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# TALKING AVOCADOS



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storage of  
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Report on  
Phellinus noxius

Avocado R&D and  
marketing program  
overview



# Chairman's Perspective

## Avocados for Life 4th Australian and New Zealand Avocado Growers Conference – July 2009

This is a wonderful opportunity for Australian and New Zealand growers to hear the latest news relating to the essentials of the avocado industry. This is a growers' conference, so while science is a big part of it, the emphasis is on elements which strongly relate to all growers. These include all aspects of growing, marketing, exporting, climate and climate change and many more. The program is designed to be relevant to people involved in the whole of the industry, from the farm right through to the consumer.

I would like to acknowledge the great work done by Antony Allen and Alan Thorn (CEOs of Australia and New Zealand growers' associations) and their teams for the amazing work they have done to bring this conference to fruition. I also need to pay tribute to Tony Whiley, Ken Pegg and Antony Allen, who have worked hard to bring together the scientific elements of the conference. Every session of the conference has been carefully planned to provide up to the minute important information, which will help our industry and each individual player to thrive and prosper.

Cairns is a wonderful conference destination, the weather will be fantastic, and the company exceptional. I really look forward to welcoming you to this great event.

## Export

Two pieces of positive news on the export front:

1. A group of growers has joined forces to create a company to focus on the development of export of Australian avocados. This company the Avocado Export Company has appointed a General Manager, Mr Louis Grey, who will be speaking at our Conference in July. The company looks to export a percentage of the Australia crop to markets outside Australia. Avocados Australia was actively involved in the facilitation of formative workshops and meetings. The company is now up and running and I am sure you all join the Avocados Australia team in wishing it every success in its future endeavours.
2. At the time I write this article, a container of Australian avocados bound for Europe is travelling by ship through the Suez Canal. As you can imagine, much preparation was required to pull this together, with attention paid to fruit quality, funding, shipping requirements, overseas markets etc, not to mention complex European import regulations and food safety requirements. Congratulations to Sunfresh Marketing Cooperative for this venture, Mr Tom French will be speaking at our Conference in July and again, I am sure you all join the Avocados Australia team in wishing them well with future export plans.

Both of these ventures are exciting, particularly in times of substantially increasing avocado crops.

## Economic Challenges

Over the last 15 months, we have heard much about the global financial crisis, global warming and climate change, severe droughts, floods and fires, and the collapse of many seemingly strong and resilient commercial entities. Many of these have an effect on our industry but perhaps the closest to home is the demise of Timbercorp. This company has been in administration since 23 April 2009, and reportedly has debts of around \$900 million – according to its administrator Mark Korda, it is 'hopelessly insolvent'. Among its many investments, Timbercorp had considerable interests in a number of avocado orchards. It is estimated that the fruit from the Timbercorp orchards amounts to over 20% of Australian avocado production. I have had many telephone calls enquiring as to the possible impact of Timbercorp's collapse. At this point, I am happy to report that the impact has not been detrimental to our industry, and let me assure you that Avocado Australia continues to ascertain any possible flow-on effects, both now and into the future.

The Australian Government is currently running an enquiry into Agribusiness Managed Investment Schemes (MIS). I believe the timetable for the report is September this year. No doubt we will hear more about these tax driven schemes into the future.

## My recurring theme

In each newsletter, I continually refer to the need for smarter marketing, embracing change and exploiting opportunities as they appear on the horizon – in fact to go searching for such opportunities before they appear. The goal is to turn apparent adversity into advantage - it is important not to 'drop your bundle'. My message to all the marketing and export companies is to work together and exploit the advantage of higher volumes, broader expertise and wider market knowledge. The demand for fresh healthy products continues to grow throughout the world, and we are pretty naive if we don't take full advantage of this. While companies are competitors, this should not preclude them from exploring opportunities to trade collaboratively.

*Henry Kwaczynski*

Henry Kwaczynski  
Chairman, Avocados Australia



# Industry Matters

Written, edited and compiled by

**Antony Allen, CEO of Avocados Australia**

## Farm Institute says emissions trading scheme threatens small farmers

A rural think-tank claims small farms could become unviable if a carbon pollution reduction scheme is introduced. Mick Keogh, from the Australian Farm Institute, says the latest ABARE figures on the impact of the government's proposed emissions trading scheme "look pretty accurate". He says if farmers do have to pay higher power bills and transport costs, it's likely that small farmers on tighter margins will go out of business. "Larger scale farms are better able to accommodate these costs than smaller farms," he says. "So I suspect what it would drive is even more structural adjustment, particularly in the livestock sectors, where smaller farms would find it very difficult to accommodate these extra costs and still make a profit. "Therefore, we've got a whole range of social and other issues that would emerge out of that." Source: ABC

## Agriculture faces higher costs, even if excluded from emissions trading

Farmers have an extra year to prepare for an increase in costs associated with an emissions trading scheme, after the Federal Government delayed the scheme's start date by one year.

The Rural Industries Research and Development Corporation has released a report showing farm costs will increase by up to 8 per cent, even if agriculture is not included in the government's Carbon Pollution Reduction Scheme. The report finds that under a scheme, beef farmers' incomes could fall by as much as 60 per cent.

The National Farmers Federation is relieved the CPRS has been delayed, but says when it does come in it'll devastate the farm sector. The government will decide when and if agriculture will be included in the CPRS in 2013.

Truckies from the National Road Transport Operators Association have welcomed the delay to the scheme. "We certainly need this time to work through the details and fine tune the model that gets applied in the end, because it can't be forgotten that this is going

to be a permanent policy," spokesman Duncan Bremner says.

Controversial Western Australian Liberal backbencher Wilson Tuckey won't be supporting changes to the government's emissions trading scheme. The Member for O'Connor has consistently opposed the introduction of carbon trading scheme, and says it would be cheaper to invest in harnessing the power generated by the huge Kimberley tides. Mr Tuckey says delaying the start of an ETS won't make it any easier for Australian companies to do business in international markets, because they'll be competing against those who pay less for their energy. And he says introducing an ETS at any time will cost jobs. "For a start, the cheaper the energy you've got, the more chance you've got of employing people," he says. "As the cost of energy goes up, you employ fewer people." Source: ABC

## Tax bill blow for Great Southern, Timbercorp investors

Investors who lost millions in the corporate collapses of Timbercorp and Great Southern face the final indignity: a bill for millions of dollars from the Australian Taxation Office.

Investors may be exposed to Tax Office action because many of the collapsed schemes can no longer carry out their businesses in the way that attracted the favourable tax treatment in the first place. The potential tax blow would represent a triple whammy for investors in the failed managed investment schemes.

First, the 18,000 investors in Timbercorp who paid \$1 billion and the 43,000 investors in Great Southern who paid \$1.8 billion face the prospect of losing almost all their investments in the two managers, which collapsed in April and May.

Second, to enhance the tax-effective nature of the schemes, many investors borrowed heavily to invest in them, with revelations investors need to pay out \$615 million in loans for Great Southern alone.

Third, the Tax Office may rule that deductions made under the schemes are void because they are no longer operating within the product ruling they gained for favourable tax treatment.

