included satsuma mandarin types and 3 new clementines – Orogrande, Sidi Aissa and Nour. The early maturing Primosole mandarin from Italy granulated for a second year and does not appear suited to the Sunraysia climate. Bintangcheng processing orange from China is thorny as a young tree but may suit mechanical harvesting and provide fresh juice for blending with late held Valencia or mid season oranges such as Salustiana.

Five hectares of navel varieties have been established at Dareton since 2000. The purpose is to provide revenue and a future trial resource for the station. A range of rootstocks, as single rows, have been included in these plantings to assess their performance in comparison to the standard Troyer and Carrizo citranges. The performance of C35 and C32 citranges are being compared to Troyer citrange in a Hockney and Atwood navel block planted in 2002 and 2004 respectively. The dwarfing effect of C35 is most prominent in the Hockney block, and this effect is most probably related to the Hockney budline used carrying a viriod and the age of the planting. Yield and packout data are being collected with C32 and Troyer citrange in the Hockney block having a similar cumulative yield over seasons 2007 and 2008. C35 citrange had approximately 20% less yield which was related to the smaller tree size.

Rootstocks

A range of Chinese rootstocks is being evaluated in replicated trials at Dareton with respect to their influence on scion yields, fruit size distribution, internal fruit quality, scion and stock compatibility, tree growth and



Tahir Khurshid (Research Horticulturalist) describing the results from a recently completed trial on Chinese rootstocks at I&I NSW, Dareton. Participants inspected the navel and mandarin trees growing on some of the promising rootstocks.

salt tolerance. The aim is to identify the better performing rootstocks in Sunraysia's deep sandy loam soil conditions. The next stage will involve evaluation in heavier (clay) soils.

Different rootstock types included trifoliata types, mandarin, erythrosa, junos, sour orange and standard Australian rootstocks. The trees were planted at 5 different stages in 1997, 1999, 2001, 2003 and 2005. The rootstocks were budded to sweet oranges (Valencia, Navelina and Lane late), Imperial mandarin, and Eureka lemons. The results from the intensive data collection over 5 years on the trees planted in 1997 and 1999 suggested that trees on some rootstocks performed better than trees grafted to the Australian standard rootstocks. Sweet orange yield and quality is superior on Donghai, Tanghe, Houpi, Anjiang hongju, Zhoupi jiangnan and Caoshi xiangju, and Imperial mandarin has good graft unions and is producing high yields of good quality fruit on Nanju and Anjiang hongju.

Kaolin clay

Some four year old navel, one year old navel and one year old Imperial mandarin trees were sprayed with two kaolin clay products, Surround® and Screen®, in early December, early January and early February 2009. The first application was at the full rate whilst the second and third applications were at reduced rates as per the labels' recommendations. The manufacturing process is different for each product and this is reflected in the appearance of the trees following application; trees sprayed with Surround® appear whiter than trees sprayed with Screen®, however, the latter is less susceptible to rubbing off.

New growth on the sprayed trees was very visible on a white background. The white background of the sprayed trees provides an impression of extra growth, but this is unfounded because closer inspection of the unsprayed trees indicated a similar level of new growth. This highlights the importance of having unsprayed trees directly beside sprayed trees and carefully assessing any new growth. Growers attending the field day indicated that they thought they saw responses when they used kaolin clay products (reduced sunburn on mandarins and improved growth of young trees) with only two or three applications at the full rate.

Leaf temperatures were measured during a 45°C day in February. The leaf temperatures on the sprayed leaves were about 1–2°C less than the unsprayed leaves. The data was highly variable and it was later discovered that this

variability arose from a significant temperature difference associated with leaf age; young leaves were significantly cooler than mature leaves. The leaf temperature measurements need to be conducted this season in late spring/early summer on leaves of a similar age, possibly selecting only spring flush leaves.

The spray trials will be repeated again during the 2009–2010 season. A sticker wetter will be used to try and improve evenness of coverage and the spray rates and frequencies will be reassessed in consultation with the products' manufacturers.

Fertigation

A young planting of Atwood navel oranges on citrange is being used to investigate the impact of irrigation and fertiliser supply strategies currently being used in modern fertigation systems. Irrigations are being scheduled using tensiometer readings and weather forecasts, and water is being supplied using either a conventional approach to drip irrigation (i.e. irrigated every 3–4 days), or irrigated daily as either a continuous supply of water or in short pulses throughout the day. The aim is to supply the same amount of water in each of the three approaches, but be able to identify whether there is a benefit in one approach over the others.

Similarly, the impact of daily applications of fertiliser via the irrigation water (i.e. fertigation) are being compared to the conventional approach to fertiliser supply (viz. large amounts supplied every 3–4 months). Again, the same amounts are supplied in each approach, but the benefit or otherwise of supplying small amounts of fertiliser daily with some regard to demand is being quantified.

A long-term fertigation trial site is being established to investigate the fertigation needs of navel orange trees on different rootstocks. The design of the trial will be based on the outcomes of the Atwood navel orange trial referred to above, and on glasshouse experiments that are quantifying the response of citrus seedling rootstocks to nutrient supply.



Aspects to consider when selecting a soil moisture sensor

Jeremy Giddings, Irrigation Officer, I&I NSW, Dareton.

Extracted from Citrep, the newsletter of the Murray Valley Citrus Board, Issue 57, June 2009

Demand for soil moisture monitoring tools is increasing with the growing need to conserve water.

A wide range of tools is available, all with their advantages and disadvantages. The following aspects should be considered prior to selecting a soil moisture-monitoring tool.

After-sales service and agronomy

After-sales service is the most important aspect to consider when selecting a soil moisture sensor. All scheduling systems will work and give similar results if correctly installed and calibrated etc. It is important that service and support are available locally to make them work for you. This should include advice on location of sensors, installation, calibration and data interpretation. Service and support are just as important, if not more important than good hardware and software.

Data presentation

If a computer is required, then the software must provide information that growers will find easy to understand. Growers are often highly frustrated by software programs that are cumbersome and confusing. Basic computer knowledge should be all that is needed to make informed decisions on when and how much to irrigate.

Case studies / examples / history

Often the best person to talk to about a particular product is another person using that product. With so many options becoming available, this is particularly the case for soil moisture monitoring tools. Suppliers should be prepared to put you in contact with growers using their products. If this is not possible, contact your local Industry & Investment NSW office which should be able to provide you with grower examples as well as independent advice. New products are becoming available as various companies identify increased demand for this service. Products that have a proven history of success and are available from agents who have

a history of providing suitable backup and support are most likely to be successful for you.

Level of detail required

Growers using drip irrigation in hot dry regions will require detailed information on soil moisture levels. In this situation, continuously logged systems are preferred. Where irrigation is applied less frequently (such as orchards irrigated with full cover systems) manually read equipment can be adopted more successfully.

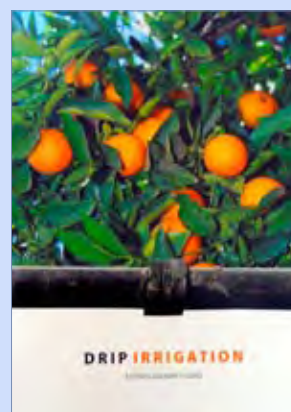
Time input available

Soil moisture readings should ideally be made before and after each irrigation, with at least one reading in between. For drip irrigation systems in hot regions where daily irrigations are possible, this means a large time commitment in the peak of summer, if you are using manually logged systems. Again, for this reason, continuously logged systems are preferred if you are pressed for time or labour.

Drip Irrigation - a citrus grower's guide

This 120 page booklet includes information on water quality, designing drip systems, irrigation scheduling, fertigation, system monitoring and maintenance, soil management, the economics of drip and grower case studies.

Available from the I&I NSW bookstore phone 1800 028 374. Cost \$22 and \$8 p&h.



Citrus gall wasp technical forum report



Sandra Hardy and Andrew Creek, I&I NSW.

Extracted from the final report of the technical forum.

Introduction

On the 5th May 2009, a technical working group of fifteen citrus industry people met at the Dareton Agricultural Research and Advisory Station to discuss the issue of citrus gall wasp as an emerging pest in the southern citrus growing regions of Australia. The forum was funded from NSW Central Coast CITTgroup and National CITTgroup Horticulture Australia project funds.

The key purpose of the forum was to develop appropriate management strategies for citrus gall wasp in the southern citrus production regions, specifically the Riverina and Sunraysia areas. Forum participants included leading Australian citrus entomologists with experience in managing citrus gall wasp, CITTgroup coordinators, I&I NSW extension officers, key citrus IPM consultants, the Auscitrus manager and regional grower representatives. The forum format included a technical presentation on citrus gall wasp, reports on regional experiences of the pest, a field trip to an orchard to inspect citrus gall wasp damage and an open forum to develop suitable pest management strategies for the citrus industry.

The pest

Citrus gall wasp, *Bruchophagus fellis*, is a native pest of the Australian finger lime (*Citrus australasica*). It has traditionally been a pest of citrus in the growing regions of Queensland and northern NSW, but is also found in the central and northern citrus growing regions of NSW. In the last decade it has been found in isolated pockets in the southern growing regions of the Sunraysia and Riverland areas and more recently has been identified in backyard trees in the city of Griffith. All varieties can be attacked but lemons, grapefruit and some rootstocks (e.g. Rough lemon, *Troyer citrange*) are most susceptible.

