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Fruit Drops

Andrew wants your bugs!

NSW DPI has been awarded funding to develop a DNA-based diagnostic system for agricultural pest insects and mites using DNA Bar-coding technology. This method will allow the rapid and accurate identification of almost any insect pest, regardless of developmental stage (egg, larva, pupa or adult) or geographic origin.

The resulting data promises to have a profound impact on current practices in quarantine, integrated pest management, ecology and taxonomy. NSW DPI requests your assistance with obtaining the necessary insect specimens for initial characterisation.

Pinned insect specimens may be useful, depending on their age (less than 5 years) and storage conditions, but we also need specimens preserved in 95-100% ethanol. We would of course acknowledge all contributions.

For collection vials and ethanol or detailed information on collection methods, contact:

Andrew Mitchell
Agricultural Scientific Collections Unit, OAI
NSW Department of Primary Industries
Forest Rd
Orange NSW 2800
AUSTRALIA

Tel: 6391 3848
Fax: 6391 3899



New look for labels- your comments needed

The Australian Pesticides and Veterinary Medicines Authority (APVMA), is currently looking at ways to improve the layout and wording on Agricultural chemical labels.

The review panel would like the input of farm chemical users to ensure that any format changes make labels easier to read and understand. The web link has examples of current chemical labels and an example of what the new ones may look like.

Comments are required before the 15th of April 2005.

http://www.apvma.gov.au/registration/labels_review.shtml

NZ Apple Imports Senate Report out

The senate report from the inquiry into the NZ Apple IRA process is now available at

http://www.aph.gov.au/senate/committee/irat_ctte/apples04/report/report.pdf

The report is quite long (70 pages), but is worth a read if you are interested in the NZ apple import issue.

Help with harvest labour

The National Harvest Labour Information Service helps growers and jobseekers find each other.

For many vegetable and fruit growers, sourcing reliable labour at peak harvest times can be one of the most difficult tasks. Help is at hand with the introduction of the National Harvest Labour Information Service (NHLIS). The service has been introduced to alleviate harvest labour problems by mobilising people from areas that have finished harvest to regions where they are desperate to complete harvest.

The NHLIS is supported by three key links:

- The National Telephone Service that has a free call number 1800 062 332. This service runs from 8am to 8pm (EST) weekdays throughout the year.
- The Harvest Trail Website, www.jobsearch.gov.au/harvesttrail that provides comprehensive information about harvest opportunities in all states of Australia.
- The National Harvest Guide provides extensive information about harvest work opportunities and locations, working conditions, transport options and accommodation arrangements in key harvest regions across Australia.

Please call 1800 062 332 to order your free copy of the National Harvest Guide, register your labour requirements, or simply to find out further information about the National Harvest Labour Information Service.

NATIONAL HARVEST LABOUR
Information Service
"Making sure Growers and Jobseekers find each other!"

◀ Harvest Vacancies ◀ Accommodation ◀ Transport ◀ Local Information ◀ Other Requirements

MADEC
Jobs Australia
Looking People and Work

Harvest Trail
An Australian Government Initiative
www.jobsearch.gov.au/harvesttrail

www.jobsearch.gov.au/harvesttrail

Freecall 1800 062 332

The banner features a central illustration of various fresh produce including pumpkins, carrots, eggplants, and leafy greens. The background is a gradient of green and yellow.

Bio-control project to reduce borer damage in prune trees

Sue Marte
District Horticulturist
NSW DPI Young

Fruit-tree borer (*Maroga melanostigma* Wallengren) is a native pest of many trees, both native and ornamental, including *prunus* species. Although most pests which bore into fruit trees are called fruit tree borers, this pest should not be confused with other wood borers such as the longicorn beetle.

The damage caused by this pest has been noted since the mid 1800s. Typical damage can occur on all parts of the tree and is recognisable by the frass which the pest leaves behind as it feeds. The moth, which is found throughout Australia, is satiny white with a characteristic black dot in the middle of its forewings. In the Young district, it is active from late November to early February. The moth lays its eggs on the bark of the tree. As the larvae hatch they begin feeding in a manner which can ring bark the tree. By the third instar, they begin to bore into the tree. Their tunnels can be quite extensive and can cause severe structural damage. There are no chemicals currently registered for its control.



Maroga melanostigma

Growers wanting to control this pest clear away the frass and infiltrate the tunnel beneath with a thin wire, piercing the larva to kill it. Although this is a highly successful control, it is not very practical for a commercial operation.

