

COASTAL FRUITGROWERS' NEWSLETTER

ISSN 1446-0513

Inside

Australian Citrus Growers Conference 2008 Field tour report	2
Growing citrus in China	6
Scoping study to identify and quantify factors to improve summerfruit quality and consistency	7
Vertebrate pest control workshop – Report	11
Climate risk workshop – Report	14
Grafting vision speeds apples	17
Retain® as a management tool for low chill stone fruit varieties: an update	18
Low chill stonefruit - Looking after your trees after harvest	19
Would you like to be involved in climate research?	21
News in Brief	22
The special Conservation Scheme for primary producers	26
What's new on the web and publications	27

No. 71 Summer 2008/09

Dear Growers

Welcome to the final edition for 2008 – another year gone.

I'd like to take this opportunity to thank all our sponsors and authors for their continued patronage of this newsletter.

Inside this issue there are a number of reports from recent workshops, as well as a look at some of the things I saw at the recent Australian Citrus Growers Conference in Griffith.

Wishing you all a very Happy Christmas and a prosperous New Year.

Happy reading



Sandra Hardy

The Coastal Fruitgrowers Newsletter was first published in the Summer of 1991/92 and has been produced now for 17 years.

The printing and postage costs (about \$7,000/year) for the Newsletter need to be met by sponsorship money – and sadly in today's economic climate this is becoming increasingly difficult to achieve. Sponsorship money has been declining for a number of years and so unfortunately this issue was unable to be printed and is only available on the web. For your copy go to: www.dpi.nsw.gov.au/aboutus/news/newsletters/coastal-fruitgrowers.

In the new year the Newsletter may have to be published electronically, depending on sponsorship. My preference is to provide commercial fruit growers with a printed copy but this may not be possible.



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

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 NSW Department of Primary Industries or the user's independent adviser. Inclusion of an advertisement or sponsor's symbol in this publication does not necessarily imply endorsement of the product or sponsor by NSW Department of Primary Industries.

Australian Citrus Growers Conference

13–15 October 2008 Field tour report

Sandra Hardy, Industry Leader Citrus, NSW DPI Gosford.

Citrus High Density Management with Dwarfing with Mario and John Martin – Yoogali

The Martin brothers own several properties, the first 19 hectares of citrus at Yoogali was purchased in 1937 by their father. In 2004 they converted part of the property from flood irrigation to drip. The drip irrigation system uses about 3.5–4 ML/ha. The ground is deep ripped annually to a depth of 300 mm along the tree rows to help the water penetrate the soil (Figure 1).



Figure 1. The ground is deep ripped annually to a depth of 300 mm along tree rows to improve water penetration into the soil.

They first used dwarfing about 10 years ago on 2–3 blocks as a test. The block visited on the conference field trip was planted in 1998 with Washington navels on trifoliata rootstock and Spanish navels on citrange rootstock. The trees were inoculated with buds containing the dwarfing viroid in spring 1999 and some trees where the buds failed were re-inoculated in the following autumn.

Normally after viroid dwarfing in research trials in Australia there is a reduction in scion trunk cross-sectional area, tree height, canopy volume and yield.

There is a positive relationship between tree yield and canopy size, however there should be no effect on cropping efficiency or yield efficiency.

The trees on trifoliata rootstock, now about 9 years old were much smaller than expected. It came to light that this was a replant site — which would also have an effect on tree size. Therefore the smaller than expected tree size could be attributed to the combination of a replant soil, the use of trifoliata rootstock (a naturally dwarfing rootstock) and the use of the viroid dwarfing inoculation. Therefore it is important when considering whether to inoculate trees with the dwarfing viroid — to take into account both the previous site history as well as the rootstock choice. The trees on citrange rootstock were a little larger because it is a more vigorous rootstock. (Figure 2)



Figure 2. Nine year old dwarfed Washington navels on trifoliata rootstock (left) and citrange rootstock (right).



Figure 3. Nine year old dwarfed Washington navels on trifoliata rootstock.

Alan Harrison who has been inoculating trees with the viroid dwarfing buds over many years recommends that when inoculating trees on trifoliata rootstock in replant

soils that the inoculation be undertaken slightly later at between 2–3 years after planting so that the trees are a good size before inoculation. The time of inoculation influences the extent of the dwarfing response, the earlier it is done the greater the dwarfing response. It is normally recommended that citrus trees be inoculated within 6–18 months of field planting because the dwarfing effect is reduced when inoculation occurs after this period. There will be little dwarfing effect, if any, on trees inoculated 4 or 5 years after planting.

For more information on dwarfing refer to Primefact 704, Dwarfing citrus trees using viroids available on the NSW DPI website at www.dpi.nsw.gov.au.

Demonstration of the Nelson mechanised orange harvester at Alan Harrison's property, Stanbridge.

Alan's 60 hectare property has extensive plantings of common oranges planted in 2002/03 for the fresh juice market, and include Salustiana, Hamlin, Pineapple, Parson Brown and Pera. They were planted at a 2 x 5 m spacing with the view of using mechanical harvesting. Alan also inoculates some varieties with the dwarfing viroid.

Andrew Nelson designed and built his own nut harvesting equipment when he grew walnuts and almonds. He then moved onto developing a vibrating rod straddle harvester for olives. In 2007 he started making modifications to this machine and trialling it for harvesting juicing oranges.

The machine was built from the ground up to harvest olives and this is the first year of use in oranges. It has two operators, one to steer and one to operate the picking heads. The machine currently has a 5 tonne bin. The machine is backed into the centre of the tree and then there is a series of movement waves and the rods dislodge the fruit as the machine moves up the row. By a series of elevators the fruit is deposited into the bin (Figures 4–10). Andrew hopes to build a 8–10 tonne side tipper to empty the 5 tonne bin into. Currently the harvesting machine does 5.5 tonnes/hr and the hire costs are \$465/hr + fuel costs. He would like to be able to harvest about 10 T/hr to reduce the hire fees to about \$50/tonne harvested fruit.

The machine has been used during August–September on Hamlin, Salustiana, Pineapple and Parsons Brown oranges on a contract basis at Hillston and Forbes. They normally prefer not to harvest when the trees are flowering in case it affects next years fruit set. To achieve high fruit recovery the fruit must be suitably mature, the



Figure 4. The Nelson orange harvester harvests 5.5 tonnes of fruit per hour.



Figure 5. The Nelson orange harvester requires two operators.



Figure 6. A series of rods gently move through the tree and dislodge the fruit.



Figure 7. The machine moves up the tree row.



Figure 10. Harvested Pera oranges.



Figure 8. The Nelson harvester.

orchard appropriately laid out and maintained (trees with low branches are not ideal) and the weather fine. At the time of the conference the harvester hadn't been used on Valencia oranges but will be trialled this season.

For the demonstration the harvester was used on Pera orange trees. For this variety they have to hit the trees a bit hard to get the fruit off and they really don't know if this will have any long term effects on the tree. Looking at the bins of fruit harvested at the demonstration – the harvested fruit appeared in very good condition and not a lot was left on the trees.

Andrew can be contacted on 0429 853 096.

Efficient furrow irrigation at Vince Costa's property, Whitton.

Vince purchased the 70 ha property 18 years ago, and it is planted with common oranges, Washington and Late Lane navels and Valencias

Trees are skirted and pruned (hedged) every year and production is 60 t/ha for 33 year old trees. Water application rates are around 4.5 ML/ha using twin furrows along the tree rows.



Figure 9. A series of elevators and chutes deliver the fruit to the 5 tonne bin.



Figure 11. Twin furrows are used to deliver water to the trees.

Every block on the property was surveyed, laser levelled and had 5 t/ha of gypsum applied. During the levelling of a 20 hectare area around 4000 m³ of soil was moved and 120 m³ of soil was removed.

Siphons are used to fill up the furrows along the tree rows and the water sits in the furrows which are deep ripped (to a depth of 300 mm) to help with water penetration into the soil.

Vince waters every 7–10 days in summer and every 14 days in winter and each block is watered for 12 hours, so that trees get a slow drink. During January and February



Figure 12. Siphons are used to deliver water from the irrigation channel to the twin furrows.



Figure 13. The 1.2 km storage channel constructed to collect and recycle irrigation water on Vince's farm.

calcium nitrate (50 kg/ha) is applied at every 2nd irrigation.

All the irrigation water on the property is recycled. After watering the runoff and drainage water are collected using a system of pits and channels. All paddocks drain to the eastern side and then the water moves into a 1.2 km channel which also catches the drainage water. In doing this Vince can save up to one megalitre of water every time he irrigates.

Growing citrus in China

Gary Eyles, citrus nurserman and Vice-President Nursery & Garden Industry NSW & ACT (NGINA)

I have just returned from a visit to China and some of my impressions may be of interest to others. My section of horticulture citrus, is an area that China has been greatly expanding in recent years. This has not just happened, they have planned this over many years. For quite some time Chinese academics have studied horticulture and citrus in particular at various institutes and organisations around the world. Australia has trained some of these and there is a strong link between Australia and China in the citrus world. Professor Zhou Changyong studied and trained with Pat Barkley, Australia's world renowned Citrus Pathologist. Zhou is now Director of the Citrus Research Institute, Chinese Academy of Agricultural Sciences in Chongqing.

The Chinese citrus industry has been reorganised from thousands of family based small area farms to

well organised extremely large corporations. These corporations supported by the government are focused on large developments. All propagation material is tested for disease and produced under protocols similar to many certification schemes around the world. Nurseries are large, producing from 800,000 to 2,000,000 trees a year. At present China has 1.8 million hectares planted to citrus orchards. This is the largest area for any one country and represents 27% of the world's area planted to citrus. They are second in output to Brazil but I am sure they will overtake Brazil in the next few years to become the largest producer. Currently China produces 18 million tonnes of fruit a year which is 18% of the world's output.