Citrus gall wasp infests the young flush spring growth of citrus causing woody galls to form around the developing



larva. Heavily infested trees can be covered with galls which can reduce crop yield and cause branch dieback.

The adult gall wasps lay their eggs in spring (October to mid November) under the fresh bark of the spring flush. The larvae emerge 2–4 weeks later and burrow into the stem where they feed (most eggs are hatched by early December). By late December, woody tissue begins to form around the larva, continuing to swell and develop the characteristic woody gall.

The larvae go through four development stages which last between 9–10 months. Stage 1 lasts many months from spring to the following winter. Stages 2, 3 and 4 are relatively short lived, occurring between mid-July to September. The larvae then pupate for 2–3 weeks in early spring before the adults emerge. Wasp emergence is closely linked with tree phenology and associated with the spring flush growth. The adults can mate immediately and only live for a few days (up to a week in cooler temperatures). The female can lay up to 100 eggs. Citrus gall wasp has a 12 month life cycle producing only one generation per year.

Gall wasp parasitoids

Two parasitic wasps are important natural enemies of citrus gall wasp and where present should eventually keep the pest in check.

Megastigmus brevivalvus and *M. trisulcus* are the natural predators of citrus gall wasp. The parasitic wasps insert their eggs directly into the gall wasp egg where they slowly develop in the gall wasp larva, eventually killing it. The adult parasitoids emerge over a 2 week period about 2½ – 3 weeks after gall wasp emergence.

Ideally parasitoids should be released close to galls in small lots, or as a dribble release over a longer period, for between 3–5 seasons. Eventually the galls should decrease in number and become smaller in size, 5–6 years after successful parasite release and establishment. Assessment of release success is critical, but previous experience in QLD has shown the parasitoids usually do well where ever the gall wasp thrives.

Parasitoids are only available commercially from Bugs for Bugs in Mundabbera. Currently parasitoid collection sites are limited to properties in Queensland infested with gall wasp and need to be sourced annually. They are normally available between late October and early November.

The correct timing of parasitoid release (3–4 weeks after gall wasp emergence) is critical and in some regions will not match the parasitoid availability window.

Monitoring gall wasp

On farm monitoring for citrus gall wasp should begin in mid September/early October. A suggested monitoring protocol is:

- Check 5 sites (branches) per tree and monitor 20 trees/block.
- Record the presence or absence of galls and the size of galls (small/med/large).
- Control action is warranted if there is greater than a 30% presence of galls.

Gall wasp management in commercial orchards

In order to successfully manage citrus gall wasp it is critical to know when gall wasp emergence occurs on your property. Start checking infested trees regularly in early spring for either the wasp or presence of exit holes in the galls.

• Parasitoids:

Release parasitoids into infested blocks and close to galls, 3–4 weeks after gall wasp emergence is completed. Parasitoid release should be continued for at least 3–5 years.



• Cultural practices:

- To reduce the amount of spring flush growth suitable for wasp oviposition (egg laying):
 - avoid the production of excessive spring flush growth on infested trees through over-fertilisation.
 - undertake hedging/pruning/skirting immediately after gall wasp emergence is completed.
- To reduce gall wasp populations — prune off infected shoots 1 month prior to wasp emergence (i.e. before September).

• Chemical control:

If chemical control is required — currently the only chemical registered for control is methidathion. Apply methidathion (Supracide®) 4 weeks after gall wasp emergence is completed to the spring flush growth of infested trees. Do not apply in blocks where parasitoids are being released. Spray highly susceptible varieties (i.e. lemons/grapefruit) adjacent to infested blocks to reduce the spread of gall wasp in the orchard.

National citrus plantings database 2008 report



Extracted from the final report

The project, CT07055, was undertaken by SunRISE 21 Inc. to produce 2008 planting statistics and 2003 to 2008 planting trends information for the Australian citrus industry. Planting information is critical for forecasting crop production, which forms the basis for industry stakeholders to make informed management and planning decisions for marketing, trade policy, research and development, and capital investment.

The plantings information is derived from mapping of citrus, which commenced in 2003, from digital, scale accurate, aerial photography (orthophoto imagery).

The project was funded from the Citrus Research and Development Levy and could not have been achieved without the input of Riverina Citrus, the Murray Valley Citrus Board, the South Australian Citrus Industry Development Board, Queensland Citrus Growers Inc., the Department of Agriculture and Food Western Australia and the Department of Primary Industry, Fisheries and Mines Northern Territory.

The project involved survey returns from over 1,500 citrus growers across Australia whose time and

consideration in filling out 'yet another' survey form was essential to the project's validity.

The 2008 citrus mapping comprises 27,627 hectares (12,047,779 trees) from 1,957 citrus properties. The mapping databases provide information on varieties, rootstocks, bearing and non-bearing plantings, inter-plantings, irrigation methods and property sizes.

Analysis of the 2003 and 2008 citrus mapping identified change over a five year period that encompassed drought and low water allocations, containment of a citrus canker outbreak in Queensland, globalisation of markets and a rigorous trading environment. In this period, over 300 citrus growers (13%) exited the citrus industry. And while at least 2,075 hectares (7%) of Australia's citrus went out of production, 4,066 hectares of new or reworked citrus is soon to come into production.

Summary

A national total of 27,627 hectares (an estimated 12,047,779 trees) of citrus has been mapped; with 95% of this area recorded to the variety level.

Table 1. National citrus categories

Category	Hectares		Trees	
	2008	Change since 2003	2008	Change since 2003
Grapefruit	857	+113	354,147	+55,617
Lemon	1,045	-298	425,554	-136,557
Lime	83	-63	37,506	-28,681
Mandarin	4,873	-357	2,315,732	-53,025
Navel	11,769	-280	5,271,639	+57,438
Orange	532	+259	324,758	+159,677
Pummelo	22	+4	7,387	+1,578
Tangelo	338	-4	173,092	+622
Valencia	8,108	-1,447	3,137,965	-475,950
Total	27,627	-2,074	12,047,779	-419,280

Note that 5% of citrus categories are unknown and the above figures are extrapolated to account for this 5%.

Table 2. Citrus hectares per region

Region	Hectares			Tree estimate	
	2008	% of total	Change since 2003	2008	Change since 2003
Riverina	8,480	31%	+164	3,456,661	+145,736
Murray Valley (includes part of NSW)	6,730	24%	-256	3,168,208	+43,190
Riverland	6,341	23%	-986	2,763,021	-154,333
Queensland	3,829	14%	-800	1,576,889	-340,013
Western Australia	1,260	5%	+189	598,280	+126,655
East Coast NSW	417	1%	-140	239,275	-86,547
Bourke and Narromine	349	1%	-239	165,508	-154,134
Northern Territory	220	1%	-5	79,937	+165
Total	27,627	100%	-2,075	12,047,779	-419,281

In summary for Australian citrus:

- In 2008, there were 1,957 citrus properties growing 27,627 hectares of citrus in the main citrus growing regions of Australia.
- Valencia oranges are the dominant planting (28%), followed by washington navels (13%), late lane navels (11%) then imperial mandarins (6%). (See Table 1)
- While the number of citrus growers declined from 2,259 in 2003 to 1,957 in 2008 (a 13% decline), the average citrus area per property increased from 13.1 to 14.1 hectares.
- The area of citrus declined by 7%; from 29,702 hectares in 2003 to 27,627 hectares in 2008. While this equates to an overall decline of 2,075 hectares, there were 4,066 hectares of new or reworked plantings from 2003 to 2008. (See Table 2)
- The number of citrus trees declined by 3%; from 12,467,060 in 2003 to 12,047,779 in 2008.
- New citrus is being planted at higher densities. The average trees/ha increased from 420 in 2003 to 436 in 2008.
- Australian citrus is predominantly grown on trifoliata rootstock and irrigated with low level sprinklers.

Citrus Packer Newsletter

Providing information on post harvest issues for citrus growers

This valuable newsletter reports the results of citrus post harvest work done by the post harvest team at SARDI (South Australian Research & Development Institute). The newsletter is published quarterly and is put together by Peter Tavener and Nancy Cunningham. The post harvest program and newsletter are supported financially by Citrus Australia, SA Citrus Board, Riverina Citrus, Murray Valley Citrus Board, Riversun, Horticulture Australia Limited and Primary Industries and Resources SA.

The latest Packer Newsletter (No. 93) contains articles on post harvest fruit pitting and high pressure washing. The newsletter can be found at http://www.sardi.sa.gov.au/foodinnovation/publications/citrus_packer_newsletter

The website also contains past issues of the Packer Newsletter, as well as an alphabetical index on all articles published. So for all your Australian citrus post harvest issues take a look at this newsletter.

New Department of Industry and Investment



Following on from the Premier's announcement on 11 June 2009 regarding reforms to the NSW Public Sector, 13 new "super departments" have been formed.

As of 1 July 2009 the new Department called Industry & Investment NSW brings together:

- Department of State & Regional Development (including Tourism NSW)
- Department of Primary Industries (including Forests NSW)
- Department of Water & Energy (Energy component)
- NSW Food Authority
- Film & Television Office
- Rural Assistance Authority
- Mine Subsidence Board
- Game Council of NSW

The new Department has around 4,000 people in over 160 offices in NSW and several overseas.

Dr Richard Sheldrake has been appointed as the new Department's Director-General.