When a pecan orchard in Moree, NSW was having problems controlling this same pest, they found a native species of *Trichogramma* which was partial to *Maroga* eggs.

Trichogramma are a minute parasitoid wasp, which lay its eggs inside pest eggs. When the *Trichogramma* eggs hatch, they feed on the developing larva, killing the host, and adult wasps then emerge from the egg and continue to parasitise other eggs.

The Australian prune industry has the potential to produce 5,000 tonnes of dried product a year. This represents about 2% of worldwide production and translates to about \$20 million per annum for the Australian economy. Conservative estimates put borer damage at reducing production by 5% in a tree. When up to 50% of trees in an orchard can be affected, this equates to a significant loss of production, and therefore income, for an orchardist.

The Australian Prune Industry Association (APIA) is supporting a three year project, funded by APIA, HAL and NSW DPI. The project is looking at biological control options for control of *M. melanostigma*.

In the first year (2004), studies were undertaken to increase knowledge about the pest and its lifecycle, and the trial design was implemented. Three orchards were chosen in the Young district, with four blocks of approximately 200 trees each surveyed. Any damage to a tree was noted within the four blocks.



Typical fruit-tree borer damage

During this past season (2nd year), biological control releases were made using *Trichogramma carverae*, at a recommended rate of 120,000 wasps/hectare. These were made in two each of the four blocks on the three orchards. Two releases were made, one week apart. The other two blocks had no releases and will act as controls.

During winter 2005, all trees again will be surveyed for damage. Changes to damage levels should indicate effectiveness of the *Trichogramma* releases. Also during this winter, entomopathogenic nematodes will be assessed as to their suitability as a bio-control during the larval stages of the

fruit-tree borer's lifecycle.

It is important for Australian produce to maintain its 'clean & green' image. Using biological controls instead of pesticides is only one of the benefits to be gained.



US apple and cherry expert visits NSW growing districts

John Golding
Postharvest Research
NSW DPI Gosford

Dr Gene Kupferman
Washington State Tree Fruit
Research & Extension Centre

Dr Gene Kupferman is an internationally recognised USA cherry and apple expert and he visited the Young, Orange and Batlow growing districts during the 2004/5 season. Gene's visit was funded by grower levies through Horticulture Australia to talk with growers. Gene is the tree fruit quality and post harvest technology specialist for Washington State. He has more than 25 years experience as an extension agent and researcher with Washington State University Tree Fruit Research and Extension Centre and is also a Fuji apple grower. He brought insight into the current trends of production, handling and marketing of US apples and cherries.



Dr Kupferman inspecting apple trees in Orange

Gene made many grower presentations around NSW, for example at the Australian National Field Days Horticultural Field Day, and spent time with growers and packers in the Orange and Young districts. He also presented a wide range of grower seminars at Young (cherries), Orange (cherries and apples) and Batlow (apples).



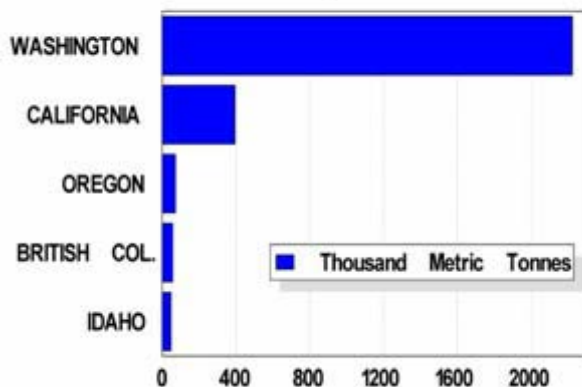
Gene's talks at the field day at Orange (left) and a technical night at Batlow (right) were well attended.

During his time in Australia, Gene discussed the future of the Washington cherry and apple industries in his many grower talks. This brief report will focus on Gene's discussions about the Washington State apple industry. The next issue of Fruitwise will focus on Washington State's enormous cherry industry.