As an example of how well they are organised I will try to explain the structure of the Ganges Fruit Group. Remember there is government support at all levels and nothing happens without party approval. The advantage in their system is that once they decide its going to

happen then it will happen – even if 10,000,000 people need to be moved.

In the Ganges Fruit Group there are three sections in the business.

1. New varieties, technology, modern nursery (33 hectares in total), demonstration farm (160 hectares) and variety evaluation.
2. Tree supply to grower co-ops and other land owners, along with the development of 12,000 hectares of their own orchard aimed at late season citrus varieties.
3. Packinghouse with cold storage facilities to supply over 500 domestic distributors and in excess of 40 international countries.

They travel the world picking up technical know how and forming alliances. The objective of this particular corporation is to become an industry leader and be the largest late season citrus company in China and Asia within 10 years.



From a purely nursery perspective their system is simple but effective. They have no need for labour saving machinery because the government is encouraging these developments to provide employment. The system begins when rootstocks are grown from seed in a greenhouse. These are transplanted into a container in outside beds where they are either chip or t-budded and then grown on in situ until ready for dispatch then loaded and supplied direct to the orchard site. There is a definite hierarchy in the corporation. It would be impossible to start as a peasant labourer and end up running the operation. Having said that all staff seemed happy in their work.

The other thing that stood out to us was that the research institutes were full of young educated very enthusiastic researchers. This only happens when the government and industry work together to support these institutes.



Our government seems more intent on closing down scientific research rather than supporting our institutes and experienced researchers. It would be of value for our policy makers to see how a strong research base can lead to a healthy vibrant industry.

As always its good to see our industry in other parts of the world and compare the systems whether good or not. It is always good though to come home in the knowledge we still live in the best part of the globe.

John F. Morrissey and Company, lawyers

Specializing in employment law as it applies to orchardists, packing shed operators and other rural employers.

02 9331 0266

Fax: 02 9331 0277

jmorrissey@johnfmorrissey.com.au

**First Floor, 40 Macleay Street
Potts Point 2011**

www.johnfmorrissey.com.au

Scoping study to identify and quantify factors to improve summerfruit quality and consistency



John Golding and Sandra Hardy, NSW DPI, Gosford.

This is the technical summary extracted from the final report with additional information from the trial work done on the Central Coast.

Introduction

Meeting consumers' expectations of summerfruit is paramount for the Australian summerfruit industry. Providing consumers with consistent high quality eating experience is essential for repeat purchases and increasing per capita consumption. A major problem with meeting consumer expectations is the variability between fruit within the same tray / box, as there can sometimes be large differences in fruit sweetness (soluble solids content, SSC) between different fruit. A first step towards solving this problem is to identify and quantify this variability in fruit SSC and then begin to identify some of the factors that influence SSC. This is only a preliminary scoping study with limited field and market surveys in one growing season (2007/8). This data only provides a snapshot of the fruit at sampling times on limited orchards, varieties and orchard management conditions so limited conclusions could be drawn.

Methods

The variability of fruit SSC was measured in a range of different peach and nectarine varieties grown in three growing regions around Australia; low chill (Northern NSW), medium chill (NSW Central Coast), high chill (Tatura, Victoria).

Fruit SSC was measured using the non-destructive near infrared (NIR) spectroscopy (Figure 1). This method is non-destructive, meaning that you do not have to take a juice sample to measure fruit SSC. This new technique allows the measurement of fruit SSC on the same fruit in the orchard during fruit growth and development. This has tremendous potential for not only the summerfruit industry, but in all of Australian horticulture. The portable NIR was calibrated several times during the season to ensure accurate results.



Figure 1. Use of portable non-destructive NIR to measure fruit SSC in the orchard.

Fruit SSC and size (fruit diameter) was measured in a range of orchard and packingshed surveys which were conducted in each of the growing regions during the harvest period. In addition, a survey of summerfruit SSC was conducted during the season from November to February 2008 in wholesale and retail markets in the Sydney region.

Results

These results show for the first time the range of fruit SSC within and between different growing regions and in the wholesale / retail market across the 2007/8 summerfruit season. The results from the low and medium chill growing areas showed there is tremendous potential to increase both the average SSC and to minimise the fruit to fruit variability. The overall fruit SSC in the low chill and medium chill growing regions in the 2007 season was low. The poor climatic conditions before harvest (cloudy and rainy) were not conducive to good sugar accumulation in the fruit in that season. The summerfruit from the higher chill growing regions generally had higher fruit SSC, but there were still issues with low and variable SSC identified in the market. However significant inter- and intra-tree variability existed. Fruit were also sampled at wholesale and retail markets and the variation in fruit SSC across the entire 2007/8 summerfruit season was large. Individual fruit SSC values ranged from 5.7% in yellow nectarine from medium chill growing area



Measuring fruit SSC from the orchard lugs of different pickers in the field.

in November and up to 17% in a medium white flesh nectarine in January. The median (middle) value of all 700+ SSC measurements from the wholesale / retail market survey over the sampling period from November 2007 to February 2008 was 9.6%.

Medium chill region – Central Coast / Sydney Basin, NSW

1. Effect of picker on fruit to fruit SSC variability

(i) White Satin nectarines

Fruit were measured from the orchard lugs of five different pickers three times on 5 November 2007.

The results show that there were no significant differences in the size of the fruit harvested by each of the five pickers, ie all pickers harvested the same sized fruit (55mm). Likewise there were no statistical differences in the SSC of fruit harvested by different pickers (Table 1).

Table 1. Average fruit SSC and fruit diameter of White Satin nectarines harvested by different pickers from the same trees / rows.

Picker	Average fruit SSC%	Average fruit diameter (mm)
Picker 1	8.9	55
Picker 2	8.8	55
Picker 3	9.0	55
Picker 4	8.6	55
Picker 5	9.0	55
No significant differences between pickers		

(ii) Diamond Bright nectarines

Fruit were measured from the lugs of three different pickers, 5 times on 29 November 2007.

The results show that there were no significant differences in the size of fruit harvested by each of the three pickers, ie all three pickers' harvested similar sized fruit. Likewise there were no statistical differences in the SSC of fruit harvested by the different pickers. Although Picker 3 harvested fruit with an average SSC of 10%, this was not significantly different to the other pickers (Table 2).

Table 2. Average fruit SSC and diameter (mm) of Diamond Bright nectarines harvested by different pickers from the same trees / rows.

Picker	Average fruit SSC%	Average fruit diameter (mm)
Picker 1	9.4	65
Picker 2	9.6	65
Picker 3	10.0	66
No significant differences were detected		

2. Effect of position of the fruit within the tree on fruit to fruit SSC variability

(i) White Satin nectarines

Fruit SSC and diameter were measured on 5 November 2007. There was no difference in the fruit size (diameter) between the different orientations (east or west) within the tree; but there was a significant difference in fruit SSC from the location of that fruit on the branch (exposed and shaded). Fruit in exposed positions had higher SSC levels (average SSC 9.0%) than those fruits in shaded positions (average SSC 8.4%) (Table 3). There were no differences in fruit SSC between the two different branch orientations (east or west facing branch).

Table 3. Average fruit SSC and diameter (mm) of White Satin nectarines from 12 trees assessed at different locations and orientations within each tree.

Location	Average SSC%	Average diameter (mm)
Exposed + West facing	8.9 ^a	53
Exposed + East facing	9.0 ^a	54
Shady + West facing	8.4 ^b	53
Shady + East facing	8.4 ^b	51
Letters following the means indicate fruit SSC values were significantly different (5% level). There was no significant difference between fruit diameter values.		

(ii) Diamond Bright nectarines

Fruit SSC and diameter were measured on 22 and 29 November 2007.

There were no significant differences detected between the fruit sizes (diameters) or assessment times within the Diamond Bright fruit on the tree. However a significant difference in fruit SSC between assessment times was measured (Table 4). In addition, there was a significant interaction of fruit SSC between assessment time and position within the tree (Table 4). At assessment time 1 (22 November 2007) there was no significant difference in fruit SSC between fruit from the east or west-facing branches.

However by assessment time 2 (29 November 2007), the fruit from western-facing branch had significantly lower SSC than fruit from eastern-facing branches.

Table 4. Average fruit SSC and diameter (mm) of Diamond Bright nectarine trees assessed at different times and at different locations within each tree.

Location	Average fruit SSC%	Average fruit diameter (mm)
Assessment 1 (22/11) + West facing	9.2 ^a	59
Assessment 1 (22/11) + East facing	8.9 ^a	58
Assessment 2 (29/11) + East facing	8.0 ^b	58
Assessment 2 (29/11) + West facing	6.9 ^c	58

Letters following the means indicate fruit SSC values significantly different (5% level). There was no significant difference between fruit diameter values.

3. Changes in fruit to fruit SSC variability over time

The variability in fruit SSC of Spring Sweet and Spring Bright nectarines was monitored by testing the same fruit over the final weeks of growth and development.

Table 6. Summary of fruit SSC (and diameter) measured in the packingshed of a range of summerfruit varieties on the NSW Central Coast during November – December 2007. The average SSC and fruit diameter (mm) is shown with the standard deviation around the mean in brackets.