## ANVAS ACCREDITED NURSERIES

ANVAS accredited trees can be purchased from the following nurseries:

<p><b>Anderson's Nursery</b> Graham &amp; Vivienne Anderson Duranbah Road <b>Duranbah NSW</b> Ph: 02 6677 7229</p>	<p><b>Avocado Coast Nursery</b> Greg Hopper Schulz Road, <b>Woombye Qld</b> Ph: 07 5442 2424</p>	<p><b>Birdwood Nursery</b> Peter and Sandra Young 71-83 Blackall Range Rd <b>Nambour Qld</b> Ph: 07 5442 1611</p>	<p><b>Turkinje Nursery</b> Peter &amp; Pam Lavers 100 Henry Hannam Drive <b>Walkamin Qld</b> Ph: 0419 781 723</p>
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## Timbercorp goes into receivership

Agribusiness Timbercorp has failed to re-finance its debt, and has appointed voluntary administrators. The administrators, KordaMentha, are currently going through Timbercorp's accounts. The company's employees were informed of the news this morning, but their job futures are unclear.

KordaMentha spokesman Michael Smith says crops could die, as Timbercorp's forestry and horticulture operations are suspended. "Well, we'll stop work on them. Those stoppages may sometimes be very brief, some of them may be longer," he says. "There isn't the cash flow to support the forestry and horticultural operations in the short term, until new arrangements are made with the finances of the company."

Administrators say Timbercorp's assets will be sold in the best interests of the company, so if it needs to pay debt quickly there could be a fire sale. Michael Smith says decisions will be made on a project by project basis. TimberCorp has significant water assets, and Mr Smith hasn't ruled out asking the Federal Government if it would like to buy them. Earlier this week the Federal Government wouldn't say if it was looking to buy Timbercorp's 100,000 megalitres of water licences. Source: ABC

## Timbercorp "hopelessly insolvent", as asset sales begin

Administrators for failed managed investment scheme company Timbercorp say it's time to start selling off assets. KordaMentha is applying to the Supreme Court in Melbourne to sell Timbercorp's olive and almond projects.

Spokesman Mike Smith has painted a bleak picture of Timbercorp's current options, and says it's time to move on. "The administrators have done the analysis and found that, first of all, Timbercorp, the responsible entity, is hopelessly insolvent," he says. "It has no money, no access to any more fund-raising, it has no employees, it has no infrastructure." Administrators hope to make a decision on what to do with Timbercorp's forestry assets in the next few weeks. Source: ABC

## Timbercorp investors consider options

Administrators Korda Mentha say a meeting later this month of Timbercorp's mango and some avocado investors will decide whether another company will move in as a 'responsible entity.'

Over the past month and a half, arrangements have allowed Simpson Farms - located between Bundaberg and Childers - to harvest avocados on the Timbercorp land that they manage. Meanwhile, discussions are also happening with Simpson Farms to see if they'll take over management and employ some of the workforce of a - predominantly mango - property at South Kolan near Bundaberg which was managed by Ooloo Farm Management on behalf of Timbercorp. Ooloo - which is part of One Harvest - walked away from the management of the property last week. Source: ABC

## Offers flow in to manage Timbercorp assets

Three organisations have put their names forward, offering to manage and control the best of Timbercorp's assets. The failed managed investment company went into voluntary administration last month, with debts of about \$900 million.

Forestry company Gunns has offered to manage Timbercorp's forestry projects, and Huntly Management and Primary Securities like the look of the mango, avocado and olive plantations.

Investor grower representative Chris Garnaut says such companies, as so-called "responsible entities", would re-organise the schemes and hopefully return profits for investors. "We believe that many of the schemes are viable and with a 'solvent' responsible entity, many of the schemes can be resurrected and run like they were originally proposed to do," he says. Source: ABC

The general manager of policy and research at CPA Australia, Paul Drum, said deductibility for investors in 2007-08 schemes would be questionable because the schemes may not have fulfilled the measures outlined in the product disclosure statements. The schemes only attract favourable tax treatment on the basis of what their prospectuses said the businesses would do. The ATO says in its guidance on product rulings that investors should "take appropriate action to ensure that the scheme is carried out in accordance with the product ruling". But in the case of a collapse, the business of growing trees necessarily departs from

the prospectuses.

At Timbercorp, investors in 2007-08 were able to claim a 100 per cent deduction on their investment of \$50 million into forestry schemes. But Timbercorp's administrator, KordaMentha, has called a halt to planting the forestry schemes from 2007-08 because it regards them as insolvent, raising questions about the performance of the schemes in line with the tax product ruling. A member of a Timbercorp investors' committee, Chris Garnaut, said: "It would be extraordinarily unfortunate if the Tax Office took a hard hand on this given the intentions of the investors."

Industry Matters continued

The deputy commissioner for aggressive tax planning, Stephanie Martin, said yesterday the Tax Office was not interested in a company's solvency, or clawing back deductions from failed businesses. But she said it would be reviewing whether failed schemes had differed materially from the prospectus used as the basis for a product ruling.

Source: Queensland Country Life

**New biosecurity snapshot a positive benchmark**

For the first time Australia has a single document that provides a concise overview of its plant health system. The National Plant Health Status Report has just been published by Plant Health Australia (PHA), the lead coordinating body for plant biosecurity in Australia.

Australia's Chief Plant Protection Officer, Lois Ransom, has commended the efforts of Plant Health Australia in publishing of the National Plant Health Status Report. "The National Plant Health Status Report promotes confidence in Australia's domestic food security and supports our access to overseas markets. The Report also gives the whole biosecurity sector a benchmark against which future improvements in the plant health system will be measured," Ms Ransom said.

The 180 page Report provides a wealth of information covering the plant pests of greatest concern to Australian industries, the organisations and processes involved in keeping Australia's

agricultural and forestry industries free from pests, and innovative plant health research projects currently being undertaken by Australian research organisations and universities. It is a consolidated snapshot of the system that protects Australian agricultural and forestry industries, worth more than \$20 billion a year, from exotic pests and diseases.

"This Report provides policy and decision makers across governments and industries an overview of the sophisticated biosecurity system responsible for protecting Australia's food supply and product markets. It is a useful reference manual for educators and those providing support and commercial services to the plant industry. It also demonstrates the robustness of Australia's plant health system and should build confidence in the quality of Australian plant products," said Greg Fraser, Executive Director and CEO of Plant Health Australia.

The National Plant Health Status Report identifies, among other things, details for the 2007/08 financial year including the more than 200 high priority plant pests that are exotic or of significant quarantine concern to Australia. It also highlights over two thousand biosecurity research and development projects currently underway or completed in Australia, and the in excess of 120 surveillance programs targeting plant pests of concern across the country.

Every Australian has a stake in Australia's plant health system. The system plays a crucial role in safeguarding agricultural industries



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**That's why our avocado growers are not just growers**

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Fax: (07) 5493 0911  
**Phone: (07) 5496 9922**

and sustaining regional economies, as well as helping to maintain production, productivity and access to export markets.

“The cooperation between all the stakeholders, both government and industry, that helped develop the National Plant Health Status Report has been admirable and I would like to thank everyone involved,” Mr Fraser said.