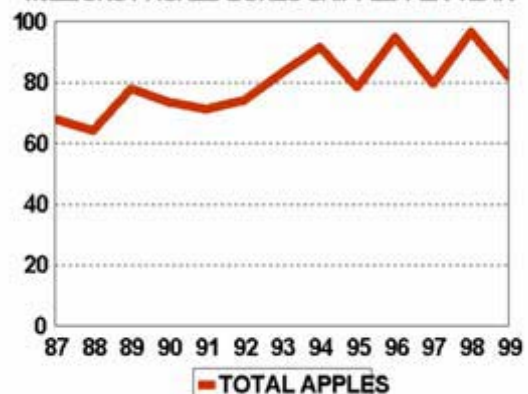
Facts about the Washington State Apple Industry

Washington State produces the largest amount of apples and cherries in the USA.
 Apples: 98.3 million boxes (20 kg) = Largest producing state in the USA
 (Pears: 12 million boxes = #1 in USA, Cherries: 72,000 tons = #1 in USA)

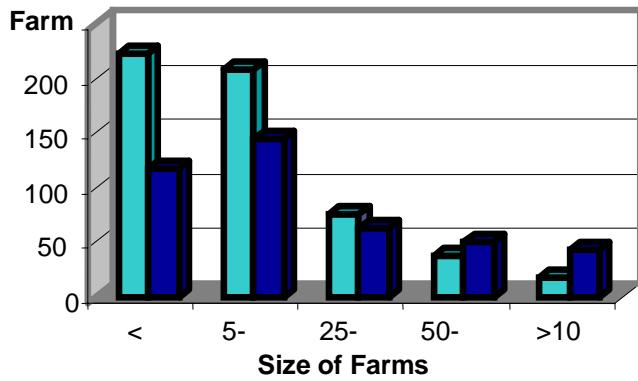
Apple Production By State or Province
 5 Year Average Season



WASHINGTON APPLE PRODUCTION
 MILLIONS PACKED BOXES SHIPPED PER YEAR



Wa. Grower Ct. House



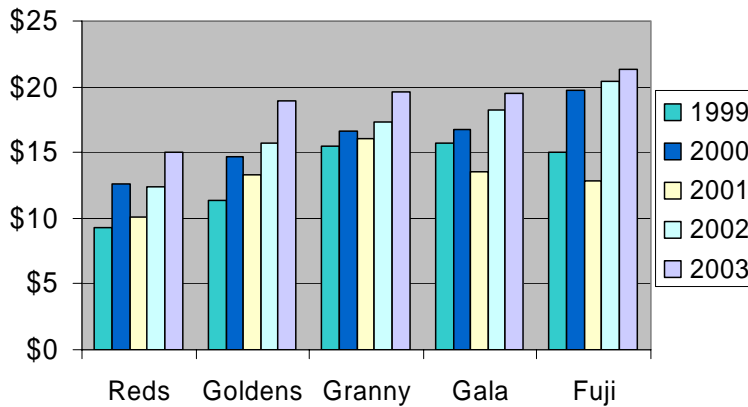
Washington State farm size has increased 1978 (green) vs. 1997 (blue)

Washington State apple orchards

Over nineteen years the size of orchards has shifted significantly. In 1978 the majority of farms were five acres or less. Nowadays Sixty-two percent of farms are under 10ha (25 acres), but account for only 10% of total acreage farmed. Ten percent have more than 41ha (100 acres) and control 62% of acreage (437 farms).

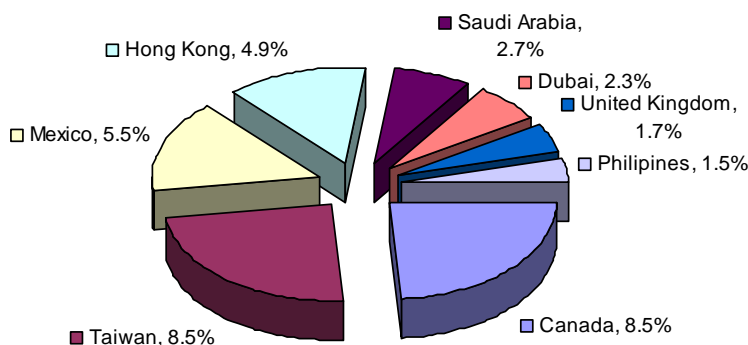
Australian farm sizes are following a similar trend. Total apple acreage in 1997 was 83,000ha (205,000 acres)

Sales Price (\$USD) of Washington State Apples per 20 kg box (1999-2003)