The new Department has a number of Ministers.

The Hon. Ian Macdonald, MLC

Minister for Primary Industries
Minister for State Development
Minister for Energy
Minister for Mineral Resources

The Hon. Phillip Costa, MP

Minister for Regional Development

The Hon. Jodi McKay, MP

Minister for Tourism
Minister for Science & Medical Research

The Hon. Steve Whan, MP

Minister for Small Business

Organic citrus - new grower manual launched

Australian citrus growers have a new resource to assist them in the transition to sustainable organic management. The manual is the result of a project jointly funded by RIRDC, the Victorian Department of Primary Industries, and the Murray Valley Citrus Board. The manual addresses the specific information needs of organic citrus producers and growers who are interested in converting to organic systems.



Demand for organic products in Australia far outstrips supply and even during the current economic downturn consumers are prepared to pay a premium price for organic produce. Organic produce is now also becoming widely available in mainstream supermarkets such as Woolworths, Coles and Aldi. Organically produced foods are estimated to be valued at more than \$230 million at the farm gate.

A growing sector of the organic industry is organic citrus, which currently produces about 700 tonnes per year. Although organic production currently makes up a small part of the citrus industry, there is considerable potential for growth as consumers continue to increase their demand for 'clean & green' food.

RIRDC reports are available to download or purchase at www.rirdc.gov.au. The manual costs \$35.

Nothing moves fruit like repeat business WA introduces maturity standards for citrus

Nathan Hancock, Citrus Industry Development Officer, Dept of Agriculture and Food, WA.

Citrus as we all know is by and large a commodity, there are some recognisable brands in every state, but oranges are oranges and so on. When the Western Australian local season starts it is difficult to get any traction, as we are competing with cheap US imports and new season fruit from the eastern states.

An often quoted piece of consumer research states that once a consumer purchases a piece of fruit and finds it not to their liking it can be up to 8 weeks before they will repeat their purchase, opting for other fruit options in the mean time.

The WA Citrus Council felt that a regulation that specified minimum internal maturity of fresh citrus would take the guess work out of purchasing fruit and reduce the time between repeat purchases.

Citrus fruits maturity parameters 2009

Table 1. Minimum Brix°: Acid Ratio

Fruit type	Minimum Brix°: Acid ratio
Mandarins	8° to 1
Oranges (navel only)	8° to 1
Oranges (other than navel)	7° to 1
Grapefruits and pomelos	6.5° to 1
Hybrids of any species	8° to 1

Table 2. Total soluble solids (sugar level)

Fruit type	Total soluble solids determination
Mandarins	8°Brix at 20°C
Oranges	8°Brix at 20°C
Grapefruits and pomelos	8°Brix at 20°
Hybrids of any species	8°Brix at 20°C

Table 3. Minimum juice content

Fruit type	Minimum juice content (%)
Lemons	25
Mandarins	28
Oranges	33
Grapefruits and pomelos	33
Limes	33
Hybrids of any species	33

Consumers buy with their eyes and buy again with their taste buds.

In WA, the Citrus Fruits Grading Code 2008 prohibits the sale of citrus that does not meet market grade, which is determined by the minimum maturity parameters. The parameters are currently based predominantly on recognised export standards of minimum juice, minimum Brix° and the sugar acid ratio. These are under review and will be altered in time to further reflect consumer preference.

Currently the Citrus Council is working to make the national citrus industry aware of the code and the parameters so that importers are able to prepare for the changed conditions in our market – the code applies to all fresh market citrus fruit. Undergrade fruit will be destroyed and fines will apply. For further information contact WA Citrus Industry Development Officer Nathan Hancock at nhancock@agric.wa.gov.au

Saving soil ***A landholder's guide to preventing and repairing soil erosion***

This guide brings together current information from a variety of sources that will provide the reader with a useful resource to:



- understand techniques to prevent and remedy erosion
- apply these techniques to their landscape and soil type
- integrate erosion control in their routine land management
- fix minor erosion problems
- know when to seek technical expertise
- know what to ask experts.

The guide is designed for new and long time landholders, community support officers, extension officers, Landcare groups, and agricultural industry bodies.

The guide is available for download from the I&I NSW website at: <http://www.dpi.nsw.gov.au/agriculture/resources/soils/erosion/saving-soil>

What's it like to work on your farm?

Michael Ison, Dairy Officer – Human Resources, I&I NSW Paterson
Extracted from I&I NSW Dairynews, Issue 6, Spring 2008

Trying to make people “fit in” to existing practices that are difficult, unrewarding or unsatisfying will contribute to people leaving and will make it more difficult for you to attract the right people. Here are my observations of what you see on a happy and productive dairy farm.

Adaptability – “On our farm, we know that constant learning, new ideas and adapting to what the external environment sends’ our way is critical. To this end our people are encouraged to learn and innovate.”

Responsibility – Individuals are encouraged to behave responsibly and to take risks. While the buck may stop with the farm owner or manager, individuals still have plenty of loose change in there pockets.

Values and Principles – The things that are important to the farm owners and the business are recognised and understood by all and there is an internal motivation to reach higher and excel. The values that are expressed by people on the farm line up with clear principles such as justice, fairness, openness and win-win.

Rewards – Everone feels rewarded by the work and effort they put into the job. This is not just about money, but about non financial pats on the back and the fact that the reward is linked to the performance.

Clear thinking – What we aspire to on this farm is clearly understood by all. “I know what my role is in reaching the farm goals and I know what to do.”

Dedication – “We are committed to the farm team and cooperate with others to reach the farm goals and are prepared to work through the ups and downs to achieve the goals.” To back up these observations, studies of workplaces and interviews with employees show that the working environment and relationships with “the boss” and co-workers is rated as a key part of work satisfaction and retention.

In a recent survey of company employees, 80% said they had left a previous job mainly because of their relationship with their boss or manager.

Author, Leigh Branham in his book “The Seven Hidden Reasons Employees Leave” suggests the main reasons that people leave are:

1. Unmet expectations
2. Mismatch skills
3. Lack of coaching and feedback
4. Limited growth opportunities
5. Feeling unrecognized or devalued
6. Overworked
7. Loss of confidence in senior leaders

Because work takes up a large proportion of people’s life and time – having motivating work environments can make the difference to our entire well-being – and therefore work-performance, allgood reasons to create a farm business that suits people.

Flying-foxes and damage to fruit crops

A Reminder to NSW Commercial Fruit Growers

On 11 August 2009, the NSW Government released the final report of the independent Flying-fox Licensing Review Panel, established last year. The report will provide input into the development of a new policy for managing the impact of flying-foxes on commercial fruit crops.

However, in the interim, licensing arrangements will be maintained. All flying fox species are protected in NSW and commercial fruit growers who intend to scare or shoot at these animals with firearms must apply to their local National Parks and Wildlife Area Office for a licence.

Licences to harm a limited number of flying foxes are issued to growers who can demonstrate damage to their crop. These licences are issued within 24hrs of a property inspection by the local Parks and Wildlife ranger.

For further information or contact details for your local NSW National Parks and Wildlife Area Office please call (free call) 1300 361 967.

A copy of the review panel’s report can be found at <http://www.environment.nsw.gov.au/threatenedspecies/Flyingfoxlicrev.htm>

Carpophilus beetle 'Attract & Kill' system

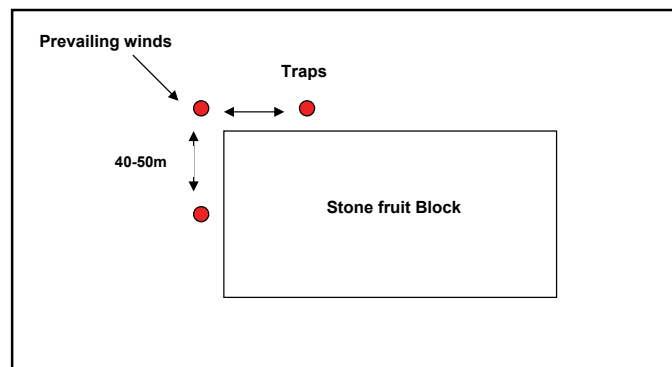
The 'Attract & Kill' system is based on the use of monitoring traps and baiting stations installed in the orchard well before harvest.



Monitoring traps (1 per ha) need to be placed in each block 1 week before the 'Attract & Kill' baiting stations are deployed. The monitoring trap should be placed about 15-20 m inside the block. These traps contain fermented apple juice and an insecticide strip. These traps need to be serviced weekly and left in place for 2 weeks after harvest.



A baiting station on the edge of a stone fruit block being protected.



The 'Attract & Kill' baiting stations need to be placed in stone fruit blocks, 6-7 weeks before harvest. Three 'Attract & Kill' traps per hectare is the recommended density. Traps should be placed about 40-50m apart, starting in the corner of the block closest to the prevailing wind direction - see diagram above.

The 'Attract & Kill' baiting stations are baited with a synthetic pheromone and co-attractant solution. The co-attractant solution needs to be replaced weekly and the pheromone replaced fortnightly.

For more information on this system and where to purchase traps contact Bio Global on 03 5941 1234 or Product Manager Mr Geoff Brooke on 0409 401 113 or geoff.b@bioglobal.com.au

Available September

The 2009/10 edition of the Orchard Plant Protection Guide for Deciduous Fruits

For a copy contact your local District Horticulturist. Also available on the I&I NSW website <http://www.dpi.nsw.gov.au>. Go to Agriculture → Horticulture → Pests diseases & disorder in horticultural crops → Orchard Plant Protection Guide.