A copy of the National Plant Health Status Report is available on the PHA website at [www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au)  
Source: PHA

## Qantas to remove Filipino bananas from NZ flights

Qantas has announced it'll remove Philippine-grown bananas from its trans-Tasman flights. The decision comes after a North Queensland woman was served a Filipino banana on a flight from Auckland to Sydney. Aussie banana growers were outraged, as they've been battling quarantine authorities to stop foreign banana imports. Qantas says there were no quarantine issues with the overseas bananas and it's not viable to fly Australian fruit overseas for the return flight. However, the airline has asked its caterers to find alternative fruit options in NZ.

Coffs Harbour-based Nationals Federal Member for Cowper, Luke Hartsuyker, has welcomed the decision by Qantas. The airline buys over 1.8 million bananas each year from growers in Queensland and Western Australia for its domestic and international flights from Australia. Mr Hartsuyker has now invited Qantas chief executive Alan Joyce to sample bananas from the New South Wales north coast. He says he believes that bananas grown on the Coffs Coast are a superior product to those grown interstate.

Source: ABC

## Trend towards El Niño strengthens

The signs of a developing El Niño have strengthened during the past fortnight, according to the Bureau of Meteorology. It says the key indicators for this forecast are a drop in the Southern Oscillation Index (SOI) to around -10, further warming of the Pacific and a strong decrease in the strength of the Trade Winds. And the Bureau says many computer models remain firm in their predictions of an El Niño event in 2009.

This puts the odds of an El Niño at above 50 per cent, which is more than double the normal risk of an event. However, the Bureau says it is still possible, though increasingly less likely, that the recent trends may stall without El Niño thresholds being reached. El Niño events are usually (but not always) associated with below normal rainfall in the second half of the year across large parts of southern and inland eastern Australia. Another adverse sign for south eastern Australian rainfall is the recent trend to positive values in the Indian Ocean Dipole (IOD), as

measured by the Dipole Mode Index (DMI).  
Source: Queensland Country Life

## MEETING NOTICE

### Annual Avocado Levy Payers Meeting

**Avocado Industry Advisory Committee and the Avocados Australia Board advise that the 2009 Annual Avocado Levy Payers Meeting**

Will be held at:

Cairns Convention Centre, Cairns, QLD, 4870

On Wednesday **22 July 2009** commencing at **5:15pm**.

#### **Purpose of the meeting:**

For Levy payers to receive presentations from the Avocado Industry Advisory Committee and the Avocados Australia Board on the Industry Strategic Plan, the Annual Investment Plan and the IAC Annual Report (including reports from Horticulture Australia on the R&D and Marketing Programs).

# WARNING

Avocados Australia has for a number of years paid a large amount of money for the industry's right to use the **Heart Foundation "Heart Tick"** on avocados.

***If you are using a "Heart Tick" logo from anyone other than the label companies Label Press, Spicer Labels, Sinclair International and Warehouse Packaging and Design you are acting illegally.***

No other label printers are able to legally print the "Heart Tick" for use on avocados. Avocados Australia is undertaking a clean up of the "Heart Tick" printing. We will lose access to the "Heart Tick" logo if it is used illegally.

Avocados Australia, AUF and the Heart Foundation will enforce their Registered Trademark rights to the fullest extent.

If you have non-genuine labels do not use them. If you know of label companies offering to print non-genuine **"Heart Tick"** labels for you please let us know on **1300 303 971**, so we can all help keep this valuable tool.

***All growers could lose access to the "Heart Tick" logo if you don't act now.***



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## Industry Matters continued

### Award Modernisation

#### What is Award Modernisation?

As part of the Federal Government's new Fair Work Australia industrial relations framework, the Australian Industrial Relations Commission (AIRC) is currently undertaking the process of 'award modernisation'. The process involves reviewing and simplifying awards, with the key objective of reducing the number of awards in the system by creating awards with national coverage across industry and occupational lines. Around 5000 awards will be replaced by 150 new national awards, which will operate in tandem with the new National Employment Standards (NES) to create a new minimum set of conditions applicable to the majority of employers in Australia. At this stage, the process covers federal awards and employers only – ie those businesses which are 'constitutional corporations' – Pty Ltd or Ltd companies.

#### What is the process intended to achieve?

The Ministerial Request required that the new 'modern awards' should:

- minimise the number of awards applying to an individual business;
- be simple to understand and easy to apply and reduce the regulatory burden on business;
- be economically sustainable and promote flexible work practices.

Significantly, the Ministerial request also requires that *"the creation of modern awards is not intended to disadvantage employees or increase costs for employers"*

#### When will it take effect?

On 3 April 2009, the AIRC issued the new 'modern' Horticulture Industry Award (HIA) 2010 which will replace around 15 horticulture-related awards.

From 1 January 2010, modern awards will replace the existing awards, including all Notional Agreements Preserving State Awards (NAPSAs) and Pre-Reform Federal Awards.

#### What affect will it have on businesses?

The implementation of the modern Award will not simply be a process of swapping one award for the new HIA - businesses may still be covered by more than one award. While the impact of the award modernisation process will differ depending on the industry, some modern awards will offer terms and conditions that only have a marginal effect on wage costs, whereas others may result in significant cost increases. Unfortunately, this latter scenario is the case with the new Horticulture Industry Award 2010 for many.

#### What can a Modern Award contain?

The following standard provisions have been developed and will be included in all Modern Awards:

- 25 per cent casual loading;
- overtime payable for part-time employees working in excess of their regular, part-time hours;
- requirement to consult with employees and their union representative, if any, regarding major workplace change;
- provision to settle disputes about Award matters;
- default superannuation funds nominated, including a preservation of default funds to which the employer made contributions before 12 September 2008; and
- preserving accident pay of NAPSAs and Pre-Reform Awards to 31 December 2014.

#### Transitional Arrangements

The next step in the process is consideration of transitional issues relating to the implementation of the new Award. The AIRC is seeking proposals and submissions as to how transitional issues should be dealt with. Most modern awards will contain terms which involve changes to minimum terms and conditions. While the Act requires that modern awards must not include terms and conditions of employment which are determined by reference to State or Territory boundaries, a modern award **may** include such terms for an initial period of five years to cushion the impact of changes in wages and other conditions – in the case of employers, increases to labour costs. First submissions were due by 29<sup>th</sup> May, and Horticulture will be making a submission which will present justification for the longest possible transition period.

#### What do businesses need to do?

We strongly encourage employers to assess their existing arrangements and compare this with the terms of the new award to identify what impact the award will have on their business. To assist with this an award comparison table has been developed which will allow individual industries to compare their current award provisions with the new HIA conditions. Growers should contact Avocados Australia for further information. Costs are not the only consideration, the implementation of the new award may need a review of administrative arrangements.

For example:

- payroll and administration systems may need to be updated, due to the introduction of new job classifications (and wages);
- contracts of employment will need to be reviewed (to reflect new wage rates, penalty rates, allowances and the classification structure).

Workplace rosters and the arrangement of work should be

reviewed in light of the new provisions.

### Is there an alternative to Modern Awards?

Avocados Australia recommends that businesses consider making collective workplace agreements before 1 January 2010.