#	Variety	Count	SSC	Diameter	#	Variety	Count	SSC	Diameter
1	White	39	9.7 (1.3)		2	Diamond	28	9.8 (1.3)	73 (1.3)
	Satin	45	9.8 (0.5)	59 (1.3)		Bright	28	9.7 (1.4)	71 (1.3)
	nectarine	50	9.4 (0.6)	58 (2.2)		nectarine	33	9.2 (0.9)	70 (1.4)
		50	9.2 (0.8)	58 (1.6)			33	8.7 (0.6)	70 (1.9)
		54	9.2 (0.7)	55 (1.5)			35	8.8 (0.8)	66 (2.1)
		54	9.0 (0.7)	55 (1.3)			35	9.1 (1.0)	65 (1.5)
2	Rose	28	9.6 (1.4)	72 (1.3)			39	8.0 (1.0)	63 (1.2)
	Diamond	35	8.4 (1.8)	64 (3.7)			39	8.7 (0.7)	63 (1.4)
	nectarine	39	8.3 (0.8)	63 (1.0)			45	8.1 (0.8)	60 (1.8)
		45	8.6 (1.2)	61 (1.0)			45	8.0 (0.8)	60 (1.7)
		45	7.1 (1.3)	60 (1.6)	1	Peach	bulk	8.5 (1.0)	

Table 5. Average fruit SSC and diameter (mm) of Spring Sweet nectarine trees assessed at different times and at different locations within each tree.

Location	Average fruit SSC%	Average fruit diameter (mm)
Assessment 2 (29/11) + West facing	8.9 ^a	57 ^y
Assessment 1 (22/11) + West facing	9.1 ^a	53 ^x
Assessment 2 (29/11) + East facing	9.1 ^a	57 ^y
Assessment 1 (22/11) + East facing	9.2 ^a	53 ^x
Assessment 3 (3/12) + East facing	10.3 ^b	63 ^z
Assessment 3 (3/12) + West facing	10.7 ^c	62 ^z

Letters following the means indicate fruit SSC or fruit diameter values were significantly different (5% level).

All the fruit from two fruiting laterals (nominally east and west orientation) were tagged on ten representative trees of each variety and measured on 22, 27 November and 3 December 2007. Up to 9 fruit per lateral for Spring Sweet and up to 7 fruit per lateral for Spring Bright were measured at each survey time.

(i) Spring Bright nectarines

Fruit SSC of Spring Bright nectarines was monitored at weekly intervals for three weeks prior to harvest with assessments on 22 November, 27 November and 3 December 2007.

Each Spring Bright nectarine tree was divided into east- and west- facing branches and the fruit SSC non-destructively measured with NIR. There was no significant difference between sampling time or position within the tree; all fruit SSC were statistically similar.

Fruit size (diameter) of Spring Bright nectarines was also monitored at weekly intervals for three weeks prior to harvest, on 22 November, 27 November and 3 December 2007. Significant differences in fruit size were detected between the three sampling times, with fruit diameter increasing over time, ie the fruit was growing. No significant differences in fruit diameter were detected between the positions within the tree. Additionally there was also no interaction between position and assessment time, ie the increase in fruit diameter was consistent regardless of its position (east or west facing) on the lateral.

(ii) Spring Sweet nectarines

Fruit SSC of Spring Sweet nectarines was monitored at weekly intervals for three weeks prior to harvest on 22 November, 27 November and 3 December 2007.

Each Spring Sweet nectarine tree was divided into east- and west- facing branches and the fruit SSC non-destructively measured with NIR. The results showed there was a significant difference in fruit SSC between the assessment dates. There was no difference in fruit SSC as a result of position within the tree.

Significant differences in fruit diameters were detected between fruit at the three sampling times, with fruit diameter significantly increasing over time (Table 5). No significant difference in fruit diameter between positions, or the interaction between position and time was detected. The increase in fruit diameter was consistent regardless of position (east or west- facing) of the lateral.



4. Survey of summerfruit from packing sheds in medium chill growing region on the NSW Central Coast

A summary of the results of a survey of summerfruit produced in the medium chill region on the NSW Central Coast is presented in Table 6. The results are the averages of 10 or 20 individual fruit and show that the average SSC of all fruit surveyed were less than 10% SSC.

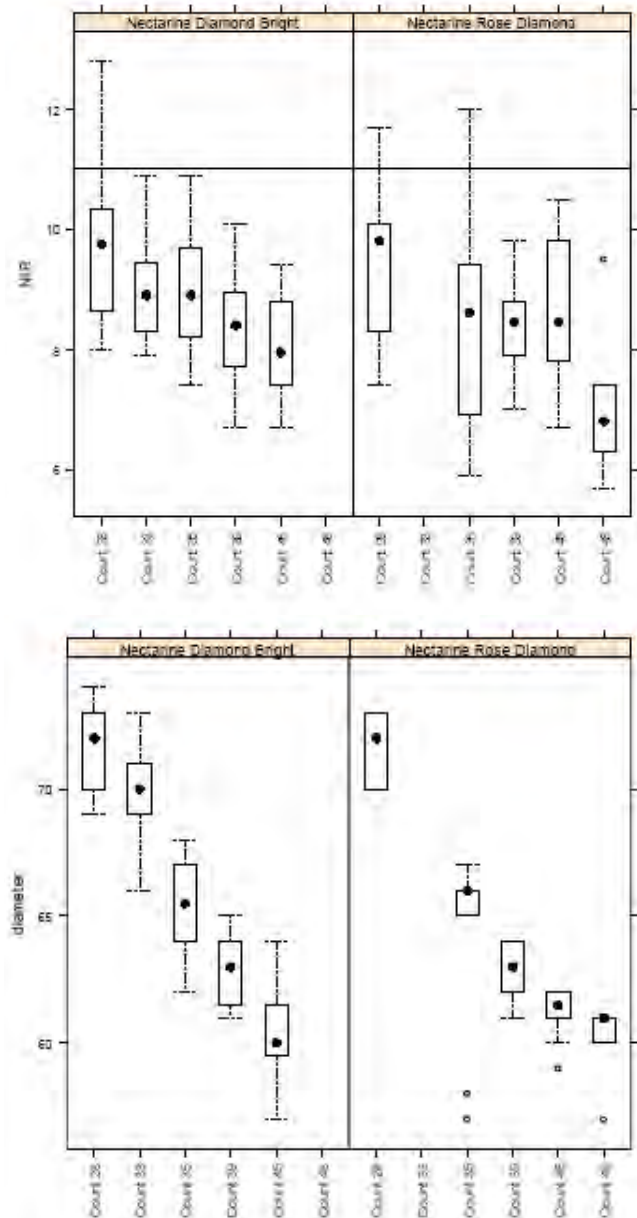


Figure 2. Box plot of fruit SSC as measured with NIR (left panel) and fruit diameter (right panel) in packed boxes of different counts of Diamond Bright (left) and Rose Diamond (right) nectarines. The data shows the range of values, inter-quartile range and the median.

However just focussing on average SSC can be misleading. For example the average SSC of twenty Diamond Bright nectarines (Count 28 fruit) was 9.8% (with a standard deviation of 1.3) however the range of fruit SSC ranged from 8.0% up to 13.0% SSC (Figure 2).

These results show there are significant opportunities to manage fruit SSC and reduce fruit to fruit variability in summerfruit produced on the Central Coast. More work is required to improve the genetics of low-medium chill summerfruit and to identify and manage orchard factors to increase fruit SCC.

This project (SF06013) was funded by the Summerfruit levy facilitated by HAL in partnership with Summerfruit Australia. The Australian Government provides matched funding for all HAL's research and development activities.

Vertebrate pest control workshop – Report

Sandra Hardy, Industry Leader Citrus, NSW DPI Gosford.

As part of the Central Coast Plateau Sustainable Farming project, a workshop on vertebrate pest control was held on 12 November at the NSW DPI Somersby Research Station. Richard Ali (Senior Ranger Pests) from the Department of Environment and Climate Change (DECC) and Luke Booth, Ranger with the Rural Lands Protection Board (RLPB), provided participants with a good overview of the main pests animals, options for control and the roles and responsibilities of both landholders and government agencies.

Main pest animals

These include foxes, wild dogs, goats, rabbits, pigs, feral cats and wild dogs. These pest animals cause livestock death, property damage; can be a biosecurity and human safety risk and also affect our native animals, especially the smaller mammals. Declared pests which must be controlled are wild rabbits, wild dogs and feral pigs. All landowners have an obligation to suppress and destroy these declared pests.

Roles and responsibilities of landholders and government agencies

Table 1. Summarises the key areas of responsibility for the different agencies with regards to control of pest animals.

Agency	Responsibility
Department of Environment & Climate (DECC) which includes the National Parks & Wildlife Service (NPWS)	Management of pests on NPWS estate
Local government	Assist and support rate payers
Rural Lands Protection Board (RLPB)	Assist and support rate payers Eradication of declared pest animals
Private land owners	Management of pests on their own land

Rural Lands Protection Board (RLPB)

The RLPB is currently undergoing a number of changes. One of these is a reduction in the number of boards of directors from 47 to 14 and a realignment of board

Figure 1. New RLPB boundaries



boundaries (Figure 1). The new boards are expected to begin operation on 1 January 2009. The organisation will be renamed to better reflect its core biosecurity function as it works with landholders to minimise the effects of disease and pests on agricultural production in NSW. The number of field staff including vets and rangers will remain the same but their regional boundaries and location may change. Figure 1 outlines the new RLPB regions. For more information contact the RLPB Council on 02 6391 3242 or logon on to www.rlpb.org.au

European Red Foxes

The fox was introduced into Australia in the early 1870's and its spread quickly followed the distribution of rabbits across the mainland. Foxes have a lifespan of between 3–6 years, breed once a year between April and July and the cubs are born during August and September. Foxes are opportunistic feeders and eat almost anything including



fruit, meat and insects. Nearly a third of their diet can be made up of livestock and poultry.

There are many options for control including trapping, baiting, fencing and stock guards. Foxes have a behavioural trait called 'caching' or burying their food in various spots within their territory for later consumption. This particular trait is used when undertaking a baiting program.