Low Chill Australia Inc

Annual membership 2009–2010 is now due. Membership fees for growers is \$110/annum.

For more information go to www.lowchillaustralia.com.au.



Frost management field day report

Phillip Wilk, District Horticulturist, I&I NSW, Alstonville.

This report extracted from the Low Chill Stonefruit Grower newsletter, August 2009, Issue No. 3/09

A field day for low chill stone fruit growers was held on 13th May at Bangalow, northern NSW to showcase methods growers are trialling to reduce the risk of frost damage after last season's disastrous crop. The field day was organised by I&I NSW in conjunction with Low Chill Australia and sponsored by Norco Rural Stores. The day was warm and sunny and well attended by over 40 growers and resellers from northern NSW and southern Qld.

Over the last two seasons growers in the Bangalow valley have experienced the worst late season frosts in recent times which wiped out more than 60% of the developing crop of early peaches and nectarines.

At a recent climate change forum presented in Lismore by I&I NSW, producers were presented with information from the Bureau of Meteorology suggesting that the northern rivers region will be ideally located as a food production area and could be expected to experience only slightly increased temperatures but also receive significantly greater summer rains.

This may mean that colder valleys such as Bangalow will be better placed than most other areas within this region to gain sufficient winter chilling necessary to produce each season's stone fruit crop. Unfortunately the occasional late minus six to minus nine degree centigrade frosts can wipe out small pea sized developing fruit. Early season low chill stone fruit commands a market premium as it harvested two months ahead of traditional stone fruit regions of southern NSW and Victoria.

Bangalow valley stone fruit growers have used a number of devices in the past to minimise late frost damage to trees and fruit with only limited success. These methods include applying anti-transpirant sprays, using overhead sprinklers, burning smudge pots and driving up and down rows with tractor mounted air blast spray units.

Local growers have been trialling a portable wind machine produced by Alex Carter of Tatura Engineering. This technology is not new and larger gas powered machines have been operating in southern NSW for



Frost Stoppa with large propeller and fibreglass housing.

many years. The machine when functioning draws warmer air from above and directs it downwards into the orchard. This stops colder air from settling in lower places and mixes the warmer air from above which effectively stops frost from forming. The machine will treat an area of approximately three hectares so more than one unit may be needed to cover the whole valley. The unit operates with an electronic sensor that alerts growers who may be asleep, that the critical temperature for crop damage is approaching.

Environmental Health Officers from Byron shire council also addressed local growers on the Protection of the Environment Operations Act (POEO) and what constitutes an offensive noise. The officers measured the



Frost Stoppa in action driven by the tractor PTO.

noise levels of the tractor driven machine at a number of distances on the day and stated that if it were strategically placed on the farm it should cause minimum disturbance to nearby village residents. The worst case scenario may mean the machine would only be used between three and ten nights per year for a number of hours usually from midnight to dawn.

Frost risk management

The field day focussed mainly on the use of mechanical frost control using portable wind machines. Although wind machines are generally highly effective at minimising chilling injury to fruit, growers need to be aware of other available alternatives. Other mechanical frost control alternatives are:

- overhead sprinklers
- orchard heaters
- frost alarms

Sometimes more than one of the alternatives may be employed together, such as frost alarms and wind machines or frost alarms and overhead sprinklers.

Generally on the NSW north coast the frost danger period is July and August. Most stone fruit trees are still dormant for most of June and buds that are still at the early bud stage can withstand -3°C to -6°C temperatures within the shuck.

Once flowers and fruit have set, the period from shuck fall to stone hardening (about 40 days) means that fruit are vulnerable until about the end of August bearing in mind that there are overlapping varieties. Nectarines are more susceptible to cold damage than peaches as there is less flexibility in the skin.

The weather patterns that growers should be watching at this time of the year are predictable to some extent. If using the Bureau of Meteorology website, the weather pattern is usually preceded by a deep low pressure zone that brings cold Antarctic air right up into higher parts of NSW and Queensland. This often results in snow in places such as Tenterfield, Stanthorpe and Armidale. It may bring rain but usually results in overcast conditions. This further allows temperatures to cool down.

At this stage growers should be very cautious as it is usually the next 3–4 days after this weather has occurred that frost is imminent and damage to fruit may occur. This happens as the windy weather accompanying this cold front moves out to sea (overcast days followed by cloudless night) and the northern part of the state gets dry clear nights. These clear nights also give warm dry

days with a south westerly air stream. The wind is usually light during the day and in the early afternoon drops so we have still conditions. This usually results in frosts.

What can growers do to minimise damage from frost at this stage?

A light frost on the ground will usually not cause any major damage at this stage. However, if orchards are in a location where cold denser air flows downhill and cannot escape (such as Bangalow valley), the cold air will slowly fill the valley. At the bottom is the coldest air and as one moves up from the valley floor the temperature slowly rises.

In some places it may be as simple as removing a row of windbreak trees that allows cold air to drain away to a lower area that will minimise frost damage.

Cultural control measures such as maintaining a weed free mowed orchard will result in less frost. This is due to the inter-row sward of grasses allowing any available sunlight to reach the orchard floor. This warms the soil and also provides an insulation blanket. If the inter-row vegetation is left long and unmown, the soil temperature reserve that built up during the day is greatly reduced and so it will cool quicker at night. The principal is to store heat in the soil during the day for later release at night.

There are also a number of chemical application sprays that provide some degree of protection. Ectol® and Envy® are two such products. They have their limitations and usually will only minimise frost damage down to -3°C . Ectol is a spray-on seaweed extract which has a 10 day effective life. Envy® is a liquid spray on polymer film that is often used for seedling transplants and is mainly used as an anti-transpirant. Both have been used by local fruit growers and have been partially effective when combined with other alternatives such as overhead irrigation.

Overhead irrigation systems

The most common method of reducing late frost is with the use of overhead sprinklers. These are usually combined with frost sensors that alert growers during the night.

The principle is that when water is applied to zero or sub zero temperature conditions it freezes and gives out heat to the surroundings and thereby raises the temperature slightly in its surroundings. To achieve successful frost control a film of continuously freezing water must be maintained on the ice surface.

FarmReady reimbursement grants for approved training

As the ice begins to melt after dawn when the air temperature begins to warm, heat must be applied to the ice or it will draw warmth from the crop itself. The heat is supplied by the irrigation system.

An application rate of 3.5mm/hr is adequate for frost down to -4°C. Under tree sprinklers will give some protection but not to the same degree.

Disadvantages of the overhead sprinkler system are that if frosts begin early in the night before midnight, they must be operated for several hours. Many soils may become waterlogged. This may cause or promote root diseases such as Phytophthora. Secondly, with severe prolonged frosts, limbs may break from the weight of the ice build up.

Orchard heaters

Orchard heaters, frost or smudge pots have been used and are effective in a number of situations. In the past they were used and are still employed in some nurseries to protect high value crops. The burning of oil in frost pots heats up the air and creates localised convection currents which causes a mixing of the air. Many pots are required to create this mixing of the air in the order of 120 to 170 /ha which is very expensive to buy and operate. In areas such as the Bangalow valley where there is a number of rural subdivisions in close proximity to horticultural orchards, it is highly unlikely that orchard heaters would be acceptable to the local council and community due to a reduction in air quality.

Information extracted from Frost damage, control and prevention-fruit and vines Agdex 200/10, D. Pocock and A.Lipman, Primary Industries and Resources South Australia Fact Sheet 1998.

FarmReady, a part of the Australian Government's Australia's Farming Future initiative, offers support to primary producers to learn skills and strategies to help combat the impacts of climate change. FarmReady focuses on issues such as understanding the implications of climate change, whole-farm planning and business and risk management.

Primary producers, immediate family (over 18) and management level staff are eligible to apply for up to \$1500/person per financial year to attend FarmReady approved training.

Additional funding (capped at \$500/person/year) can be accessed for:

- meals (up to \$100/day),
- travel and accommodation (if more than 150km one way from the training site and the training starts before 9am, ceases after 5pm) and
- child-care costs (up to \$50 per child per day for up to 2 children and \$25 per additional child)

You must keep and provide Tax invoices and receipts for each cost to be claimed.

I&I NSW now has 17 courses approved for the FarmReady Reimbursement Grant.

- PMP for natural resource management
- Farm planning
- TopFodder silage
- Prograze
- Prograze Abridged
- Beef N omics
- Waterwise on farm

- Irrigated Lucerne for Profit
- Identification and management of native grass pastures
- Farming in a changing climate
- Conservation Farming
- LANDSCAN
- Centre Pivot lateral Move
- Healthy soils, healthy landscapes
- Farmers guide to managing climate risk
- Tactical Grazing in semi-arid rangelands
- Introduction to Environmental management systems in agriculture

To see what other courses are available, confirm that you are eligible and claim your reimbursement, visit www.farmready.gov.au or phone 1800 087 670.

FarmReady Industry Grants - round 2 now open

FarmReady Industry Grants of up to \$80 000 per financial year are available to eligible groups to undertake projects that deliver tangible outcomes and develop strategies to help their members adapt to climate change.

Guidelines and application forms for the FarmReady Industry Grants are available at www.daff.gov.au/farmingfuture.