The following web sites will take you to the most relevant information, including the new award and submissions:

#### WEBSITES for Further Information:

Ministerial Request Award Modernisation:  
[www.airc.gov.au/awardmod/download/amrequest\\_consolidatedo81218.doc](http://www.airc.gov.au/awardmod/download/amrequest_consolidatedo81218.doc)

National Employment Standards – effective 1 January 2010:  
[www.airc.gov.au/awardmod/download/hes.pdf](http://www.airc.gov.au/awardmod/download/hes.pdf)

'Modern' Horticulture Industry Award:  
[www.airc.gov.au/awardmod/awards/horticulture.pdf](http://www.airc.gov.au/awardmod/awards/horticulture.pdf)

AIRC – Award Modernisation Stage 2 Industries  
– Agriculture – All Submissions  
[www.airc.gov.au/awardmod/fullbench/industries/awardmodindustry.cfm?award=agriculture](http://www.airc.gov.au/awardmod/fullbench/industries/awardmodindustry.cfm?award=agriculture)

### The 'modern' Horticulture Industry Award 2010 (HIA)

The new 'modern' Horticulture Industry Award was released on 3<sup>rd</sup> April this year by the AIRC.

The award modernization process was designed to deliver simple, flexible, and economically sustainable employment arrangements with the specific request from the Minister that the making of a modern award should not increase costs for employers nor disadvantage employees.

#### The Key Elements

The new Horticulture Industry Award (HIA) will come into force on 1 January 2010.

While the impact of the new HIA will differ depending on current award (eg current HIA or NAPSA) provisions, and under which existing state award an employer operates, the key elements of the new award are:

- A casual loading of 25%. This represents an increase to the casual rate of between 3% and 15% for most employers.
- Those employed in a new category of casual piecework arrangements will be subject to both the 25% casual loading and the piecework loading of 15% resulting in increases of up to 40%, bringing the minimum casual pieceworker rate to \$20.24 per hour.
- All Sunday work (even if part of the 38 'ordinary' hours) must be paid for at the rate of 200% with a minimum of 4 hours payment.
- The introduction of a span of hours for packing houses of

Monday to Friday 6.00am to 6.00pm requires that overtime rates of 150% and 200% will be payable outside of these hours, even if part of the 38 'ordinary' hours.

- A 5 level classification structure sets base wage rates between \$14.31 per hour and \$16.78 per hour dependent on qualifications, skill level and duties undertaken. Casual employees must be paid the 25% loading on top of the base rate.
- Leading Hands Allowance (over 4 levels of responsibility) provides from \$16.96 to \$35.40 per week. In some instances this represents an increase of up to \$20.70 per week per Leading Hand employee for employers.

#### Where to from here?

The next formal phase in the award modernisation process will be industries and other interested parties presenting submissions about the transition to the new Award. The AIRC has indicated that new Award provisions may be implemented over a period of up to 5 years.

#### What Growers Can do

We also strongly encourage employers to assess their existing arrangements, and compare this with the terms of the new Award, to identify what impact the Award will have on their business.

Avocados Australia also recommends that businesses consider making collective workplace agreements. A collective agreement can be tailored to the specific needs of the enterprise, can provide more flexibility, and can agree on conditions more suitable to the business and its employees. While an agreement may also reduce the impact of the proposed higher costs flowing on from the new Award, it is important to remember that wages or conditions must meet the minimum standards set by the NES.

Avocados Australia is working towards templates for business to utilise implementing collective agreements.

#### For further information contact:

**Antony Allen, CEO, Avocados Australia**  
[ceo@avocado.org.au](mailto:ceo@avocado.org.au) or on 07 3846 6566

Avocados Australia and HAC, working closely with the HAL Across Industry Project Reference Group (comprising horticulture industry representatives), has been actively involved in the award modernisation process on behalf of the industry. Industry has made written submissions to the AIRC, and IR specialists have appeared on our behalf at consultation sessions (hearings) of the AIRC, to ensure that the views (and particularly the concerns) of industry are well represented at each stage of the process.

# Around Australia

## North New South Wales Report

By Tom Silver, Avocados Australia Director for the North New South Wales Growing Area



Extreme winds and torrential rain was the memorable event this autumn in the North NSW and Mt Tamborine growing districts. Despite winds in excess of 120 km/h growers seem to have escaped catastrophic damage to orchards, suffering some fruit fall and a handful of trees blown over. Clean up however is extensive due to saturated soils, accumulated debris and wind breaks though serving their purpose now presenting tricky and sometimes dangerous obstacles. Also as a result of the continuing and extreme rainfall, Phytophthora is beginning to reappear meaning growers must be diligent and proactive in its control. NSW growers may be eligible for grants up to \$15,000 relating to clean up and immediate restoration costs. Details of grants are available at [www.raa.nsw.gov.au](http://www.raa.nsw.gov.au) or by phoning 1800 678 593.

I am hoping to see as many growers as possible in Cairns next month for the '4th Australian and New Zealand Avocado Growers Conference', this is a once in eight year opportunity to attend such a meet on home soil so don't miss out. All facets of the industry will be represented meaning a packed and interesting program that growers will undoubtedly benefit and learn from, not to mention visiting the Atherton Tablelands, probably Australia's most unique and beautiful horticultural areas. See you pool side!

The '09 harvest will soon be firmly upon us. I wish all growers good fortune and encourage them to heed the lessons of the past. Only supply quality, picked fruit above 23% dry matter and where ever possible market cooperatively, treating your fellow grower not as threat or competitor but as a partner with the same desired outcome. All the best!

## Central New South Wales Report

By Chris Nelson, Avocados Australia Director for the Central New South Wales Growing Area



On May 13th Central NSW growers were once again privileged to participate in another of Simon Newett's workshops. The workshop was hosted by Penny and Ernst Tideman and a big thankyou goes to them. Ken Pegg spoke at length covering much of the research on Phytophthora while Elizabeth Dann covered post-harvest diseases and Luke Smith brought us up to date on Phellinus noxius. After an excellent barbeque lunch, the Tidemans led us on a tour of their orchards providing everyone with an opportunity to debate the various issues confronting the local grower community. These workshops have been an enormous help to growers and I believe have been one of the best extension tools that the industry has used to date.

Wet weather continues to impact on our coastal region, bringing mixed fortunes to growers. The sand growers at Stuarts Point rely heavily on a small sandy aquifer which is now at its highest level since 1998. On the other hand winter soils remain far too wet in the mountain regions. Pepper spot is a much greater issue for the region this year as a result of the constant free water on the trees and fruit. To further add to our season of wild weather, a four day wind storm associated with the last rain event in late May caused significant fruit loss and some damage to fruit still hanging.

At the time of writing the domestic market to date has enjoyed the benefits of some careful supply/demand management from major players throughout the supply chain. From growers to supermarkets, they are to be congratulated, keep up the good work. On the export front you may have noticed the formation of a new export company. While I congratulate all organisations that have exported fruit in the past and those that continue to do so, I believe this new company can assist in lifting Australian exports to a new level. It is a great success for the industry and I would encourage all growers to consider export as an important market for the future. From what I have seen in the Asian markets on a study tour that Antony led earlier in the year, we have almost endless potential to cater for and grow these markets.

Finally I look forward to seeing as many growers as possible in Cairns for the joint conference and I wish everyone well for the rest of the season.