Baiting (using '1080') is the primary technique used to control foxes. '1080' is a natural substance that occurs in several species of Australian plants. Native animals that have grazed on such plants have evolved a degree of tolerance to its effects. Native animals need to eat a lot of '1080' to be affected. '1080' is 100% biodegradable and breaks down relatively quickly in the field through bacterial and mould action. '1080' baits should be buried to reduce off-target impacts. The RLPB provides advice and supply of '1080' baits.



Baits should be anchored down, buried and sand can be used to check animal tracks around the bait station.

'1080' is now a restricted chemical under a Pest Control Order October 2008. Anyone using it must have a recognized chemical accreditation such as AQF3. There

have also been changes to the distance restrictions for foxes and dogs and changes to signage requirements. For more information contact your local RLPB officer.

Rabbits



Rabbits compete with native animals for food and shelter, cause soil erosion through overgrazing and burrowing and reduce native plant regeneration. They are also a food source for other pest animals such as foxes and feral cats.

Rabbits are sexually mature at 3-4 months, have 3-6 kittens at a time and have a gestation period of around 30 days. This means that a single female can produce up to 40 offspring per season.



Animal traps can be hired from the RLPB or NPWS.

Control methods include trapping, baiting, fencing, warren destruction and the introduction of diseases such as rabbit haemorrhagic disease (RHD) and myxomycetous. RHD hasn't worked as well on the coast as it has in the inland western regions. They believe the

reason for this is that these rabbits may have already had a strain of RHD and so already have some natural immunity to RHD.

The primary control method employed is baiting using Pindone (an anticoagulant) treated carrots or oats. A baiting program begins with one to two “free feeds” of non-poisoned carrots or oats, followed by 2–3 feeds of Pindone treated carrots or oats 4 days apart. The RLPB can assist you with planning an effective rabbit control program.

Wild dogs



Wild dogs are declared pest animals throughout NSW under the RLP Act and there is a statutory obligation to control them. Dogs are opportunistic feeders. Wild dogs can also carry diseases such as the hydatid tapeworm — so always wear gloves if you have to handle them.

Wild dogs normally mate between March and May with whelping occurring between September and November. Trapping, baiting and de-fumigation are common methods of control. Another new approach being trialled is the use of ‘stock guard’ animals such as alpacas, lamas, donkeys and goats which can be useful in protecting livestock and as an early warning system.



‘Stock guard’ animals such as lamas can be used to protect farm animals and as an early warning system.

Experience has shown that wild dog control is more effective if action is taken over a wide area in a coordinated campaign, rather than on a single property basis. It may also require the use of several control strategies. Contact your local RLPB for assistance in planning a wild dog control program.

Wild deer



In this region wild deer mostly include fallow and red deer. Deer were introduced into the region through the release of domestic herds.

The Game Council NSW, created under the Game & Feral Animal Control Act 2002 has introduced a state-wide licencing system for hunting deer in NSW. However, farmers and their employees hunting on their own land are exempt from the NSW Game Hunting Licence System.

There are still many regulations when hunting deer including: deer cannot be hunted at night, spotlights or artificial light sources cannot be used nor can baits, lures or decoys. For more information on the other regulations with regards to hunting deer contact the NPWS or RLPB.

For more information on vertebrate pest control contact Luke Booth (RLPB) on 0408 681576 or Richard Ali on (02) 4320 4241.



Climate risk workshop – Report

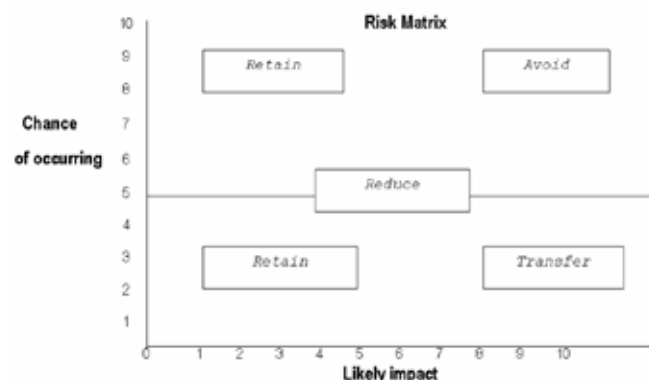
Sandra Hardy, Industry Leader Citrus, NSW DPI Gosford.

As part of the Central Coast Plateau Sustainable Farming project, the Profarm workshop titled “The Farmers Guide to Managing Climate Risk” was held on 19 November at the NSW DPI Somersby Research Station. Project Officer, Carolyn Jenkinson of the Central Coast Plateau Sustainable Farming project will be holding two more of these workshops in 2009. Carolyn can be contacted on 02 4348 1979 or by email on carolyn.jenkinson@dpi.nsw.gov.au

The workshop was presented by Michael Cashen, Climate Risk Management Project officer with NSW DPI. The full day workshop included sessions on risk management, how the weather works, seasonal influences on the weather and the changing climate. The workshop was very informative and if you get an opportunity to attend one I thoroughly recommend it. The following report was just some of the information presented at the workshop.

Risk management

Climate variability has an enormous impact on agricultural production in Australia and is a major source of risk. As with other risks in a business you need to put in place steps to manage climate risk. To do this you need to evaluate the probability or likelihood of the risk occurring and the impact or consequences on your business; develop strategies to minimise the impact (avoid, reduce, retain or transfer) and then develop strategies to manage this risk.



The weather

High and low pressure systems

The weather is what you get and climate is what you expect. The heat from the sun drives our global weather

system. Due to the earth's tilted orientation to the sun, different parts of the earth are exposed to the sun's energy at different times and this is what gives us our seasonal patterns (Figure 1).

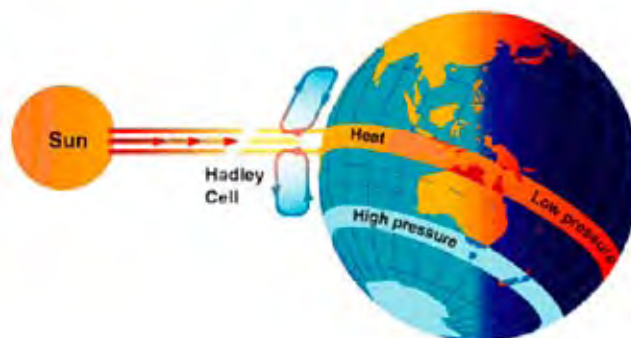
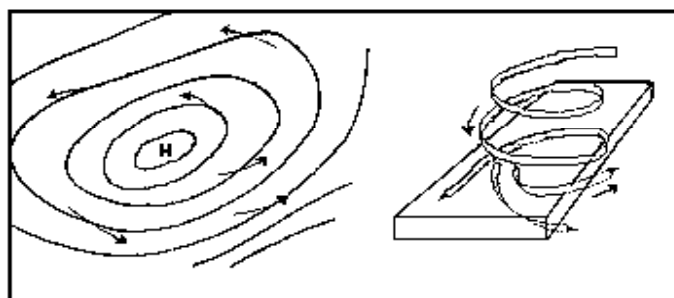
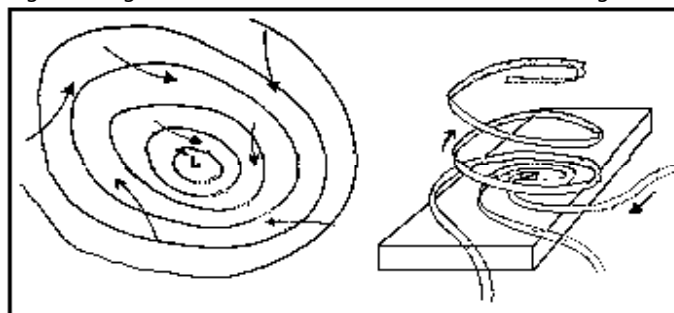


Figure 1. Hadley Cells generate equatorial troughs of low pressure and subtropical ridges of high pressure.

The regions of the earth nearest the sun, such as the equator receive most of the sun's energy. Here warm air rises (forming an area of low pressure at the surface) and moves towards the poles, cooling as it goes. At about 30° South in the mid latitudes the now heavy cool air descends (forming an area of high pressure at the surface). NSW is situated in this area. The descending cool air moves outwards towards areas of relatively lower pressure to try and equalise the air pressure, and this movement of air is what makes wind.



Highs are big, flow anti-clockwise and down and drive changes.



Lows are small, flow clockwise and up and receive changes.

Figure 2. Air movement in high pressure (top) and low pressure (bottom) systems in the southern hemisphere.

In the southern hemisphere the air in high pressure systems is descending and moving in an anticlockwise direction whilst the air in a low pressure system is moving upwards in a clockwise direction (Figure 2). The location of pressure systems can give you a good guide to what weather will come with the wind. Air coming off a warm ocean can bring moisture and air from the inland parts of Australia will be dry. Air coming from the Antarctic will be cold and air from the north warm.

There is a seasonal shift in the path of these high pressure systems over Australia with a corresponding shift in the latitude of cold fronts as triggers for rainfall. In winter the high pressure systems sit almost over Australia and in summer the highs are much lower sitting more over the bottom of Australia. High pressure systems are generally big and slow moving whilst lows are smaller and faster.

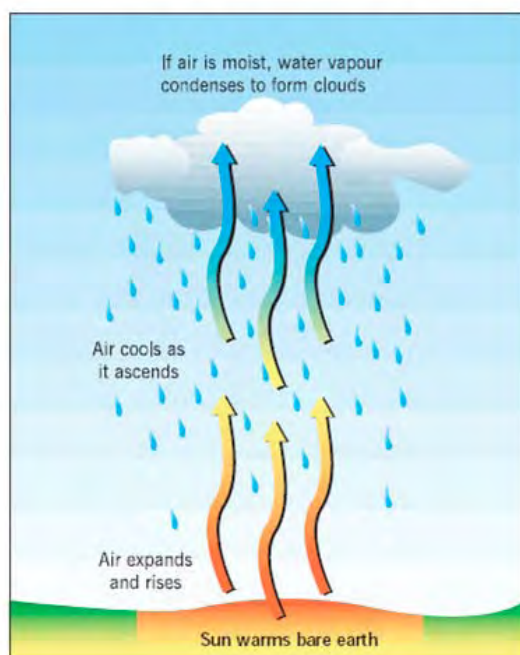
Where you are in relation to the centre of the high pressure system can be a good guide to what weather is coming your way.