Applications for Round 2 will close at 5pm 30 September 2009.

Widespread phytophthora damage to avocados

Dr Ken Pegg, Graeme Thomas & Simon Newett, QLD DPI &F.

In 1974 the damage caused to the Australian avocado industry by Phytophthora was extremely significant. Approximately 50% of trees growing at the time were either killed or reduced to a state of health where production was dramatically reduced. The effects of water logging and Phytophthora then continued for many seasons.

The current weather conditions experienced in the east coast avocado growing areas of Australia from Central Queensland through to Central New South Wales over the last six months have produced conditions similar to those of 1974.

The optimum temperature for avocado root growth is 27 – 33°C but the optimum range for *Phytophthora cinnamomi* is 19 – 25°C so when temperatures cool down in autumn Phytophthora root rot has a distinct advantage. Combine this with times when moisture conditions better suit the disease than the trees and in these conditions massive damage occurs. We are currently in the midst of one of those periods.

Severe root damage is occurring in these regions on what currently appears to be healthy orchards. These trees, if left without treatment, in many instances will continue to look reasonable until spring, when the pressures of flowering and increased temperatures occur and then will rapidly decline and in many instances, will die.

Many growers at present appear comfortable, thinking that they have their management practices up to date.

The management practises that many growers have adopted over the years have lead to very poor disease control. This along with the fact that some trees have been planted in areas of suspect drainage, will find water logging and increased Phytophthora activity will either kill the trees or dramatically reduce production and fruit quality.

These incorrect management practices include:

1. Making applications at the incorrect time of year.

Regardless of the manner in which phosphorous acid is applied to a tree, it moves with the sap flow to the part of the tree that is actively growing. If you apply when young



fruit are actively growing, phosphorous acid will not reach the root system where it was intended for but will move instead to the fruit and remain there, giving a fruit residue level higher than the maximum residue level.

There are only 2 stages when phosphorous acid can be applied to your trees, firstly when the spring flush has hardened, and secondly, when the summer flush has hardened up until approximately 6 weeks before flowering.

With some late maturing varieties, your phenological cycle is later than early maturing varieties grown in the same area. Adjustments should be made to your application times for these trees

2. Injecting too few sites around the tree.

Phosphorous acid does not move laterally in the tree. After application, it moves up the tree to the foliage and then down to the roots immediately below the injection site. If insufficient sites have been used, there will be large areas of roots that are not treated. In the conditions experienced recently, the untreated roots will be killed by Phytophthora.

Injections should be made with 20% phosphorous acid to ensure you have enough injection sites to spread around the circumference of the tree to achieve protection for the entire root system. 40% products such as Fosject 400 should be diluted with 1 part water to 1 part Fosject 400 to give a 20% solution. 60% products such as Fosject 600 should be diluted down with 2 parts water to 1 part

Fosject 600 to give a 20% solution. Always use a product that has been buffered to a pH of 7.2. Total volume injected per tree is calculated at a rate of 15 mL per metre of canopy diameter and the “shot” volume per injection site should be 20mL.

3. Foliar applications at the incorrect concentration and with insufficient volume.

With a 60% product such as Fosject 600 the correct dose rate is reached by adding 8.3 mL for each litre of water. For example with a 3000 litre spray tank, 24.9 litres of Fosject 600 should be added

The pH of the final mixture in your spray tank should be as close as possible to 7.2 to avoid leaf burn. The pH of different water sources vary so you need to use a reliable pH meter and add a neutralising agent little by little with repeated testing till this neutral pH is reached.

The entire tree needs to be saturated. On large trees, volumes that have produced the best results are 2500 + litres/ha.

From experience, four sprays will generally lift the root phosphonate level to a point where season long protection can be expected. To be sure that the result has been achieved root phosphonate analysis is highly recommended.

When copper residues are present on the tree, the use of surfactants has resulted in leaf burn.

Under current conditions of extreme damage, it is advisable to inject the trees. Trees already showing canopy symptoms will not absorb sufficient phosphorous acid from foliar sprays.



4. The use of bark paints on mature trees has shown very limited results.

From the results to date, the levels of phosphorous acid in roots are much less than those from other types of application. Also, with this method of application the risk of damage to the tree trunk is high.

Suggestions to reduce the impact of damage already occurring.

- If the time is right immediately inject trees using all correct guidelines. Ensure that you know your phosphonate levels in the roots. Trees with a reduced canopy can only receive trunk injection.
- Remove existing crop as soon as possible.
- Reduce canopy size in order to balance it with the reduced size of the root system. Aim to reduce stress on the tree in spring.
- Maintain even moisture levels under the tree. It is highly undesirable to have peaks of wet and dry soil moisture.
- Monitor soil moisture carefully to make irrigation decisions, install separate soil moisture monitoring equipment (e.g. tensiometers) where trees are affected worse than the rest of the orchard - affected trees require significantly less water than healthy ones.
- Immediately attend to drainage issues in poorly drained areas.
- Apply all other general principles for good Phytophthora management.

New Plant Health Act for SA

Steeper penalties and tougher restrictions on the movement of plant and plant related product in and out of South Australia NOW APPLY.

The new Plant Health Act further protects SA's \$1.5 billion fresh fruit, vegetable, grape and field crop industries from the introduction of pests and disease of quarantine concern. To ensure SA maintains its fruit fly freedom status and favourable plant health reputation, it is critical to minimise the risk of introduced pests or diseases. The new Act represents a significant step forward in improving the State's ability to prevent, detect and respond swiftly and effectively to incursions of pests and diseases. It also brings South Australia into line with other states, and bolsters our interstate biosecurity measures. Fines and penalties apply from 1 July 2009.

Information for importers

- The new legislation improves the import certification system, and provides enhanced protection for the fresh fruit and vegetable industry in SA.
- A register of importers has been established. This has the support of the Horticulture Plant Health Consultative Committee, representing key industry groups and the Adelaide Produce Market.
- It is a legal requirement that you must be registered if you import fruit, vegetables or plant material.
- PIRSA oversees an Import Verification Compliance Arrangement system (IVCA), which provides a cost-effective and efficient produce clearance system for importers.

For further information on registration as an importer and IVCA accreditation please contact PIRSA Plant Health Operations on 1300 666 010 or www.pir.sa.gov.au/planthealth.

Information for the travelling public

- The public faces increased on-the-spot fines and penalties for trafficking fruit, vegetables or plant material.
- An on-the-spot fine of \$315 will apply for most offences.
- Travellers are not permitted to bring fruit, vegetables or plant material into South Australia.

- It is also illegal to take fruit and vegetables purchased in SA into the Riverland without an itemised receipt or a Plant Health Certificate.
- Random roadblocks operate on key South Australian roads to enforce the new legislation.

Information for transport companies

- The new legislation requires transporters carrying fruit, vegetables or plant material into SA to provide a manifest to PIRSA indicating the impending arrival of that produce into SA.
- Manifests must be provided to PIRSA by: Email: pirsa.planthealthmanifest@sa.gov.au or Fax: (08) 8124 1467. PIRSA will contact transporters to explain changes in more detail.
- Under the new Plant Health Act 2009 there are provisions for fines and/or penalties to apply for non-compliance.

Don't risk a fine

- \$315 for an individual caught illegally carrying fruit, vegetables or plant material into South Australia or the Riverland.
- \$20,000 for a truck driver caught illegally carrying fruit, vegetables or plant material into South Australia or the Riverland.
- \$100,000 for any company caught illegally trafficking fruit, vegetables or plant material into South Australia or the Riverland.

For further information contact: PIRSA Plant Health Operations on 1300 666 010 or visit www.pir.sa.gov.au/planthealth

WANTED

Brushing and washing components for citrus packing line.

Phone Bill on 4997 4976

Voluntary conservation hunters helping fruitgrowers on the Central Coast

David Smith, Game Manager Central Zone, Game Council NSW

Voluntary conservation hunters are helping control a slightly unusual pest on Central Coast orchards – deer!

Game Council NSW, the licensing and regulatory authority for licensed hunters in NSW, have facilitated the formation of a local Conservation Hunting Group which is assisting fruitgrowers limit the damage caused to their fruit trees by fallow deer.

The Game Council does more than just manage the impact of game and feral animals on declared public land through their hunter licensing and booking system. The Game Council also works with landholders and land managers to implement animal control programs on a variety of public and private land areas.

In the Somersby area on the Central Coast of NSW, local citrus growers were experiencing damage to fruit trees from a local herd of wild fallow deer.

During the period before the peak mating season (March-April) male fallow deer strip velvet from their antlers by rubbing them on trees.

In these local orchards, the deer were using the fruit trees to strip their velvet and causing unacceptable levels of damage and production loss. In addition fallow deer also eat developing fruit buds from the trees.

A focused effort targeting male deer during the period when they are ‘rubbing’ along with continual harvesting to reduce the overall deer

population to a level acceptable to property owners has seen a reduction in damage to fruit trees.

This project was part of the Game Council’s work with landholders and land managers to help property-owners throughout the State.

In this, they liaise with a number of private landholders throughout the State as well as with local councils, other Government agencies, rail corporations, universities and State parks.

Conservation Hunting Groups are comprised of Restricted (R-Licensed) hunters who voluntarily give their time and hunting skills to manage game and feral animal populations.