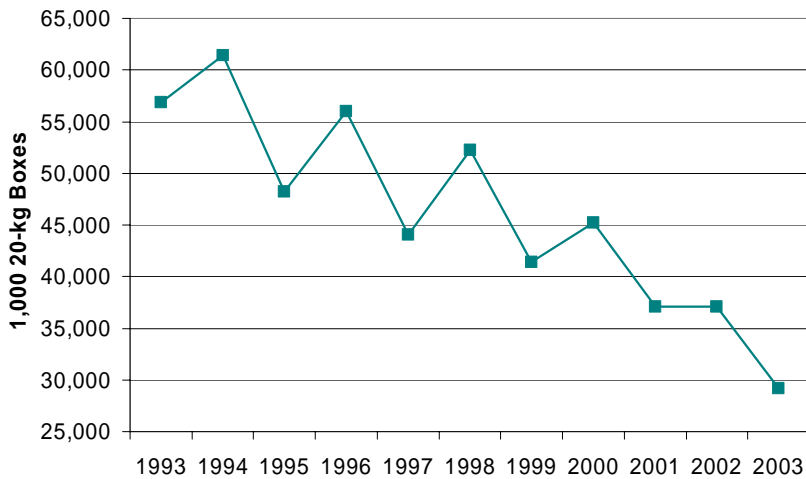
Sales prices of Red Delicious have increased since the mass removal of trees since the 90's; however, prices are still below other varieties. Fuji has become the most profitable variety in recent years. For all varieties, prices are variable depending on supply and demand.

Washington State Apple Export Destinations

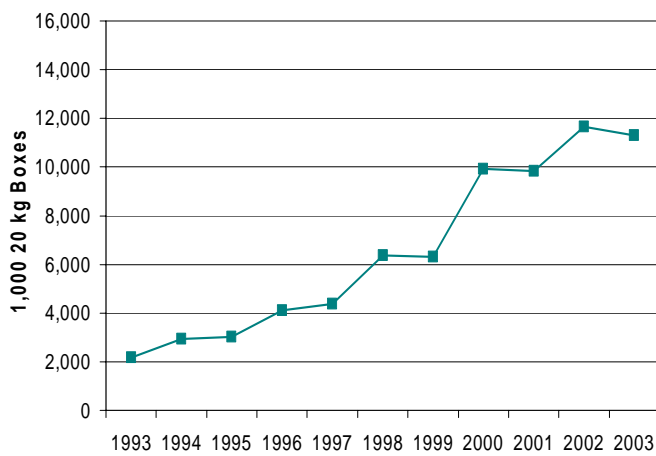


On the US domestic market, ten produce buyers account for 54% of grocery sales [Wal-Mart (11%), Kroger (10%), Albertsons (7%), Safeway (6%), Ahold (5%), Supervalu (5%), Fleming (3%), Winn Dixie (3%), Delhaize (3%), A & P (2%)]. Supermarket dominance is a big issue.

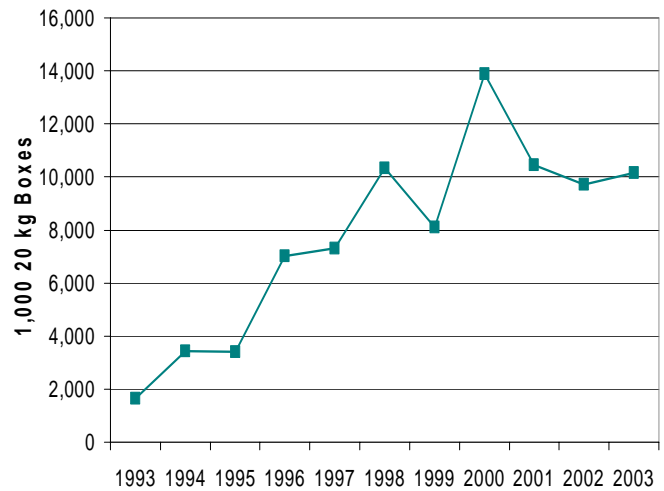
Decline in Red Delicious in Washington State



... and rise in Gala production



.... and rise in Fuji production



A lot of Red Delicious trees have been removed in the last decade, due to oversupply and poor prices. However, with Gala and Fuji now becoming global varieties, overproduction is likely to become a problem in the future as these varieties become "commodity varieties".

This project has been funded by the apple and pear and cherry levies, facilitated by Horticulture Australia Ltd (HAL) in partnership with APAL and the CGA. The Australian Government provides matched funding for all HAL's research and development activities (Horticulture Australia Limited Project CY04004).

Testing time for apples

Julie Dart
NSWDPI
District Horticulturist- Tumut

Now that the apple harvest is in full swing, it's a good time to revisit the principles of maturity testing with your staff. Harvesting fruit at the correct stage of maturity is important as the impacts on fruit quality at the point of sale are huge. Cold storage will not revive fruit past their prime!