Rainfall

Two factors are required for rain, a source of moisture and a trigger. The major carriers of moisture into NSW producing significant rainfall events include:

- Monsoons & cyclones in tropical regions – a summer phenomenon requiring a warm sea surface.
- North west cloud bands from northern India – bands formed off the coast of WA, moving southwest usually in autumn/winter.

How Convection Works



- 30–50 day waves, intra seasonal oscillations or MJO – irregular waves of low pressure sweeping west to east across northern Australia bringing tropical moisture.
- Cold fronts pushing up from the Antarctic – mainly in winter.
- Trade winds from across the Pacific into north eastern Australia – associated with the southern Oscillation Index and El Nino feeding a lot of moisture over eastern Australia.
- Tasman highs – high pressure systems in the Tasman sea bring moist easterlies onto the east coast, normally a source of moisture in winter/spring.
- Tasman lows – often in association with cold southerly winds bringing rainfall mostly to the mid coast and south east only.

In order for rain to form, moist air needs to cool. If moist air rises it will cool, about 0.65°C for every 100 m in elevation. If there is sufficient moisture and the air rises enough to form dense clouds there may be rain.

The main mechanisms (triggers) that make air rise and consequently may cause rainfall include:

- hills and mountains
- irregularities on the earth's surface
- air pressure systems colliding – cold fronts undercutting warmer air
- hot air uplift
- a circulating low

Other causes of cooling include, mixing with cooler air as two circulating systems interact; sunset, where the source of heating is removed and a trough of lower pressure where the air expands, spreading the heat and cooling slightly.

Climate variability

Australia is exposed to significant variation in rainfall both seasonally and spatially, compared with our agricultural competitors (Figure 3). There is no one cause of large scale climate variability, but a number of phenomena which operate at different time scales as indicated in Table 1. However the three major causes of large scale climate variability in NSW are the El Nino Southern Oscillation (ENSO), Indian Ocean Dipole (IOD) and Southern Annular Mode (SAM).

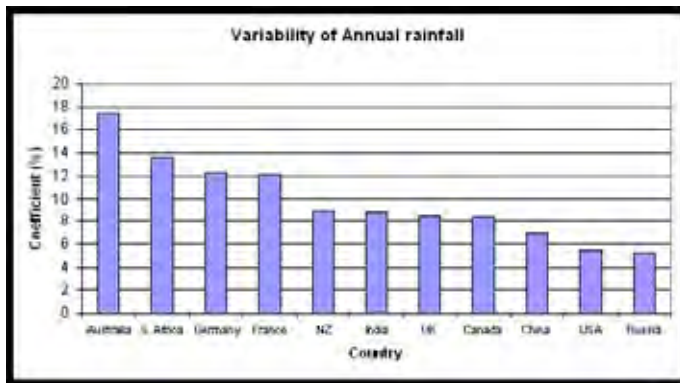


Figure 3. Annual rainfall variability for different countries.

Major cause	Approximate time scale
Synoptic daily weather pattern	Day/week
Southern Annular Mode	Weeks
Madden-Julian Oscillation	Month/s
Seasonal shifts in circulations and position of sub-tropical ridge	Seasonal
El Nino Souther Oscillation	Inter-annual
Indian Ocean Dipole	Inter-annual
Inter-decadal Pacific oscillation	Inter-decadal
Climate change?	Inter-decadal

Table 1. Phenomena affecting climate variability and the time scale they operate at.

Source: Bureau of Meteorology

Weather forecasts

Seasonal outlooks

The Australian Bureau of metrology issues seasonal outlooks for rainfall and temperature based on statistical correlations using historic records of sea surface temperature. The outlooks are expressed as a % chance of exceeding the historic median for a range of variables for the period specified. To access these follow the link to: www.bom.gov.au/climate/ahead/rain_ahead.shtml

Dynamic models

Dynamic forecasting uses well established laws of physics about the atmosphere and oceans and daily measurements taken across the world in the oceans and atmosphere with sophisticated sensors. This type of forecasting is in its infancy but it offers greater skill than current statistical models. To access the current version follow the link to:

www.bom.gov.au/climate/ahead/rain_ahead.shtml and click on further POAMA Forecasts experimental, then follow link to experimental products 1.5, select maps, then Australian rainfall anomaly.

Historical climate data

With some rainfall data using the average as a guide for a property or region can be misleading, because very big rainfall events can distort the average. It is often better to use the median - which is the middle point - where half the time rainfall has been above the median and half the time below the median. For most locations in Australia the median is less than the average. The number of years that have gone into producing the average or median is also very important. In order to analyse a location's rainfall accurately you need to use more than 50 years of rainfall records.

Climate change

Records indicate a clear and substantial change in global temperatures and there is strong suspicion and some evidence about rainfall changes and the frequency and strength of extreme weather events.

The data shows recent temperatures to be extreme in historical terms, certainly in the last 2000 years, but maybe longer. Data on atmospheric CO₂ levels collected from extracting and analysing the air trapped in ice cores from the north and south poles, as well as from samples taken directly from the atmosphere show current levels of CO₂ are way above any historical value. What we are seeing with regards to climate over the last 100 years is not caused by any factor which has driven any of the previous historical variation — it is something new, something we are causing.

The problem is that these changes have been going on for decades but we have only just caught up with what is happening.

The Intergovernmental Panel on Climate Change (IPCC) released its 4th assessment on global climate change in 2007 – it can be viewed at www.ipcc.ch/.

The Australian Greenhouse Office commissioned the CSIRO and the Bureau of Meterology to prepare a report on climate change in Australia , this can be viewed at www.climatechangeinaustralia.gov.au.

Useful websites on climate and weather information

Bureau of meteorology– www.bom.gov.au
Weather Zone – www.weatherzone.com.au

Grafting vision speeds apples

Source: Agriculture Today, 30 October 2008.

Scientists at the Orange Agricultural Institute (OAI) have come up with a simple plan which could save the apple industry millions of dollars and boost production well into the future.

A research team has started an innovative trial to evaluate the effectiveness and cost of reworking high density apple orchards.

“We aim to demonstrate to growers how they can replace old trees with new varieties, return the orchard to full production within two years and save money by retaining expensive infrastructure,” NSW Department of Primary Industries temperate fruit industry leader, Dr Shane Hetherington, said.

“Most orchards are now taking advantage of high density production and we’re planning ahead to give them money saving options when, every 10 years, they replace trees.”



Rather than knocking out old trees and replacing expensive irrigation and trellis systems, Dr Hetherington proposes that the trees be top-worked with new varieties.

“We are grafting new varieties onto the old rootstock, so not only are we keeping the valuable infrastructure, we’re also giving the new grafts a kick-start on an established root system,” he said.

“We have trees at OAI which will produce fruit this season, just 12 months after grafting, and we predict they will return to full production next year.”

High density systems offer significant production benefits – higher yield potential per hectare, uniform high quality fruit and easier harvest, canopy and pruning management – but newly planted trees usually take three to four years to reach full production.

NSW DPI’s future vision for the apple industry embraces the development of a national integrated pest

management (IPM) strategy which Dr Hetherington is developing.

“Horticulture Australia Ltd has entrusted us to give growers environmentally-friendly and safe IPM practices which will allow them to produce the quality fruit demanded by local and overseas consumers,” he said.

“Another Horticulture Australia project at the Institute which will boost IPM and the future of the industry is a woolly aphid-resistant, dwarf rootstock trial.

“Growers will have the benefit of growing easy to manage, space-saving trees which are resistant to woolly aphid, one of the most devastating apple pests.”

Contact Dr Shane Hetherington, Orange, (02) 6391 3860 or shane.hetherington@dpi.nsw.gov.au

Retain[®] as a management tool for low chill stone fruit varieties: an update

Source: Low Chill Stonefruit Grower, November 2008

Phillip Wilk, District Horticulturist, NSW DPI, Alstonville

Low chill stone fruit is traditionally the first fruit of the season and is produced in the coastal regions of northern NSW, southern QLD and the NSW Central coast. The cost of production of low chill stone fruit is much greater per unit (tray) than the cost of stone fruit from the higher chill regions such as Stanthorpe, Orange and the Goulburn valley. Growers of low chill stone fruit therefore need to receive greater returns per tray than their counterparts in cooler regions to stay viable.

As reported in the November 2006 LCA newsletter, a trial was conducted during the 2006 growing season on a grower's property in northern NSW with the commercial product Retain[®]. This product is a commercial plant hormone spray that is commonly used on a number of soft fruits to allow some grower flexibility. Readers will be familiar with the subsequent technical notes included in following newsletters.

The aim of the trial was to apply a number of post harvest treatments and use Retain[®] on a variety of nectarine that is usually very difficult to manage and pick as it develops soft tips but has shoulders that still remain green and unripe.

The variety tested was the early season white fleshed nectarine White Satin (90-3). When produced well, it generally commands very healthy prices, as it is well coloured sweet and early. It is the first nectarine produced in the season and normally

picks around early October. This variety, however, has a few negative characteristics, some of which are as noted above: it often develops a soft tip while the attachment end remains green and hard. It can also have a problem with developing to a reasonable and commercially acceptable size. Generally growers are able to produce fruit in the size range (old sizes 28–32 tray counts, new trays 45–42) 60–65 mm.