These groups involve a Coordinator appointed by the local Game Council game manager to lead the group. This Coordinator then becomes the contact point for the game manager, participating properties, hunters; and other stakeholders including neighbours, NSW Police, and other agencies.

Management programs for these projects are formally developed to cover all aspects of animal control on that land. The programs must include: what can and cannot be harvested; when the property can be accessed; safety management issues; communications strategies; and other aspects that make up a Property Based Management Plan.

Programs are ultimately approved by the landowner/manager, with written permission to members of the local Conservation Hunting Groups to carry-out the control programs.

These programs have included management of species such as rabbits, goats, pigs, deer, and other game and feral species. Where native animals are in over-abundance, we liaise with the NSW National Parks and Wildlife Service to obtain the appropriate permits for hunters to be able to control these animals.

Programs such as those in Somersby are developed by the Game Council and implemented by conservation hunters at no cost to landowners.

For more information on the Somersby Conservation Hunting Group and it’s program please contact the Coordinator, Roger Thornback on 0411 116 044.

For other information, contact your local Game Council NSW Game Manager:

Brent Waldron, **Murray/Riverina**, Ph: 03 5883 1644 or 0409 222470, Email: gmmr@gamecouncil.nsw.gov.au

Troy Hogarth, **Sydney Metropolitan/Central West**, Ph: 02 96732458 or 0417 300 076, Email: gmsyd2@gamecouncil.nsw.gov.au

David Smith, **Sydney Metropolitan/Central West**, Ph: 02 96732458 or 0417 300 034, Email: gmsyd1@gamecouncil.nsw.gov.au

Chris Hyde, **Snowy/South East**, Ph: 02 69471462 or 0417 300 502, Email: gmse@gamecouncil.nsw.gov.au

Q biotype whitefly – a new insect pest identified in Queensland

Extracted from the Qld Department of Primary Industries and Fisheries Factsheet

What is Q biotype whitefly?

A new insect pest—the Q biotype Whitefly—has been discovered in Queensland crops. While many crop producers would be very familiar with the silverleaf whitefly (B biotype), this new strain of the *Bemisia tabaci* species complex is now in Australia. It is important because it has the ability to develop resistance quickly to some insecticide groups, particularly if they are used repeatedly.

The presence of Q biotype was confirmed from whitefly collections from vegetable crops in north Queensland in late 2008, and southern Queensland and north-western NSW in 2009.

These biotypes are morphologically identical and can only be separated using biochemical or molecular techniques.

Overseas, Q biotype has developed high level resistance to insect growth regulators (IGRs) such as Admiral® and neonicotinoids such as Confidor®. This has resulted in serious control difficulties, particularly in glasshouses.

What crops are affected?

Q biotype has a host range of greater than 500 species and includes:

- Cucurbitaceae: melons, squash, zucchini, pumpkin, cucumbers
- Solonaceae: tomato, eggplant, potato and to a lesser extent capsicum
- Brassicaceae: cabbage, broccoli, cauliflower
- Fabaceae: soybeans, green beans
- Malvaceae: cotton
- Convolvulaceae: sweet potato
- and a wide range of ornamental species

Q biotype distribution

Q biotype has been identified in vegetables in some locations in the Bowen and Burdekin regions in north



Queensland and in cotton in southern Queensland (Goondiwindi) and north-western NSW (Wee Waa). It is likely that Q biotype is more widely distributed than just these regions.

Q biotype can disperse by short flights, and may also be capable of longer distance flights associated with B, but transportation on ornamentals is the major means of spread over long distances.

How do you know if you have Q biotype in your crops?

A main indicator of Q biotype could be the presence of high densities of whitefly that are not readily controlled by the use of insecticides. Both Q and B biotypes may have various levels of insecticide resistance. It requires analyses at the molecular level to distinguish between these biotypes.

What should you do if you suspect you have it in your crops?

Contact your local I&I NSW office, to organise to have the whitefly correctly identified.

Infestations of Q biotype may potentially be very difficult to control with some registered insecticides.

Where can I find more information on Q biotype?

Whitefly home page: http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/26_10277_ENA_HTML.htm

Hawkesbury Nepean \$77m river recovery program

From the June 2009 edition of *Agriculture Today*.

Landholders will be offered \$13 million dollars in incentives plus a range of services in a series of major projects to restore the health of the Hawkesbury Nepean river system, now under extreme stress.

Two of the new projects, worth \$28m will aim to reduce up to 38,800 kilograms of nitrogen and 7200kg of phosphorus from entering the rivers and save up to 5.9 gigalitres of water each year.

In recognition of the vital role of agricultural industries as providers of fresh local produce and many thousands of jobs to the greater Sydney region, the Federal Government has developed the Hawkesbury Nepean River Recovery Program, on which a total of \$77m will be spent.

Through the Water Smart Australia fund, the Federal Government will fund I&I NSW to deliver two parts of the new program – the Nutrient Smart Farm and the Water Smart Farm projects. For these two projects, the Federal Government will contribute \$25m. The NSW Government will put in \$3m through the NSW Climate Change Fund.

The Nutrient Smart Farm project will reduce the amount of nitrogen and phosphorous leaving farms and polluting the river system. “This project aims to reduce expensive nutrients being wasted and leaving farms before they have had a chance to be effective,” Mr Upjohn said. “Training activities for landholders and grants for farm based projects aimed at improving nutrient use will be the key here.

“The project will result in improved water quality for the environment and the community.”

The Water Smart Farms project will increase the efficiency of irrigation water use, contributing to substantial savings for irrigators, and reduce the quantity of irrigation water taken from the Hawkesbury and Nepean rivers. The project offers incentives for irrigators to update their equipment, including “retro fitting” – allowing for the latest technology plus management based efficiencies and operating costs reductions.

The Water Smart Farms project will also set up a satellite and SMS mobile phone based irrigation scheduling program for irrigators to set irrigation timing and

frequency.

I&I NSW will work with the Hawkesbury Nepean Catchment Authority to roll out the incentives packages. The Richmond office of I&I NSW will be the first point of contact for landholders wishing to work with the project.

Incentives and services

Landholders will be offered:

- Soil tests, to assist in determining appropriate fertiliser regimes.
- Workshops, including WaterWise and soil health workshops covering best practice nutrient and water management.
- An SMS service to advise appropriate irrigation schedules.
- A share of about \$13 million in incentive funds, to assist in implementing best practice nutrient management and water management technologies.
- Field days and opportunities to visit a best practice demonstration farm, as well as other farms where project initiatives are providing gains.

Where the \$13m funding will go:

I&I NSW and Hawkesbury Nepean Catchment Authority will together roll out:

- Sprinkler retrofits and upgrades Irrigation system conversions;
- Water harvesting systems;
- Water recycling systems;
- Alternatives to traditional fertiliser regimes, such as applying compost;
- Increasing perimeter vegetation;
- Stock exclusion fencing from waterways;
- Increasing groundcover to reduce erosion;
- Dairy laneway, wash down and effluent management improvements.

For more information contact I&I NSW Richmond, (02) 4588 2100.

Putting farmers markets on the menu

Source: July 2009 edition of *Agriculture Today*.

Farmers markets tend to complement, rather than compete heavily with retailers, and their success can depend largely on location and when they are held.

A recent forum found that consumers who go to farmers markets then tend to move on to other retail shops. There is also anecdotal evidence that local fresh food markets attract new visitors to town centres, according to Industry & Investment NSW (I&I NSW) resource management officer at Richmond, Andrew Docking.

The forum in Penrith brought together farmers market organisers, farmers, city centre managers and council representatives. Organised through the [Greater Western Sydney Economic Development Board](#), the forum analysed ways to invigorate town centres through alternative local fresh food marketing strategies.

Mr Docking said I&I NSW wanted to find out the key success factors and pitfalls to energise town centres through community participation. "Connecting consumers by direct marketing local fresh food provides alternative markets for farmers from the Sydney and nearby regions," Mr Docking said.

The forum reviewed the success of [Hawkesbury Harvest Farmers Market](#) at Rouse Hill Town Centre, held on the fourth Saturday each month. Centre manager, Martin Ollis, said the market day attracted 3000 to 5000 additional visitors to the town centre.

"Consumers tend to go to the farmers market then to other retail shops for additional items or services," Mr Ollis said.

Even a small town such as Carnarvon in Western Australia, with a population of 5000, attracts tourists and locals to the Gascoyne Farmers Market, which reported a peak attendance of 2500 people.

One farmers market that did not fare well was the Hawkesbury Harvest Farmers and Fine Food Market in St Mary's Cathedral Square in Sydney. Held on Fridays, the aim was to attract city office workers. Hawkesbury Harvest secretary, Alan Eagle, said it worked as a lunch stop, however, buyers had difficulty storing produce in the office, then lugging bags home on public transport. Consequently, farmers who had sometimes travelled long distances only sold small amounts and the market was unviable.



Jane Adams, chair of the [Australian Farmers Markets Association](#), says other criteria for successful farmers markets include:

- Ensuring produce has come direct from the farm.
- Regularity of market and quality of produce.
- Wet weather options and availability of parking.
- Adopting a professional and commercial approach to market management.

The challenge in Sydney, with a population of four million people, is that there are too few farmers to supply the expanding markets that councils and entrepreneurs wish to establish.

Market managements are starting to compete for farmers, which can tempt managers to let authenticity slip. Hawkesbury Harvest is aware that farmers are distance and time poor, and allows them to on-sell their farmer colleagues' produce. The complexity of what is genuine farm produce is often not well defined for consumers at farmers markets. For example, any signage will more than likely be put up by the farmer.