## Central Queensland Report

By Lachlan Donovan and John Walsh Avocados Australia Directors for Central Queensland Growing Area



At the time of writing this region is about halfway through the crop.

The returns from the market are better than last year and this can be put down to a couple of reasons. Shepards ran longer this year and as a result there was not as much early Hass on the market as last year. This contributed to a better offer to the consumer of mature fruit for consumption. Industry is also continuing to see the benefits of a well structured and coordinated marketing program aimed at increasing consumption and the usage of avocados. The efforts put in by independents and the supermarket chains must also be recognised as contributing to moving the volume. With the volume of crop coming on over the next few years this effort must be continued.

It is good to see some export of avocados happening in a coordinated and structured between various players in the industry, as it grows this will also help returns. Two groups Sunfresh/Super Pak and the Avocado Export Company have been focusing on export opportunities.

Generally the rainfall has been well received and spread out so as not to cause any problems with tree health. Having trees in good shape and water levels plentiful in the storages this region should be able to set another good crop for next season.

Timbercorp going into voluntary administration put the cat among the pigeons earlier in the season with some uncertainty as to what was going to happen as there was some apprehension in the market place as to the impact on fruit flow. Moving forward whatever happens we must all be aware that the trees are there and the volume of fruit will come on in the coming years.

Excitement is building with the upcoming Conference in July and hopefully all those involved in the industry will attend. These get togethers are important as they help to facilitate information flow and give people to talk face to face. A good time will be had by all and while the work side will be important hopefully we get to have a play in Jim's backyard.

## North Queensland Report

By Jim Kochi Avocados Australia Director for the North Queensland Growing Area

At time of writing this report on week 25 beginning 13 June the North Queensland Hass



crop is all but over. I notice that the Infocado report for week 23 some two weeks earlier still showed a trace of yellow in the forecast line so in reality the final result should be a very close forecast equals actual supply. I would add that the NQ crop in total was generally lower than last year by some 10 to 30%. The Shepard crop was down for those who experienced severe rain inundation in February and the root disease and fruit diseases that followed. The Hass crop was lower by a greater margin due to unfavourable conditions at fruit set time, for the want of a more scientific reason.

This season continues to add to that specific information that will answer the most important question an avocado grower can ask. That is:

“What level of supply can the Australian market take before the return to growers takes a dive to sub \$3.00 /kg for medium class 1 fruit (i.e. \$ 16.50 gross for 5.5 kg or \$20 for a Mod6, 6.7 kg)”?

These are the horrible numbers we saw in 2008, last year and we are likely to see them again. Thankfully this year saw better returns but the question still stands. If we can use the Infocado data to give us a hint at the supply level fulcrum then possibly, hopefully, maybe growers may take notice and plan their harvest to take that supply point in mind. We did have the assistance



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## Around Australia continued

of another growers misfortune to moderate the supply for the months May to June and beyond but that situation may not be permanent and the affected properties still have the capacity to yield large crops.

Whilst we have considerable resources employed to investigate ways to grow larger crops by increasing yield or higher packouts or minimising losses or planting more trees with improved rootstocks the individual grower may derive some benefit from the higher returns. But, if collectively all growers find the same secret together then we will all rejoice in growing the biggest, best quality crop ever for almost nothing. And those of us who have to harvest on wet days or on Sunday, Australia Day, Easter, May Day, ANZAC Day, and Queenies Day or God forbid a wet public holiday then we will surely follow the others into voluntary liquidation.

On a brighter note, the forecast for Cairns in July is fine and balmy and the North Queensland growers welcome all conference participants to visit and share our wonderful patch with us. If you don't know what balmy is now, you will by the time you return home.

### Western Australia Report

By Jennie Franceschi Avocados Australia Director for the Western Australia Growing Area



As we head into winter we tend to reflect on the weather, probably because we actually have the time to reflect at all and a cold, wet miserable day makes it easier to stay inside.

Australia has had some extreme weather patterns of late with floods and fires leaving much destruction across the eastern seaboard. So for avocado growers in the west a cool spring may seem like really bad news but in comparison we got off very lightly indeed. It was cold and wet until Christmas which wasn't great for fruit set nor was it great for avocado consumption following a global meltdown in October.

Other problems faced at that time for some WA growers in the south west was a huge defoliation, leaving many 1000's of trees with no leaf cover at all. When driving around you could see row after row of avocado trees hanging a reasonable crop, flowering with only a handful of leaves on the tree. For most orchards seriously affected, they strip picked those trees once picking commenced. This meant some grower's season lasted just a matter of a few weeks rather than over a few months and more volume was harvested in November to mid December than original Infocado estimates.

This is a problem that has not been seen in such large scale before and growers are going into winter trying to keep the carbohydrates up in their trees, hoping to minimise a repeat of the issues they faced in 2008.

With the cold wet spring and half of summer, as well as a storm

that went through mid December, the expectation was that the crop would be way down. While the crop is down some growers are more effected than others and likewise some pockets have huge sets and some none or very little.

It seems to me, from what I have seen, that the growers who do not use Sunny, who manage their picking, i.e. start when the fruit is mature and systematically work through their orchards doing 2 or 3 picks have crops every year that only vary slightly. It's the ones that hang the crop until late hoping to maximise returns in a Christmas and post Christmas market or at times not even start harvesting until Feb / March, who push their trees into bi-annual bearing and once in that state the chainsaw method of canopy management is the only likely way to bring them back.....or a bulldozer.

The 2008/2009 season had twice the volume of the previous year and this was the season that saw growers complain on returns. After talking to some fellow board directors it occurred to me that what Western Australian growers consider a bad return, a Queensland grower considers a great return and what a Western Australian grower thinks is a good return a Queensland grower thinks is unachievable. So considering the 1000's of trees in Western Australia that are between just planted and 4 years old, large volumes out of Western Australia are a sign of the times and price will be effected. We are fortunate though that the East Coast growers get people eating avocados, because there is volume and lower prices and we benefit from that as we harvest during summer and the eating pattern has been set.

I hope to see many Western Australian growers at the conference. From attending Simon Newett's workshops here in Western Australia it is apparent that growers over here are very concerned of a few matters, the main one being bi-annual bearing. The Conference has some great content and there are workshops specifically on the subject of bi-annual bearing. A lot of time and effort has gone into Conference content matter to try and meet all the vast array of issues faced by growers across the country. I would like to think there will be a good attendance, as information transfer is a two way street.

I hope our winter is mild, our spring magnificent and the market continues to stay strong

See you in Cairns.

### Tri State Report

By Colin Fechner Avocados Australia Director for the Tri State Growing Area



While this area has been getting some rain there has not been enough to have flows into the river system. In South Australia we will start the year on a 2% allocation. We are all hoping and praying for good winter rains to start putting water into the storage of the Murray Darling system.

Growers of citrus and wine grapes are doing it tough. Low citrus prices and a lot of grapes have been harvested at below cost of production. There are a lot of areas of all crops that have been left to die because growers can't afford to lease water.

Generally the avocado trees are looking good and healthy for those who have leased enough water and if we get enough water there should be an above average flowering this spring. The avocado size is very variable for this year with quite a lot of small fruit, this was due to the extreme temperatures during February.