Factors that may be used in the field to **roughly** estimate maturity include:

- Using forecast dates
- Background colour
- "taste test"

These methods can be used to give a rough estimate of when the fruit is likely to be ready, but must be backed up with more quantitative methods. Waiting to achieve the right colour is a dangerous game when growing varieties such as Pink Lady, as the fruit is likely to be over mature at harvest if conditions for colour development have not been ideal. Often the most physiologically mature fruits are the poorly coloured ones nearest to the trunk. (Test this theory at your place).

Quantitative methods for apple maturity include:

- starch-iodine test,
- firmness testing and
- sugar content (%total soluble solids).

The best indicator for maturity occurs when all three methods are used together on a sample of fruit.

The table below are the harvest maturity indices for CA and long term cold storage.

Variety	Firmness (kg)	% Total Soluble Solids (°brix)	Starch Index
Gala	>6.5	>12	1.0-2.5
Jonathan	>6.0	>11.5	2.0-3.0
Golden Delicious	>6.5	>12	2.0-3.0
Red Delicious	>6.5	>10	1.4-3.0
Pink Lady	>6.5	>12	1.5-3.0
Sundowner	>6.8	>12	1.5-3.0
Fuji	>6.1	>13	2.5-4.0
Granny Smith	>6.5	>12	1.5-3.0

Starch index uses the Washington AMP scale.

Source: Little, C.R and Holmes, R.J (2000) *Storage Technology for Apples and Pears*, Natural Resources & Environment, Victoria.

Tips for testing

Sampling:

- Sample at least 20 pieces of fruit per block- choose 5 trees and sample 4 fruits from each side- (N,S,E&W)
- Don't test damaged fruit
- Select fruit from both the inner and outer canopy
- Test apples as soon as possible after picking so that respiration does not affect results

Pressure Testing

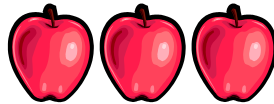
- Calibrate penetrometer before use
- Always use the 11mm tip for apples
- A potato peeler is good for removing skin and preparing a flat testing surface
- If using a hand held instrument, ensure that an even downward pressure is applied and that the penetrometer tip is only inserted to the line (not the guard)

Starch-Iodine test

- Iodine solution must be stored away from light, so cover all bottles in foil or black contact.
- Cut apple through the midline so the seeds in the core are cut through and form a star
- Make sure that the same half is used in all tests (e.g.: the top)
- Fruit can either be dipped in a shallow dish of the iodine solution, or it can be applied quicker using trigger pack spray bottle.
- Test fruit weekly until starch patterns start to move, and then at least twice weekly to ensure that maturity is detected in time.

To save time, the following protocol is used in many packing houses in Australia:

- 1) Gather sample
- 2) Cut a pressure testing point on the midline and test pressure
- 3) Test sugars from juice
- 4) Cut apples, line up and starch test



New stone fruit varieties confuse consumers.

Philip Wilk,
District Horticulturist
NSWDPI, Alstonville

The last seven years have seen a dramatic change in the varieties of low chill stone fruit being grown and marketed throughout Queensland and Northern NSW.

This has come about in response to customer concerns about the inconsistent quality of fruit being received through the central marketing system. These concerns were reflected in poor repeat sales of stone fruit in the September to November period.

Low Chill Australia, the organisation that represents growers of sub tropical peaches nectarines and plums, prioritised the breeding and evaluation of new varieties to return consumer confidence to the market. Unfortunately these developments have been a 'double edged sword' and have created a whole range of new issues that need to be urgently addressed by the whole supply chain.

Historically consumers were dissatisfied with traditional stone fruit that had soft or 'melting' flesh. If tree ripened before picking, these fruit would be soft and overripe by the time it was transported and placed on supermarket shelves. There was a large amount of wastage both on farm and at the retail end. Growers were then forced to pick fruit three to five days before the ripe stage. Much of this fruit was tasteless and colourless. In addition, in an effort to capture the high prices, it was sometimes picked too early.

Plant breeders, nurseries and private companies began importing and breeding stone fruit varieties with a non-melting flesh gene. This gene allows the fruit to be picked over a number

of days and remain firm for up to two weeks without softening. This fruit if picked at the tree ripe stage is still firm and can be transported to arrive in the retail market with no perceivable breakdown in the flesh. The fruit is juicy, highly coloured, aromatic and sweet. It is a vast improvement on the types of fruit marketed only a few years previously. Most of the new varieties of low chill nectarines, peaches and plums that are currently being assessed have this non-melting flesh characteristic.