It is difficult for market management to administer and enforce standards, which can lead to thorny situations on market day. Ms Adams advocates that an independent organisation should oversee the auditing and compliance of farmers markets, as proposed by the [Victorian Department of Primary Industries](#).

Markets provide farmers with not only an alternative revenue stream to selling at a central market, but also provide links between urban and rural communities and are seen as a positive by town centre management.

For more information contact Andrew Docking, Richmond, (02) 4588 2128, andrew.docking@industry.nsw.gov.au



Citrus Australia welcomes trade improvements to China

Source: Citrus Australia, media release, 16 June 2009.

Citrus Australia Ltd, the national peak industry body representing citrus growers, welcomed the signing of the improved China quarantine protocol.

Citrus Australia Chair Kevin Cock said that this represented a significant investment and partnership by both industry and government to address stringent conditions set out in the first protocol signed in 2005.

“The improvements and flexibility now agreed to by both countries signals a significant step forward in increasing citrus exports to one of the worlds fastest growing economies - China.”

“Participating in Federal Agriculture Minister Burke’s delegation to China in April certainly assisted the negotiation process” Mr. Cock said.

Citrus Australia has worked diligently with the Australian Department of Agriculture, Fisheries and Forestry to improve the quarantine conditions for trade. There is a list of agreed priority items between industry and government used in the official negotiations.

Citrus Australia CEO Judith Damiani stated that the major wins with the amended protocol include

- the acceptance of higher cold treatment (2.1°C for 21 days for fruit flies);
- access to all ports;
- access for additional citrus varieties e.g. tangelos, sweetie grapefruit and limes

“The amended protocol is a positive step forward, but there is more work to be done to support further improvements including alternate options/treatments for certain quarantine pests such as Fullers rose weevil and light brown apple moth as well as the eventual recognition of fruit fly area freedom in southern Australia” Ms Damiani said.

Citrus Australia has also worked with Horticulture Australia Ltd (HAL) in implementing a China market development program to ensure benefits are passed back

to the grower. A committee of growers, packers and exporters meet regularly to consider market updates, export forecast, trade issues, marketing issues and recommend exporter to packer prices for oranges and mandarins.

For further information contact Citrus Australia on (03) 5023 6333.

Citrus Australia appoints new Chair

The Board of Citrus Australia, national peak body for citrus growers, has appointed Kelly Jones as Chair and Tania Chapman as Deputy Chair, effective 27 July 2009. The appointments come as existing Chair, Kevin Cock takes leave of absence from intense duties, remaining an active board director.

Kelly brings expertise in business management, information technology, project and change management and finance having worked in senior management positions and consultancy for ANZ Bank, MLC, NAB, Westpac, Deutsche Bank and IBM. Formerly a director of National Information and Communications Technology Australia, a current director of the Australian Red Cross Blood Service, Kelly holds a Bachelor of Science degree, a Masters in Business Administration and is a member of the Australian Institute of Company Directors.

Eradication of citrus canker from Australia

Citrus canker has been officially declared as successfully eradicated from Australia.

The National Management Group (NMG) accepted a recommendation from the Consultative Committee on Emergency Plant Pests that citrus canker has been eradicated from Australia on 23 January 2009.

Australia’s declaration of freedom from citrus canker follows a four and a half year long national program to eradicate the disease from around the township of Emerald in Queensland where it was detected in 2004. Citrus canker was found on three commercial citrus orchards in the Emerald district of Queensland between June 2004 and May 2005.

Over the course of the National Citrus Canker Eradication Program, the following key actions were taken to ensure eradication was successfully:

- In accordance with the nationally agreed Response Plan, all high-risk host plants within the Pest Quarantine Area (PQA), including approximately 495,000 commercial citrus trees and 4,000 residential trees, were destroyed prior to 31 December 2005 in preparation for an 18-month 'host-free' period. Any root growth was destroyed.
- Low risk native citrus (*Citrus glauca*) were also destroyed within buffer zones around all previous commercial orchards and the Emerald township. Remnant native citrus located outside these destruction zones were surveyed at 90-day intervals for a period of 18 months and demonstrated an absence of the disease in those areas.
- Replanting of commercial citrus orchards in the PQA commenced on 1 July 2007. All planting material was inspected prior to entry into the PQA.
- Surveillance was undertaken at 90-day intervals on all re-planted citrus to confirm there was no evidence of the disease and to confirm that it had been eradicated.
- Extensive surveillance of all other areas of Australia outside the PQA since 2004 confirmed the absence of the disease outside the quarantine area.

The National Citrus Canker Eradication Program was a cooperative effort between the Australian Government, the state and territory governments, and industry. The Department of Primary Industries and Fisheries in Queensland implemented and managed the program.

Citrus canker is a disease of citrus plants caused by the bacteria *Xanthomonas axonopodis* pv. *citri*.

The NMG is made up of representatives from the Australian Government, state and territory governments, and industry.

Sunraysia gets seasonal area freedom recognition

Source: SA Citrus Board newsletter, 8 May 2009.

After a number of years of effort by MVCB, Sunraysia citrus growers will be able to export citrus to Japan

without cold treatment. Australia's Agricultural Counsellor in Japan has received official advice from Japan's Ministry of Agriculture, Forestry and Fisheries that the Japanese Government has now recognised the Greater Sunraysia Fruit Fly Free Area as seasonally fruit fly free.

Citrus that is picked and packed in the Greater Sunraysia Area during the period 1 June to 31 December each year will be permitted to be exported to Japan without the requirement for cold treatment against fruit flies.

Managing citrus during restricted water allocations

Source: SA Citrus Board newsletter, 20 March 2009.

At a workshop held at Loxton Research Centre, representatives of the Riverland and Sunraysia citrus industry discussed citrus management strategies for drought conditions. The strategies were grouped into things that seemed to work, things that didn't work and other issues that need to be considered.

Here is a list of views which have not been rigorously tested but based on personal experience. They include:

Things that worked

- Water budgeting/ forward planning
- Hedging, up to removal of half the tree
- Pruning to target a certain level of water use and crop load
- Cleopatra Mandarin rootstock
- Mulching (including mulching of material removed by hedging)
 - Need to assess cost effectiveness, can be expensive to purchase
 - Need to check composition of mulch
 - Provides other benefits
 - More critical on lighter soil types
- Targeting water use according to expected return from specific varieties
- Polymers, especially in combination with other management strategies

- Irrigating before peak demand periods
- Soil water monitoring (including shovel)
- Soil solution sampling to monitor salinity

Things that didn't work

- Partial rootzone drying
- Light pruning
- Trying to spread available water too thinly across a property
- Sweet Orange and Trifoliata rootstocks
- Off season flowering (as a result of irrigation after severe stress), except in lemons
- Cash flow drought (still need yield to provide income)
- Panic buying of water
- Uncertainty of allocations across the season
- Early stress (reducing yield potential)

Under a research project titled “Enhancing the Resilience of Permanent Horticulture in South Australia” led by SARDI in SA, a range of more promising strategies will be closely examined over the next few years

US cuts Valencia numbers

Source: SA Citrus Board newsletter, 10 July 2009.

California is cutting its production of Valencia oranges. Growers are responding to consumers preferences for better looking fruit without seeds by moving to seedless varieties. Acreage once devoted to Valencias is being transitioned to seedless mandarins and other varieties, including grapefruit.

Greening disease endangers \$10 billion Florida citrus industry

Source: SA Citrus Board newsletter, 29 May 2009.

Researchers in Florida fear citrus greening could wipe out Florida's US\$10 billion citrus industry in the next decade. Florida's Department of Citrus have committed \$20 million to research ways to combat the disease. Citrus growers are additionally seeking financial support

from the Federal Government. Growers have warned that the effects of greening will be felt by more than those in the citrus industry if more farmers are forced out of business.

Florida and Brazil ally to fight greening

Source: SA Citrus Board newsletter, 29 May 2009.

Brazil and Florida battle fiercely in the global juice market, but growers from both countries have allied in the war against greening. Brazil, the world's largest orange grower supplying half the world's orange juice has been battling greening since its initial discovery in March 2004 in the state of Sao Paulo, the country's largest citrus-growing region.

The disease, discovered in Florida in August 2005, has spread to every major citrus-producing county in less than 2 years. Florida supplies 35% of the global orange juice, including 90% of the US market, the world's largest orange juice consumer.

New Plant Health Act for SA

Source: SA Citrus Board newsletter, 15 May 2009. T

The new SA Plant Health Act commenced on 1 July.

The new Act introduces requirements to verify that all produce imported into SA meets quarantine arrangements. The new legislation also increases penalties and introduces on-the-spot fines for people illegally carrying fruit, vegetables or plant material into South Australia and the Riverland to protect SA's \$1.5 billion fresh produce industry.

All agents and wholesalers who import plant and plant-related material into SA must register under the Plant Health Act 2009.

Some of the key changes under the new Act include the registration of all importers of plant/plant-related material into SA, a requirement that Manifests be provided prior to entry of plant/plant related material, and increased penalties for non-compliance.

The new Act also requires the inspection and verification of imported plant/plant related material, by either a

PIRSA Direct Inspection or through self verification and clearance of imports under an Import Verification Compliance Agreement (IVCA) Accreditation. Although IVCA has been operating and available since 2003, it's now supported by the new Act.