Unfortunately many growers pick the variety far too early to avoid the soft tip which means it has no flavour, is very small and has low sugar levels.

During that season we sprayed a number of White satin nectarine trees (24) with Retain[®] in four blocks (with controls), to assess how effective the product would be in allowing the fruit to size up, colour and gain flavour before picking. The experimental trees were treated the same as the rest of the orchard except for the Retain[®] treatment. Retain[®] was applied by backpack approximately 7 days before the estimated normal picking time of control trees. Retain[®] treated trees and control trees were picked and packed directly into trays with liners at two separate times (17th Oct, 23rd Oct).

It was obvious at the time of picking that the fruit that had been sprayed with Retain[®] was well coloured and large but was still firm with no soft tip. It was also obvious that the fruit was at least one size count above the control fruit without getting soft tip.

At that stage of the 2006 harvest, growers were receiving \$30/tray for fruit of 39 count and only \$23 /tray for fruit of 45–50 count (many were bulked into 10 kg boxes).

The cost of the Retain[®] was approximately \$1000 to treat one hectare. It was recommended it be applied with a surfactant called Maxx[®]. By costing in tractor costs and labour @ 20/hr the total costs for treating one hectare would be \$1100 \$1200.

Therefore for an outlay of \$1200/ha growers could expect a return of \$14,000/ha extra. The great advantage was that in the variety tested, wastage dropped from 20%–30% to less than 10%.

Retain[®] may be useful to stone fruit growers as a management tool in a number of ways. Firstly there must be a significant return for fruit of a larger count size for it to be cost effective. Secondly it may allow growers to manage difficult varieties, especially nectarines which are prone to soft tip and rain damage. Growers can use the product after their first pick to allow the second pick to size up and increase sugar levels before harvest without the fruit getting soft. Finally it dramatically reduces wastage that regularly occurs on many of the sensitive nectarine varieties.

The following 2007 and 2008 seasons have seen much increased adoption by growers of this particularly successful management strategy, and reports from those growers utilising Retain[®] continue to positively reflect its effectiveness in allowing an increased degree of crop manipulation, producing a far more acceptable product for market.

Its use has been expanded to now include several varieties of peach, nectarine and plum cultivars, with commensurate positive results.

Low chill stonefruit - Looking after your trees after harvest

Source: Low Chill Stonefruit Grower, November 2008

Dr A P George and R J Nissen, Qld DPI&F, Maroochydore.

Summer pruning

Summer prune two to three weeks after harvest. With early varieties, do this before mid-January and again in February if need to avoid any delays in flowering in the following season. The aim of summer pruning is to allow light to penetrate the tree. This ensures good flower bud development and induces the growth of new fruiting wood close to the leaders for the next season.

At summer pruning

- Remove strong water shoots in the tree centre. Leave weak lateral growth to protect limbs from sunburn.
- Top trees to framework height or reaching height for open vase.
- Remove some laterals if growth is excessive.
- Do not allow old fruiting wood in the body of the tree to develop into heavy branches. Where potentially fruitful new laterals have been produced along an old lateral, remove wood outside the selected new growth (Figure 1). Where there is no new growth, prune the old spent wood to a stub carrying two or three buds. These generate growth in the following few months and bear fruit the next season.
- Remove old fruit and dead shoots.
- Remove all growth, including suckers, within 500 mm of the ground.

Post harvest topping

Post harvest topping differs from summer pruning in that it involves pruning the tree back to the main scaffold branches. Post harvest topping has been used as a management tool to control tree size in low chill stonefruit (Crocker *et al.* 1982). Higher yields than can be expected with standard systems can be achieved. Young and Crocker (1982) recorded yields of 32 t/hectare with post harvest topped Flordagold. Post harvest topping can increase fruit size as much as 15%.

However, the major disadvantage with post harvest topping is the strong compensatory regrowth which



Figure 1. How to summer-prune laterals

follows topping. Due to delayed floral bud differentiation, flowering and subsequently fruit maturity may be delayed. In studies conducted in Australia and Florida (McDermott *et al.* 1987) the period of delay is not exceptionally great, usually between 5 - 12 days. George *et al.* (1992) were able to show that paclobutrazol can control compensatory regrowth normally associated with severely post-harvest topped trees. Limited observational studies indicate that if post harvest topping is carried out by early summer then trees will have sufficient time to regenerate new fruiting wood without delay in flowering or fruiting in the following season.

Post harvest-topping techniques would be suitable to use with very early maturing varieties and for trees that are planted at higher densities than normal. It would also be an ideal technique to use in regions with a distinct wet season. In these regions leaf surface area on the tree may be severely reduced as a consequence of strong wind and leaf diseases. Post-harvest topping will result in regeneration of new, healthy leaf that will be more resistant to leaf drop.

Fertilising mature trees

Stonefruit remove significant quantities of the major elements N and K and the minor elements B and Zn. Whilst it is desirable to base fertiliser rates on the amounts of nutrients removed by the crop (Figure 2) many other factors must be taken into account to determine the correct quantities of nutrients to apply.

The amount of fertiliser applied to an orchard needs to be based on these factors:

- the amount of nutrients removed from the orchard in fruit, leaves and prunings;

- the amount of nutrients leached from the soil or washed from the soil surface;
- the amount of nutrient unavailable in the soil due to fixation;
- recent leaf and soil analysis data;
- visual leaf nutrient symptoms and tree growth.

Consequently the rates of nutrients to apply for different soil types, locations/regions may vary by a factor of up to 2–3 fold; thus both leaf and soil nutrient analyses are the most essential tools for adjusting fertiliser rates. Do a leaf and soil analysis at the end of year 2 and then a leaf test every year at about two weeks after harvest.

To work out what fertilisers need to be applied, simply compare your leaf and soil analysis results with published standards for stonefruit. Only apply nutrients where your leaf and soil levels need to be adjusted to bring them into line with the standards. In fertile soils, nitrogen is likely to be the only nutrient that needs to be added on an annual basis. In less fertile sandy soils, phosphorus, potassium, calcium and magnesium, as well as nitrogen, may need regular adjustment.

Having worked out which nutrients need adjustment, rates of fertiliser use are best based on the philosophy of replacing those nutrients removed in the fruit, leaves and prunings. This has been calculated for crops of varying yield and adjusted to take account of pruning and nutrient losses from soil leaching. As an example, a broad program of fertiliser use for a crop yielding 25 tonnes per hectare is shown in Table 2. The figures assume full nutrient replacement is required. In reality, nitrogen may be the only nutrient required.

Nutrient leaching losses and fixation

Heavy rainfall, excessive irrigation and runoff can leach valuable nutrients from the soil. Normally, leaching is greatest in soils that are light in texture with little clay and low in organic matter (Table 1). Because soil type and weather conditions vary so much, it is difficult to assess with any confidence how much nutrient loss is suffered due to leaching. The following losses can occur:

- 30-70% of applied nitrogen and potassium lost by leaching;
- 50-80% of the phosphorus applied could become unavailable to plants by fixing or washed away by runoff.

The figure for phosphorus may be low and will be dependent on soil type. In a podzolic soil 75% of applied phosphorus may become unavailable to plants, while in krasnozems, 95% could become unavailable. Stonefruit phosphorus requirements are low and the probability of a deficiency occurring is remote. Incorporating phosphorus into the soil profile before planting assures its availability over a long period. Nutrients supplied by fertiliser can be lost to the atmosphere. For example, if urea, or fowl manure based fertilisers are not incorporated into the soil by either cultivation or water then significant ammonia loss (up to 40%) can occur.

Table 1. Estimated leaching losses (%) for different soil types and rainfall

Soil type	Low rainfall (<1000 mm)	Medium rainfall (1000-1600 mm)	High rainfall (>1600 mm)
Sand	30	35	45
sandy loam	25	30	40
Loam	20	25	30
clay loam	10	15	20

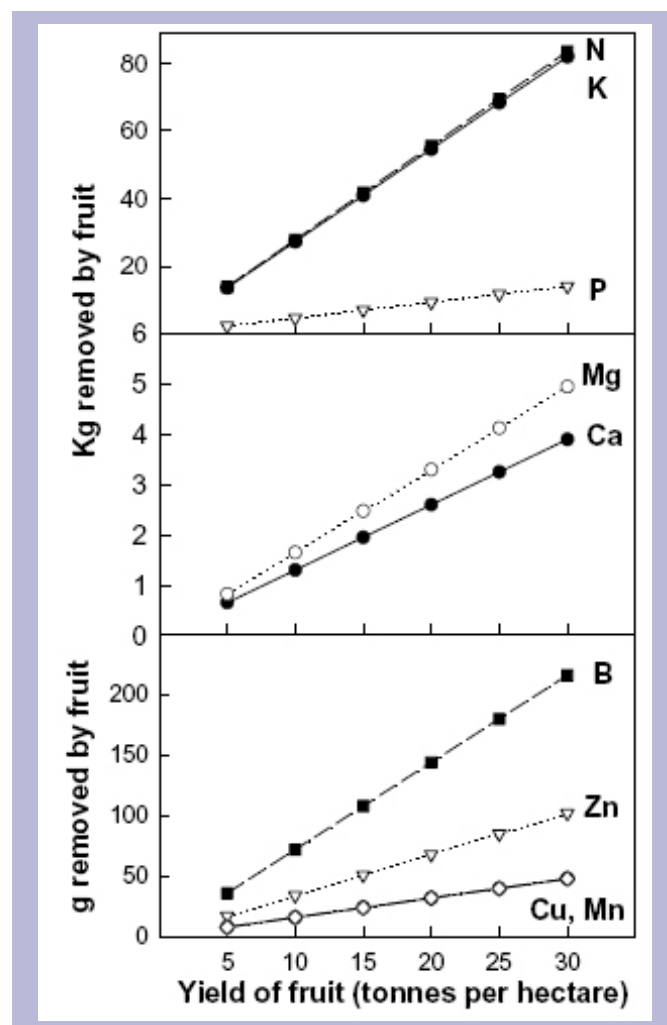


Figure 2. Nutrient removal by low-chill stonefruit fruit

Timing

The optimum time to apply fertiliser for low-chill cultivars appears to be in late winter/early spring at the time of budbreak (Goldspink, 2001, pers comm.). Up to 60% of the trees fertiliser requirement should be applied at this time. A small amount of nitrogen needs to be applied post-harvest and again in early autumn to maintain leaf health and to reduce the build up of leaf diseases in this period. However, excessive applications

of nitrogen after harvest should be avoided otherwise trees will produce several vegetative flushes into the late autumn which will delay floral bud initiation and flowering.