Wednesday 17 June was the last of Simon Newett's Study group days in Renmark with a field walk at Nick and Sally Hobbs. During the day the SAAGA AGM was held.

### South Queensland Report

By Daryl Boardman Avocados Australia Director for the South Queensland Growing Area

It's been a true start to winter in our part of the world with some very cold temperatures recorded around the end of the second week of June.

On a brighter note it just makes that trek to Cairns seem like such a good idea. I hope that everyone in the South Queensland area are going, as myself and the other area representatives are having



a competition on who gets the most people from there area at the conference. The winning region gets a special treat organized by the NQ representative but you have to be there to take part. He won't tell any of us what it is.

I am sure that South Queensland will win, as we have, I think the best roll up to all events held. So don't let me down book in a few days off and come and mix with everyone in your industry and make this the must do event for July. So whatever you do get in and book your tickets if you haven't all ready and let's make this region have the best presence that we can.

Talking about roll up numbers since the last report we have had another study group meeting with Simon Newett at Terry Clarks property at Blackbutt and the rollup was fantastic.

Thanks Terry and Simon for a great and informative day. The guys from Farmsafe were well worth the listen as I felt it was an area of all of our businesses that is very close to our heart. We only have one meeting left in this round of which details of the date will be



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## Around Australia continued

sent out closer to the time.

Exports have started to happen through Avocado Export Company and this I believe is one of the most important steps forward the industry has taken to help keep returns at profitable levels domestically from now and into the future.

Talking about returns the market for avocados has remained very good I feel throughout these cooler months with no sign as I write this of dropping any time soon. As most would have seen the first week of June we had the biggest amount of fruit ever consigned as quoted by the CEO, yet prices held and in some cases kept rising.

The thing that I get out of this is that consumers are eating more which is a given and that it would mean that the advertising that Avocados Australia and the chain stores are doing must all be working fantastically. I have no doubt this is the case and that every dollar that is spent on advertising is a dollar well spent.

I wish you all a great harvest in SQ and will see you all at the conference.

### Sunshine Coast Report

By Henry Kwaczynski Avocados Australia Director for the Sunshine Coast Growing Area



I have made a vow never to mention the weather in this column, since rain and drought seem to be a recurring theme. However, I have to ignore my vow and make an exception this time. The Sunshine Coast has, for the past year, had very high rainfall, and this was even more extreme in the last six months. We have had more than 1,000mm of rain since February. While many residents here are astonished at the volume,

the 'old timer' locals remind us that this is normal and we are just returning to what was expected in the past.

With this high amount of rain, you can imagine that the problem of *Phytophthora* is proving to be quite a challenge. It is more than even important to keep up to date with preventative measures for this problem, as failure to act can have catastrophic consequences.

In Queensland we have a newly re-elected premier. The ongoing saga and drama of the proposed Traveston Crossing Dam, between Nambour and Gympie, is still bubbling away. Around \$500 million has been spent on this project and emotions continue to run high, with a very large number of vocal protestors. Whether the dam will actually proceed is still unknown as the Federal Government has not yet given its environmental stamp of approval. Time will tell.

I hope many of you have decided to head to Cairns in July for the 4<sup>th</sup> Australia New Zealand Avocado Growers Conference. The program looks impressive and the speakers will be great. The organising committee has made a special effort to include several new elements, so you will hear about some aspects of our industry which have previously not been on the agenda. These include healthy food and eating and the importance of the avocado in everyone's diet.

Local avocado growers are each year called to spend some time on the Avocado stand in the Horticulture Pavilion at the EKKA (Brisbane Exhibition). This is a great promotional tool for our industry and is a popular attraction, with patrons keen to hear about new recipes, the best variety of avocado to eat and plant, and the health benefits of avocados. I would like to thank local growers who give their time to support this promotion.



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# “Avocados for Life” conference

# ANZAGCo9

## More information on ANZAGCo9 website [www.anzagc.org](http://www.anzagc.org)

In July in the far north of Australia, one of the Australian industry's major avocado growing regions the 2009 Australian and New Zealand Avocado Growers' Conference will be held. Held only every four years in, it is a great opportunity to see an avocado growing region that is usually hidden away by distance, while learning the latest techniques for growing, finding out all about avocado marketing, handling and consuming.

Avocados Australia and the New Zealand Avocado Growers Association welcomes all growers and members of the supply chain to attend the fourth quadrennial Australian and New Zealand Avocado Growers Conference (ANZAGCo9), to be held 21-24 July at the Cairns Convention Centre, Cairns, Australia.

The theme of the conference is “Avocados for Life”. An exciting line up of speakers from the international arena, Australia and New Zealand will present the latest knowledge and understanding of important issues relevant to successful avocado production, handling, promotion, retailing and food service.

The ANZAGCo9 Field Day is an opportunity to see first hand the Atherton Tableland avocado producing region in the far north of Queensland. The field day will include a range orchard, industry research site and packing shed visits.

The avocado industry's key promotion program agencies will be presenting and participating in workshop sessions at the conference, it is a great opportunity for our industry to have input into and understand the promotion program as well as the range and detail of R&D the industry is undertaking with our partners.

The ANZAGCo9 program has been developed with our full supply chain in mind and covers growing, handling and consuming of avocados. There are over 55 presenters over the two day program followed by a field day on Friday 24 July. Areas being covered include:

- Flowering and fruit set: yield, fruit size and production
- New germplasm and global breeding programs
- Pest and disease control strategies
- Integrated production systems and the impact on market access
- Postharvest quality and outturn
- Competing in a global world
- Building demand: promotions, marketing, customer trends and expectations

Our keynote address will be given by Celebrity Chef Valli Little, Food Editor, DELICIOUS Magazine. Valli Little, will be bringing her love and passion for the Australian culinary industry to ANZAGCo9 via a keynote presentation and a cooking demonstration during a lunch break within the exhibition.

## Keynote Speakers

### Ms Valli Little

Born into a family of restaurateurs in the UK Valli was destined to work in the food industry. After a formal training at the Cordon Bleu school in London she embarked on a career as a food consultant and caterer.

On arriving in Australia she worked as a banqueting manager and consultant before returning to England for a year to work with her husband as a cook and butler cooking for the rich and famous in their country homes. The opportunity to open her own Gourmet food store on Sydney's north shore prompted her return to Australia.

For the past five years she has worked as a home economist and food writer working on many successful titles including Sydney Food with Bill Granger and the Food of Italy and Food of France series. As Food Editor of the highly successful ABC DELICIOUS Magazine, Valli is able to indulge her love of recipe and feature writing often producing in excess of 60 recipes each month inspired continually by her travels and love of food.

### Mr Darren Weir

Darren is the Senior Business Manager of Fresh Produce for Woolworths Supermarkets, Australia. He has a Post Graduate Diploma in Management, and is currently studying for his Masters. Darren has 15 years retailing experience both as an Independent Fruit retailer and corporate roles within Woolworths for the last 12 years. Darren has achieved many retail awards within his short career, but sees managing the Woolworths Fresh Produce Business as his most significant achievement to date. He is passionate about retail and enjoys the dynamics the Produce industry brings.