Importers, wholesalers and agents are encouraged to contact PIRSA inspectors and start the registration and accreditation process early. For more information visit www.pir.sa.gov.au/planthealth/legislation and www.pir.sa.gov.au/ica

Record \$515 million for NSW Primary Industries

The NSW Government will invest a record \$515 million in the state's valuable primary industries sector, supporting the jobs of more than 98,000 people directly employed in agriculture, fisheries, forestry and mineral resources.

Minister for Primary Industries Ian Macdonald said this year's Budget will deliver upgraded biosecurity and research facilities, as well as significant investment into clean coal technology.

"This is a record Budget which recognises the State's primary industries are the engine room of NSW," Mr Macdonald said.

"More than 98,000 people are directly employed in primary industries in NSW in agriculture, fisheries, forestry and mineral resources, and there is more than double that in related services.

"This Budget is about maintaining our State's world-class reputation for producing clean, fresh quality produce, that's why we are investing in biosecurity, which protects us from outbreaks of animal and plant diseases.

"We are investing record amounts to maintain our leading broad ranging research, extension and industry development programs, as well as important capital works projects.

"As part of this year's record breaking Budget we are continuing to invest in our research facilities at Wagga Wagga, where important research is being conducted into wine grape, canola, and sustainable farming systems, and where services such as feed quality testing are available to farmers.

"More than half NSW remains in drought and the Rees Government will continue to deliver funding and drought assistance measures to assist our State's primary producers.

"For our State's \$13 billion mining industry, this Budget recognises the need to ensure necessary rehabilitation works are carried out and that investment continues in Clean Coal technology, to reduce our carbon footprint."

Minister Macdonald said major initiatives in 2009-10 include:

- \$163 million for science and research activities and facilities, including \$8 million for the relocation of facilities from Narara to the University of Newcastle's Central Coast Campus at Ourimbah and \$1.4 million to construct a new laboratory to upgrade research facilities at Wagga Wagga.
- \$157 million for enhancing the department's Agriculture, Biosecurity and Mine safety group including \$17.7 million this year for the ongoing biosecurity upgrade at the Elizabeth Macarthur Agricultural Institute (EMAI) and \$6 million towards combating exotic pests and diseases.
- \$71 million for Mineral resources including \$1.9 million contribution towards derelict mine site rehabilitation and \$16.5 million investment in the development of clean coal technology through the Clean Coal Fund, including the carbon capture and storage demonstration project.
- \$2.5 million for industry development assistance and restructure under Brigalow structural adjustment arrangements. It follows the 2005 Brigalow decision where around 350,000 hectares of new reserves were created in the Pilliga region of NSW.
- Almost \$1 million for the construction of artificial reefs off Newcastle for recreational fishers. \$2.4 million investment into the development of state-of-the-art electronic information systems for catch reporting and quota trading.

"The NSW Government is working hard to support our State's primary industries and promoting industry diversification, which helps stimulate economic activity in regional communities and secures jobs for future generations," Minister Macdonald said.

Export market development grant (EMDG)

Source: SA Citrus Board newsletter, 10 April 2009.

Are you exporting, or thinking about developing export markets? If so check out the EMDG which reimburses up to 50% of expenses incurred on eligible export promotion activities such as overseas representatives; marketing consultants and overseas marketing visits; provision of free samples; and participation in overseas trade shows, seminars and in-store promotions. Expenses such as travel costs and promotional material can be claimed.

You must have spent at least \$10,000 in the financial year, but if it's your first claim you can roll 2 years expenses into 1 claim and you can claim up to 8 times. For information visit www.austrade.gov.au and view export grants under the assistance topic.

Fruit fly body of knowledge project

Source: SA Citrus Board newsletter, 23 January 2009

Plant Health Australia (PHA) has commenced a project to bring together, as much as possible, all the fruit fly information, published and unpublished by industry and government in Australia.

The information collected will include information relating to biology, ecology, surveillance, management, trapping, regulation and public awareness for Australia's most significant horticultural pest. Once gathered, the information will be held in a searchable central repository. The project will help lay the foundation for the work of the National Fruit Fly Strategy Implementation Committee and assist with market access issues..

UC Riverside releases new citrus variety

Source: SA Citrus Board newsletter, 21 August 2009

Citrus researchers at the University of California, Riverside have released a new mandarin (or tangerine) for commercial production. Named 'DaisySL' for Daisy seedless, the new fruit is finely textured and juicy, with a rich, sweet and distinctive flavour when mature. The

fruit's rind is smooth and thin and bears a deep orange flavour. The fruit averages 2.7 inches in diameter and 2.4 inches in height. Each fruit has 10-11 segments and a semi-sold axis of medium size at maturity. The fruit is juicy, averaging 47% juice and weighs 135g on average.

New horticultural industry award released

Source: Fruit Growers SA Vol 34

The Australian Industrial Relations Commission (AIRC) has released the Stage 2 award, including the new 'modern' Horticulture Industry Award to be implemented in 2010.

Some key features of the new award include:

- 25 percent casual loading, increasing from 23 percent
- No Saturday penalty, but Sunday penalty increased from 150 percent to 200 percent and all hours to be worked either 5 or 5 ½ days out of 7.
- Hours of work for employees other than packing house employees will be 38 hours over 5 days other than a Sunday – on more than 38 hours without payment of overtime
- Hours of work for packing house employees will be 38 hours to be worked including not more than 8 hours per day Monday-Friday between 6am and 6pm – no more than 38 hours without payment of over time
- Overtime rates are 150 percent for first 3 hours and 200 percent for all hours thereafter
- All Sunday work paid at 200 percent with a minimum of 4 hours payment (whether worked or not)
- Public holidays payable at 200 percent (currently 250 percent) with substitution of the day available.

Weed detection on farms – a guide for landholders

This booklet discusses the significance of weeds to Australian agriculture, and describes the current 'best practice' principles for early detection of weeds on farms. Go to www.ruralfutures.une.edu.au or www.lwa.gov.au/

What's on

25 August 2009 - North Coast Citigroup Seminar

“Copper sprays for disease control and assessing spray coverage”, 9.30 am at 168 Lindendale Road, Wollongbar. RSVP essential to Andrew Mason on (02) 6687 1540.

10 – 11 September 2009 – 13th Symposium on Precision Agriculture in Australasia

At the University of New England, Armidale.

For more information contact David Lamp 02 6773 3565 or Mark Trotter 02 6773 2465

20 – 22 October 2009 – Australian National Field Days, Orange

For more information phone (02) 6362 1588 or www.anfd.com.au/

28 February – 3 March 2010 – Global Biosecurity Conference, Brisbane

Global Biosecurity 2010 is Australia's first international conference and exhibition focused on agricultural and environmental biosecurity. For further details visit www.globalbiosecurity2010.com

What's new on the web

Horticulture for Tomorrow website for growers

Horticultural growers can now digitally access the on-farm manual for environmental management, *Guidelines for Environmental Assurance (EA) in Australian Horticulture*, free of charge at the new-look Horticulture for Tomorrow website, www.horticulturefortomorrow.com.au

The recently redesigned Horticulture for Tomorrow website provides access to the EA guidelines, as well as to a range of other useful resources. This includes the Horticulture Natural Resource Management Strategy, which enable horticultural industries to address environmental issues and communicate their successes.

Website for domestic market access

Australia's plant quarantine authorities have recently created a dedicated internet site for horticultural industries. The new website provides information on market access issues and contact details for members of the Domestic Quarantine and Market Access Working Group (DQMAWG), the key body that coordinates interstate movement regulations for plants and plant products in Australia. The website can be viewed at www.domesticquarantine.org.au

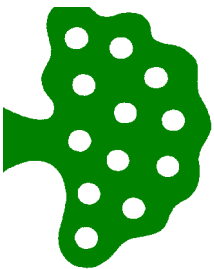
DAFF biosecurity e-news

The Department of Agriculture, Fisheries and Forestry (DAFF) has produced a biosecurity e-newsletter marking the recent release of the new “vital information” brochures. The “vital information” brochures were produced by DAFF in consultation with PHA to raise awareness, and encourage the adoption of on-farm biosecurity practices amongst producers. A copy of the newsletter and related resources is available from www.daff.gov.au/biosecurity

New Plant Health Australia website

The new website makes the information easier to find. There is also news, events and information on the Exotic Plant Pest Hotline. Go to www.planthealthaustralia.com.au

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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.

I&I NSW – Who to contact

Alstonville 02 6628 0604

Phillip Wilk – District Horticulturist

Mobile 0411 139 567

Camden 02 4640 6408

Lawrence Ullio – District Horticulturist –
currently based at Sydney Markets,

Flemington, **02 9735 9605**

Mobile 0412 436 871

Gosford 02 4348 1900

Sandra Hardy – Industry Leader-Cirrus

Mobile 0412 425 730

Maitland 02 4939 8888

Tony Somers – District Horticulturist

Mobile 0411 109 159

Genevieve Leonard – Agricultural Inspector

Neil Griffiths – Technical Specialist - Pastures

Richmond 02 4588 2100

Peter Malcolm – District Horticulturist

Mobile 0412 424 628

Bill Yiasoumi – Irrigation Officer

Rob Bowman – Senior Inspector

(Sydney & South Coast) 0411 139 579

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.

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