Fertilizer Placement

Mature tree roots extend into the middle of the row so the whole of the orchard should receive some fertiliser. Set up the fertiliser spreader to place most of the fertiliser under the tree canopy

Table 2. New fertiliser rates and timing for Australia

Nutrient	Fertiliser rate (kg/hectare)*			Total rate per year
	Budbreak (late winter)	Post-harvest (early summer)	Early autumn	
Nitrogen	66	22	22	110
Phosphorus	9	3	3	15
Potassium	66	22	22	110
Calcium	150			150
Magnesium	42	14	14	70

*These fertiliser rates are an average rate and will require further adjusting for different soil types and leaching rates. Adjustments should be based on leaf and soil analyses.

Would you like to be involved in climate research?



Researchers at the Australian Museum wish to place compact 'climate stations' on large rural properties throughout NSW. We are therefore seeking expressions of interest from property owners who are willing to have these stations located on their property.

The climate stations are only 9.5cms in diameter and stand 14cm high. They are to be installed and maintained AT NO COST to the property owner. However, we do ask that the stations be left in an area that will remain undisturbed by livestock or people during the monitoring period (1 year from approx. December 08), and that research staff be allowed to access the properties for installation, tri-monthly maintenance and removal of the station (5 visits in total). Properties containing areas of natural or semi-natural vegetation are preferred, but some pastoral environments would also be useful.

Why not use the Bureau of Meteorology (BoM) data that is already available?

BoM stations measure air temperatures from 1.2m above ground and are only located in areas free from vegetation and with relatively flat topography. We are interested in near-surface temperatures in vegetated areas, as these are potentially more important for seedling germination and ground dwelling animals. In addition, we wish to determine the effect of topography, and to record temperatures in remote locations where there are no nearby BoM station.

If you think you would like to participate, or need more information, please contact Natalie Sullivan at natalie.sullivan@austmus.gov.au

Citrus Australia Ltd sets course of action

Source: Citrus Australia Ltd, media release, 10 November 2008.

The seven new directors of the recently formed national peak body Citrus Australia Ltd (Citrus Australia) have rolled up their sleeves to set a new approach to grower representation.

Two meetings within the last fortnight have included:

- The election of Kevin Cock as Chair and Kelly Jones as Deputy Chair.
- Confirmation of Judith Damiani as CEO.
- A handover session with the outgoing Australian Citrus Growers Inc directors.
- Formal recognition by Plant Health Australia as a new member and signatory to the Emergency Plant Pest Response Deed, ensuring growers are protected against incursions.
- Discussion with Horticulture Australia Ltd (HAL) on partnership roles and responsibilities and the national citrus research and development and marketing levy programs.

Appointment of a small team to work with HAL in developing a citrus industry development plan which will assist in focusing industry communication and extension resources to meet the current needs of growers.

Citrus Australia Chair Kevin Cock praised the enthusiasm of his fellow directors.

“We have unanimously agreed to move straight into stakeholder engagement to assist us in confirming the industry’s priorities and the most effective structure to push forward as quickly as possible (including the Board’s own advisory committees)”

This will commence with a meeting of growers in Queensland on 19 November.

“Of course the Citrus Australia Board recognises the challenging issues facing growers today with continued low water allocations in the southern Murray Darling Basin; increasing input costs; marketing/market access and regional differences but it also embraces the

opportunities the Australian citrus industry can capture with a growing Australian and global consumer base, new varieties and a strong export focus” Mr Cock said.

Citrus Australia is keen to improve on what is working well in the industry through unity, innovation and sustainable practices.

Citrus growers across Australia are now able to apply to join the new organisation directly by completing the Membership Application Form contained in Annexure B of the Information Memorandum that they have received in the mail, or by downloading it from the Citrus Australia website, www.citrusaustralia.com.au

For more information contact: Kevin Cock – Chair: 0418 502 293.

Netting trials for citrus

Source: SA Citrus Board newsletter, 21 November 2008

Trials conducted by the WA Department of Agriculture and Food at the Gascoyne Research Station suggest netting citrus can improve fruit quality and quantity. The research led by Dr Amanda Annells commenced in 2005 when netting was constructed at the research station over navels planted in 2006. Harvest results indicate that Newhall, Navelina and Cara Cara have all benefited from the shelter.

Trees grown under shelter had significantly larger trunk circumferences and produce more fruit. The yield and amount of marketable fruit was 5 times higher, with young trees reaching their first crop twice as fast. While the research is in its early days the results are certainly encouraging and worth closer scrutiny.

Draft national fruit fly strategy released

Source: SA Citrus Board newsletter, 5th December 2008

The draft National Fruit Fly Strategy has now been released by the Federal Minister for Agriculture, Fisheries and Forestry, Hon Tony Burke.

The draft National Fruit Fly Strategy is the culmination of a two year process, with Plant Health Australia (PHA)

being instrumental in facilitating its development with all relevant stakeholders, government and industry. An Implementation Committee (IC) has been formed to develop an action plan for the implementation of the draft Strategy.

The IC includes industry and government members.

At the last Federal election the Rudd Government agreed to commit \$5.4 million to develop and implement a national strategy for fruit fly. The initial \$1 million will fund the collection and analysis of fruit fly information held by states and territories, industry and research organizations to develop a management tool kit, a national diagnostic standard and pest data sheets.

Copies of the draft National Fruit Fly Strategy is available on the PHA website at www.planthealthaustralia.com.au/fruitfly. The first face to face meeting of the IC was on 3 December 2008.

Traveller's guide to Australian interstate quarantine

Source: SA Citrus Board newsletter, 5th December 2008

A Traveller's Guide to Australian Interstate Quarantine is now available for interstate (non-commercial) travellers. The guide outlines the restrictions applied by each state and territory to the movement of items (such as plants, animal products or agricultural equipment) that pose a risk to the health status of local industries and their ability to maintain access to local and overseas markets.

The guide was put together with input from Plant Health Australia (PHA) and each of the state and territory governments. PHA has contributed funding for the establishment of the new Quarantine Domestic website www.quarantinedomestic.gov.au. For further information or a copy of the brochure, visit the website or contact your state quarantine authorities through Quarantine Domestic on Freecall 1800 084 881.

The processed food and beverage sector is the State's largest manufacturing industry.

**Source: NSW Department of State and Regional development,
www.business.nsw.gov.au**



Department of State and Regional Development

New South Wales' food and beverage processing industries generated a turnover of some \$25 billion in 2006-07 (more than 20 per cent of NSW's total manufacturing output) and employed more than 20 per cent of the State's manufacturing workforce.

Built on a strong and diversified agricultural production base valued at \$7.7 billion in 2006-07 (see our Agriculture and Fisheries profile), New South Wales' food and beverage manufacturing industries account for around 30 per cent of Australia's total processed food production and the Australian industry's contribution to the national economy.

The State's food industry also generates exports exceeding \$3.5 billion each year, with meat products and wine accounting for around half this total. The major markets for NSW's processed food exports are Japan, USA, New Zealand, Korea and the UK.

NSW food and beverage industries employed nearly 150,000 people in February 2008 - 90,000 in farming/fishing and some 58,000 in processing/manufacturing. The industry also provides flow-on employment in NSW for another 210,000 people in food wholesaling and retailing businesses.

NSW's processed food industry is highly diversified. The largest sectors, based on turnover, are:

- meat and poultry products
- flour, cereal and bakery products
- beverages, particularly soft drinks and wine
- snack foods and prepared meals
- dairy products
- horticultural products
- confectionery

NSW's food industry enjoys a number of key competitive advantages, including:

- an amazing diversity of growing conditions
- a 'clean and green' natural environment
- a strong R&D and education/training infrastructure covering food production, processing, packaging and handling
- reliable, competitively-priced production inputs
- first class transport links to major domestic and overseas markets
- and a highly skilled and committed workforce.

The Department of State and Regional Development undertakes a range of activities to support the continued development and growth of the State's food industry. It helps companies address the challenges of an increasingly competitive domestic and international marketplace and grow their businesses, in areas such as enterprise improvement, export development, product and process innovation, supply chain management, environmental sustainability and regulatory enhancement.

A regular e-newsletter, Food Bytes, promotes initiatives, events and resources that are available to assist the State's food and beverage industry.

Copies of the Food Bytes newsletter & the NSW Food Export Directory 2008-09 can be downloaded at this site <http://www.business.nsw.gov.au/food>

Report from the Australia and New Zealand Food Regulation Ministerial Council

24 October 2008

Food ministers consider food labelling review

The twelfth meeting of the Australia and New Zealand Food Regulation Ministerial Council was held in Adelaide in October. The Ministerial Council comprises Ministers responsible for food issues in Australia and New Zealand and considered a number of strategic policy and food standards issues including:

Comprehensive review of food labelling law and policy

The meeting agreed in principle to commission an independent, comprehensive review of food labelling law and policy. The review will be undertaken by an independent expert panel and chaired by an independent public policy expert.