Preliminary consumer taste panels have shown that some people prefer the traditional melting flesh varieties and an equal number prefer the new non-melting texture. Therefore both fruit flesh types will probably continue to be grown and available to consumers.

There are however some signs that non-melting fruit varieties, although a vast improvement on earlier varieties have their own unique set of problems for growers, retailers and consumers.

Over the last three seasons, grower observations have highlighted the difficulty of educating pickers as to the optimal time to pick non-melting varieties. Many growers may have both melting flesh and non-melting flesh stone fruit to be picked within the one block simultaneously.

Traditionally with melting flesh varieties, pickers are able to detect a piece of fruit that is ready to be harvested by colour, size and the 'slight give' in the flesh firmness.

However non-melting varieties are more difficult to pick at the correct stage both for growers and casual pickers.

Fruit can be highly coloured very early on in the development phase so this is not necessarily a good indicator of ripeness. Different varieties behave slightly differently and ripe skin colour varies with variety. After a few seasons, growers learn when fruit is ripe but it is extremely difficult to educate pickers on correct fruit maturity, especially if they work on a casual basis.

Picking based on fruit size is another standard method for picking time. However this method is only reliable for the first pick and as low chill stone fruit may have up to 4 subsequent picks it is difficult to rely solely on size alone as an indicator for harvest readiness.

The third traditional method of selecting ripe fruit is to squeeze the fruit with the thumb. There is usually a slight 'give' in the flesh but this does not occur with the new non-melting varieties. Fruit can remain firm and ready for picking for up to three weeks.

The fourth method is to use a refractometer to measure the total soluble solids in the fruit, but the amount of sugar can vary from one side of the fruit to the other depending if it was in sunlight or shade.

The unfortunate problem with non-melting flesh varieties is that once fruit begins to breakdown it often develops an 'off' flavour around the seed so timing of picking and transport is critical for consistent fruit quality.

From observations in 2003/2004, many non-melting flesh peaches develop a bleeding of red colour into the flesh when they begin to break down. This does not occur when the fruit is sizing up. This is not detectable by a picker who still feels the firmness of the fruit whilst it is still on the tree. They are reluctant to pick the fruit as they judge it as immature and not yet ready to harvest. The inability of knowing the optimum harvest time for non-melting varieties also creates similar problems in the supply chain right down to the retailer and consumer.

Presently in the major chain stores, the two flesh types, melting and non-melting are being displayed side by side or sometimes mixed. In many cases different varieties of nectarines and peaches may be mixed together in displays. One large supplier shows a preference for labelling stone fruit as commodities of yellow or white flesh nectarines or peaches.

Another major food retailer has shown a preference for stickers on individual fruit naming each variety and keeping separate lines.

Both methods of retail selling melting and non-melting flesh fruit will create new challenges for the industry. Traditional melting flesh varieties break down over time and store managers need to remove them from shelves or sell them quickly. The new non-melting flesh varieties will not show the same signs of breakdown. The fruit will be firm, colourful and fragrant but may have reached its optimum sugar levels and be beginning to break down. The only sign of breakdown is a wrinkling of the skin if the fruit is squeezed.

Consumers will have no way of knowing the difference and then reject these varieties as poor tasting fruit that will ultimately affect repeat sales.

Managing these new varieties and knowing when to remove them from customer sales will be a major adjustment to retail stores.

Throw in another variable of choice between three or four lines of peaches and nectarines both white flesh and yellow flesh, melting and non-melting. Where does this leave the consumer? Confused!

These issues need to be resolved immediately for stone fruit to have a good, consistent image in the eye of the consumer.



NSW DPI Extension Horticulturists

Commercial fruit growers who require horticultural production or pest and disease advice should contact their nearest horticulturist

Alstonville	Philip Wilk	6626 2450
Camden	Lawrence Ullio	4640 6408
Gosford	Sandra Hardy	4348 1916
Orange	Jeremy Bright	6391 3822
Richmond	Peter Malcolm	4588 2105
Tumut	Julie Dart	6947 4188
Young	Sue Marte	6382 1077

The information contained in this publication is based on knowledge and understanding at the time of writing (April 2005). 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 DPI or the user's independent advisor.

Inclusion of an advertisement or sponsor's symbol in this publication does not necessarily imply endorsement of the product or sponsor by NSW DPI.

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.