### Professor (Emeritus) Nigel Wolstenholme

Professor Wolstenholme obtained B.Sc.Agric and Ph.D degrees, and lectured for 39 years, in the Horticultural Science Department, University of Natal, Pietermaritzburg, South Africa, retiring in 1998. His research interests were ecophysiology and manipulation of evergreen tree crops, especially avocado. He has had numerous professional visits to Australia, and one to New Zealand, and two sabbaticals with Tony Whiley at Maroochy Horticultural Research Station. He has been invited to talk at most of the World Avocado Congresses, and three of the four Australia/New Zealand Congresses. He is a co-editor and chapter author of the scientific textbook 'The Avocado', by Whiley et al, published in 2002.

### Professor Randy Ploetz

Randy Ploetz is a professor of plant pathology at the University of Florida's Tropical Research and Education Center. He is an authority on diseases of tropical fruit crops, has written over



## AVOCADOSFORLIFE

### 4th Australian and New Zealand Avocado Growers Conference

Tuesday 21 – Friday 24 July 2009  
Cairns Convention Centre  
QLD Australia



# The industry event not to be missed!

This conference incorporates the interests of Avocados Australia [www.avocado.org.au](http://www.avocado.org.au) and New Zealand Avocado Growers Association and Industry Council [www.nzavocado.co.nz](http://www.nzavocado.co.nz) in the industry event of the year!

It is anticipated that over 400 delegates from both countries will attend and represent the interests of the ever growing \$190M Australian and New Zealand avocado industry.

The conference will be held at the award winning Cairns Convention Centre and will feature the Atherton Tableland avocado growing district in far North Queensland. Along with a well developed academic program, an exciting social calendar has been incorporated to ensure delegates and their partner's experience all that Cairns has to offer!

Topics will include presentations and workshops on:

**Avocado Growing:** the basic growing cycle, climate change, alternate bearing, canopy management, high density plantings, rootstocks, pollination, irrigation and many more.

**Avocado Handling:** temperature management, new technologies for disease control and dry matter sorting, packing advances, export requirements and many more.

**Avocado Consumers:** the Australian and New Zealand promotion programs, retail – what is next, education tools, the latest consumer research, avocados in food service and many more.

### Sponsorship and exhibition opportunities now available!

Flexibility is the key and we are happy to discuss with you how best we can tailor a package of benefits to complement your overall marketing objectives and budget. The benefits of your participation are endless making this opportunity one you can not pass up! Please contact the conference managers for more information regarding sponsorship and exhibition opportunities.

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“Avocados for Life” conference continued



300 publications on these topics, and edited/written four books; Diseases of Tropical Fruit Crops is a standard reference on these diseases. Randy received the University of Florida’s Research Foundation Professor Award in 2004, and the American Phytopathological Society’s International Service, and the UF/IFAS International Fellow Awards in 2008.

**Dr Tony Whiley**

Tony spent 35 years with Queensland Department of Primary Industries as a research Horticulturist. In 2002 he founded Sunshine Horticultural Services, a family R&D and Consultancy business providing services to Australian and International horticultural industries and companies. Career achievements have been recognised by the ‘Australian Avocado Growers Federation Award of Honour’ (1988); ‘Maroochy Bicentennial Fellowship Award’ (MSC, 1993); the ‘Graham Gregory Medal’ (HRDC, 1996); admitted as a ‘Member of the Order of Australia’ (2008).

**Dr Grant Thorp**

Dr Thorp is a Senior Scientist with Plant & Food Research in New Zealand. His main research interests are development of new orchard systems for avocado and kiwifruit. Current projects include development of pruning systems for high density plantings of avocado; investigations into how canopy management affects

quality and storage potential of kiwifruit; evaluation of new rootstocks for kiwifruit; and studies on the role of carbohydrates and boron in determining fruit set of avocados.

**Dr Ken Pegg**

Ken is a Post Retirement Associate with Horticulture and Forestry Science. He has had over 50 years experience in the management of plant diseases in tropical and subtropical fruit crops and has been associated with the avocado industry for 35 years. In 1988 he received an Award of Honour for service to this industry. He has also received such Awards from the Australian banana and passionfruit industries as well as a Pisang Raja Award from the International Network for the Improvement of Banana and Plantain. In 1993 he was awarded the Graham Gregory Medal and in 1995 became a Fellow of the Australasian Plant Pathology Society. In 2008 he was made a Member of the Order of Australia and received an honorary DSc from the University of Pretoria.

Other key presenters include:

**Ms Zoe Bingley-Pullin**, Nutritionist and chef Founder of Nutritional Edge

**Mr Jose Luis Obregon**, Managing Director of the Hass Avocado Board (HAB).

**Dr Peter Hofman**, QDPI&F

**Mr Rob Mason**, Bread & Butter

**Dr John Leonardi**, Avocados Australia

**Dr Henry Pak**, New Zealand Avocado Growers Association

For more information and details on the conference please go to [www.avocado.org.au](http://www.avocado.org.au) or call us on 1300 303 971.

A full program brochure, registrations and sponsorship information are available at [www.anzagic.org](http://www.anzagic.org)





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# Long term storage of Hass avocado – the potential for

By Peter Hofman, Roberto Marques,  
Jodie Campbell, Leigh Barker, Terry Campbell,  
Queensland Primary Industries and Fisheries

## Background

Australian avocado production has increased by 66% since 2002, reaching 47.2 MT in 2006/7, and placing pressure on domestic prices because of supply/demand imbalances. Avocados Australia production estimate for the 2009 season is 49.2 MT and 65.0 MT by 2014. Thus, there are strong incentives to increasing market opportunities, either by increasing domestic consumption and/or expanding our export markets. Currently less than 3% of Australian avocado production is exported, mainly to New Zealand and South-East Asia.

Some initiatives have already commenced to facilitate exports. Sunfresh Marketing Cooperative Ltd has been developing export markets into Asia for over 10 years. Several Avocados Australia/ HAL projects (AVo1003 - Avocado export market intelligence, AVo2016 - Investigation of Market Opportunities for Australian Avocados in Hong Kong, and AVo6010 - Export Development for the Australian Avocado Industry) have investigated export market opportunities. In 2008, an “Asian Markets for Horticulture Initiative” (AMHI) project, funded by Queensland Primary Industries and Fisheries (QPIF), in collaboration with the Queensland State Government, assisted Sunfresh to improve exports into several Asian countries.

Sunfresh has identified export opportunities in the European Union (EU), but one of the major constraints is the current seafreight duration from Brisbane to Europe of about 39 days. Australian and overseas research indicates that outturn quality reduces significantly with longer storage times (mainly from increased flesh diseases and physiological disorders), particularly from about 25 days onwards.

Both the quality of fruit at the start of storage, and the storage system used are significant factors in final fruit quality. The two main sea freight systems used by other avocado exporting countries are controlled atmospheres (CA) and SmartFresh (1-MCP; an anti-ethylene agent that delays the action of ethylene in triggering ripening). In addition, we have been looking at 1°C storage required for fruit fly disinfestation using a 6°C/three day pre-conditioning treatment (Hofman et al., 2003). The potential for this system to allow more than 30 day cold storage was unclear.