Front of pack labelling

The Ministerial Council received a report from the Food Regulation Standing Committee (FRSC) on front of pack labelling of food that provides consumers with easily accessible information on the health status of the contents. The Ministerial Council had asked for an investigation on whether a front-of-pack (FOP) labelling scheme would be an effective health strategy to guide consumer choice towards healthier food options. The meeting agreed that FRSC provide a draft ministerial policy guideline to ministers at their next meeting in May 2009.

National food incident response protocol

The Ministerial Council endorsed the revised National Food Incident Response Protocol (the Protocol). The Protocol was updated to ensure an effective system for the consistent management of national food incidents. Under the revised protocol FSANZ is the Central Notification Point and agency responsible for coordinating national food incident responses.

Trans fatty acids in the Australian and New Zealand food supply

The Ministerial Council agreed that the trans fatty acids survey, currently coordinated by Food Standards Australia New Zealand (FSANZ), should include dietary intake assessment based on the latest results on the National Children's Nutrition and Physical Activity Survey. FRSC is to report back on the survey results and provide a progress report on the voluntary initiatives by industry to reduce trans-fat intake to the Ministerial Council at its next meeting.

Food colouring

The Ministerial Council noted FSANZ's efforts in monitoring and researching issues in relation to food colours and requested to be kept informed.

Premium perceptions vital for Australian food: industry report

Source: Australian Food News , <http://www.ausfoodnews.com.au>

Daniel Palmer, 10 November 2008

Australian horticulture must position itself as a supplier of high-quality produce that attract premium prices to be competitive both domestically and abroad, according to a recently-released industry report.

The Global Focus report Australian Horticulture - fresh fruit and vegetables, by specialist agribusiness lender Rabobank, notes, "Australian horticulture cannot build its competitive advantage on cost leadership due to increased competition from low-cost producers who don't face production challenges that local producers do such as water scarcity and labour shortages".

"Therefore, Australian fruit and vegetable suppliers must position their produce on non-price attributes such as quality, food safety, and environmental and social responsibility," Vera Zelenay, report author and Rabobank analyst, suggests.

According to the report, global and domestic markets offer emerging opportunities for fresh fruit and vegetables suppliers. As consumer preferences shift towards the need for freshness, quality and convenience, consumers are demonstrating their willingness to pay a premium for these attributes. "This is particularly evident in mature markets where value growth is expected for the horticulture industry as consumers demand more value-added products - food appealing to health and well-being, convenience and practicality, and experience and taste," Ms Zelenay advised. "And in emerging markets, economic and population growth, are expected to drive market volume growth."

Another opportunity of expansion for Australian horticulture is the potential for an increase in consumption over and above population growth. "Australia's fruit and vegetable per capita consumption of 199 kilograms per year is relatively low when compared to other developed countries such as Italy (298 kilograms per year) and New Zealand (250 kilograms per year)," the report notes.

Production challenges for Australian fruit and vegetables

A key challenge for the production of Australian fruit and vegetables is its high dependency on irrigated water.

"Water scarcity, particularly in the Murray Darling Basin, will pressure local producers to increase their efficiency in the delivery and use of irrigated water, and force them to develop water management strategies and increase the accuracy of their budgeting processes," the report adds.

Climate change also presents a double challenge for the production of fruit and vegetables: producers - in Australia and around the globe - will need to adapt to a changing environment and cope with the implementation of an Emissions Trading Scheme (ETS).

"Adaptation and mitigation responses to these challenges will be vital. They include changing the product mix to those activities more suited to the new conditions, or moving the enterprise to a new region where climate and resources are more favourable."

Australian competitiveness in world horticulture trade

According to the Rabobank report, increased competition from imports during the past five years has meant that Australian suppliers have been progressively losing market share. Together with other challenges fruit and vegetables producers face, such as water scarcity and climate change, this may drive major restructuring within the horticulture industry. "This could potentially give rise to a certain degree of specialisation in the industry's most competitive products," it states. Macro-economic factors such as the AUD exchange rate have also decreased Australia's competitiveness in global horticulture trade over the past three to five years.

Outlook

It is anticipated that increasing populations and incomes, especially in developing economies, and a growing demand for year-round supply of fresh produce to developed northern hemisphere markets, will sustain growth in world horticultural trade until 2020.

"Asia is currently experiencing rapid population and income growth, making it a very attractive export market for Australian fresh produce," Ms Zelenay said. "At the same time it is believed the Australian domestic market will expand by around three million people, and both international and domestic per capita consumption of fresh fruit and vegetables will increase as consumer preferences shift towards horticultural products and away from alternative foods, driven by wellbeing trends."

"Understanding these trends and supplying accordingly is an imperative for Australian fruit and vegetables suppliers who aim to succeed in such a competitive environment," the report concluded.

The special Conservation Scheme for primary producers

Extracted from the NSW Rural Assistance Authority website www.raa.nsw.gov.au

The Special Conservation Scheme is an incentive-based initiative to assist farmers within New South Wales to protect the States biological and physical resource base by completing certain conservation works on their property which they may not have otherwise undertaken.

Purpose:

Funding by way of a loan is available to carry out those works that will have a significant beneficial impact on the land, the local community and the environment AND are not purely productivity based.

(Examples of acceptable works)

- Exclusion netting to prevent flying fox damage to existing orchards with a demonstrated flying fox problem
- Soil Conservation
- Woody Weed control
- Control of noxious weeds – (As defined in Schedule 3 of The Noxious Weed Act)
- Up-grading/improving existing irrigation systems

Amount:

A loan of up to 90% of the net, GST exclusive, cost of the works to a maximum of \$150,000. The net cost is determined by deducting the amount of any other Government grants relating to the proposed works.

Interest:

The rate will be that applying at the date on which the loan is approved and is fixed for the term of the loan.

Term:

Up to 15 years dependent upon the amount borrowed and applicant's ability to repay. Works must be completed within 12 months from date of loan approval

Costs:

There are no establishment or account keeping fees,

however, costs for registering security documents and Government Stamp Duty will be borne by the applicant.

Applications must be in the name of the registered proprietor of the land on which the work is to be undertaken, and must be lodged before the works are commenced.

Am I eligible for assistance?

To be eligible you must:

- Be the registered proprietor of the property where the work is to be carried out AND be in working occupation of the farm.
- Show the farm enterprise under normal seasonal conditions provides the MAJORITY of your total GROSS income.
- Not have net assets exceeding \$5,000,000.
- Demonstrate that the works have a significant beneficial impact on the land, the community and the environment AND are not purely productivity based.
- Show that the works will complement or improve the natural resource base of the farming enterprise.
- Demonstrate that your farm enterprise has long-term viability and has the capacity to repay the loan sought.
- Provide satisfactory security to support the loan sought.
- Demonstrate, for hay, grain and silage storage facilities only, that under normal circumstances the majority of GROSS income is derived from livestock production and not from cropping.
- For noxious weed control, provide a copy of the Local Control Authority's Management Plan for plants to be controlled or eradicated

The above information is a guide for prospective applicants. Full details can be obtained by contacting the Authority

How do I apply?

Application forms are available from the NSW Rural Assistance Authority by telephoning:

Toll free 1800 678 593 or (02) 6391 3000, or visit our web site: www.raa.nsw.gov.au

What's new in publications

NEW Primefact – Aquatic weed management in waterways and dams

View at: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/256403/Aquatic-weed-management-in-waterways-and-dams.pdf

Bureau of rural science brochures

The Bureau of Rural Sciences has recently produced a pair of brochures to promote best practice processing of green waste, to minimise weed spread. They can be viewed and downloaded via the BRS website at the following links.

1. Managing green waste to reduce weed spread - for local councils

View at: <http://affashop.gov.au/product.asp?prodid=14069>

2. Managing green waste to reduce weed spread - for home gardener

View at: <http://affashop.gov.au/product.asp?prodid=14070>

What's new on the web

Pasture species database

Access the Pasture Species Database and the Cultivar Database from the website of The Grassland Society of Southern Australia Inc.

From here you can search the pasture species database by specifying a group, minimum rainfall, tolerance of soil acidity and/or lifecycle or you can search for cultivars of nine common pasture species.

<http://www.grasslands.org.au/pasturespecies.htm>

The Ultimate Citrus page

A USA site for purchasing books on citrus, information and links to other citrus websites. Go to <http://www.ultimatecitrus.com/index.html>

Australian Food News

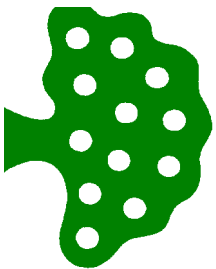
For articles on food from Australia and around the world, new products, upcoming events. Go to <http://www.ausfoodnews.com.au/>

New Australian horticultural workers website

FruitPicking.org is a new Australian online start-up venture which has been created specifically for bringing Australian horticultural growers together with job seeking travelers. The website is dedicated to establishing a long term solution to getting enthusiastic traveling worker onto farms to help prevent the wastage of unharvested produce.

Growers who subscribe to the new website simply post their own job vacancies onto the website where prospective workers can then contact growers directly. A free 2 month trial is offered. For more details about the website visit www.fruitpicking.org or email info@fruitpicking.org or phone Richard Morgan on (02) 9484 0889.

Print Post Approved
PP255003/00759



COASTAL FRUITGROWERS' NEWSLETTER

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

NSW DPI – Who to contact

Mobile 0411 139 567

Mobile 0412 436 871

Mobile 0412 425 730

Mobile 0411 109 159

Mobile 0412 424 628

(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.

PRINT
POST

PP 255003/00759

POSTAGE
PAID
AUSTRALIA

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