A combined effort between Sunfresh, QPIF and HAL via the projects “Avocado export market development and expansion to Europe, Singapore and Thailand” (AMHI) and “Australian avocado export development: static freight container trials to assess impact of long-term storage” (HAL/Sunfresh project AVo7031) assessed these storage systems. Fruit were obtained from six growers in the Bundaberg region and held in a standard Maersk

20 foot CA container for 42 days. Fruit from the same growers were also stored under air, or treated with SmartFresh and held under the same temperatures in the laboratory, or conditioned then stored at 1°C. Most of the fruit were ripened at 18°C on removal, while additional fruit were held for a further 3-7 days at 5°C in air before ripening with or without ethylene. Fruit quality during storage (for laboratory fruit), on removal and at ripe were assessed.

## Experiments

### Fruit

About two pallets of Hass avocado fruit from six growers in the Bundaberg region were picked and packed under typical commercial conditions. Most fruit were packed on farm before transporting to Sunfresh, Palmwoods. In some cases the fruit were transported to Palmwoods in 450 kg bulk bins and packed by Sunfresh. The fruit were packed without liners into 4 kg trays specifically designed for the trial by Sunfresh and Amcor Packaging. The cardboard was double fluted, with holes in the bottom of the tray for vertical air movement. Temperature loggers were used to record fruit pulp temperatures. All fruit were pre-cooled at Turners Transport (Palmwoods) to 5-7°C before loading into the container.

### Treatments

On 29<sup>th</sup> May 2008, the pallets were placed into a Maersk 20 foot CA container. Just before placing in the container, three by 4 kg trays per grower per treatment were sampled for additional storage treatments. In total, the storage treatments were:

- **No storage:** ripened on sampling at 18°C. The fruit were not stored or ethylene treated.
- **Air:** stored at 5°C for 42 days.
- **Conditioned:** fruit conditioned at 6°C for three days then held at 1°C for another 39 days (total of 42 days)
- **SmartFresh™:** treated with 300 ppb for 18 hours at 5°C within four hours of sampling, then stored at 5°C for 42 days.
- **CA:** fruit placed into the CA container and stored for 42 days at about 5°C. (The CA conditions used are confidential.)

Treatments 1-4 were stored in the QPIF postharvest cold rooms at the Maroochy Research Station, Nambour.

After 42 days, all storage treatments were removed and placed at 18°C (no ethylene) for ripening. To test whether ethylene treatment was beneficial, an additional tray per treatment from three of the growers were treated with 10 ppm ethylene for one day at 18°C, then ripened at 18°C.

We also tested whether the fruit could be held in cold storage after removal from CA by holding one tray per treatment from

# seafreight exports

three of the growers for three or seven days at 5°C, before ripening at 18°C without or with 10 ppm of ethylene for the first day.

Delivery air, return air and pulp temperatures at three points in the container, and O<sub>2</sub> and CO<sub>2</sub> concentrations were recorded by the container equipment (results confidential).

## Quality assessment

All quality assessments were done as described in the International Avocado Assessment Manual (White et al., 2005). On removal from storage, fruit were assessed for skin colour, firmness, skin spotting and discrete patches, and at eating soft, for skin colour and internal quality. Skin colour was assessed on a 1 to 6 (green to black) scale. All other defects were rated as the percentage of the skin or volume of the flesh affected by the

defect.

A fruit were considered saleable if it had less than 10% of the flesh volume affected by all defects combined. This was used to calculate the percentage of saleable fruit.

## Results

### Fruit temperatures

Pulp temperature at stowing was about 8°C, increased to about 11°C during loading into the container (not cooled before loading to prevent condensation), and reached the set 5°C within one day of sealing the container (Figure 1). Pulp temperatures remained near the 5°C set temperature during storage, except for a three-day window when the container refrigeration malfunctioned.

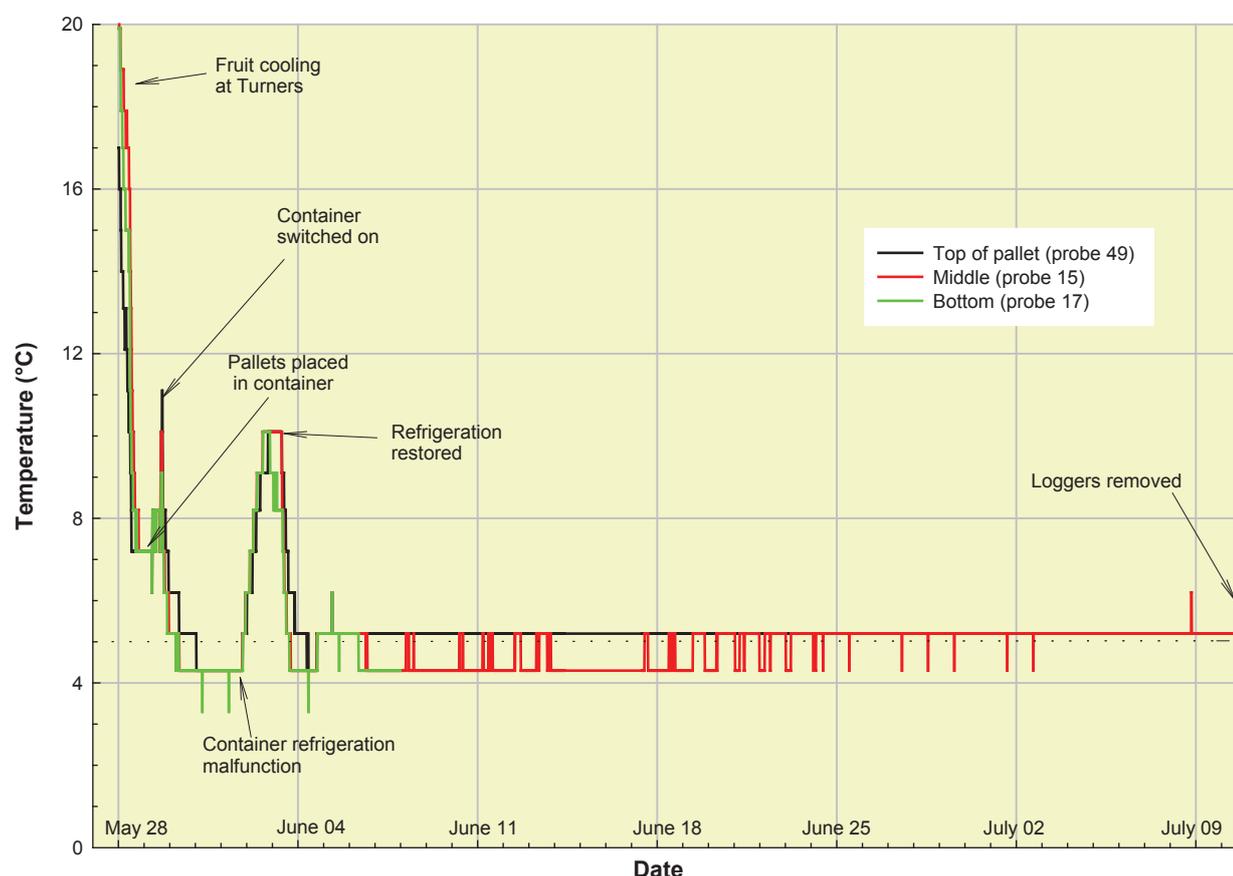


Figure 1 Typical pulp temperatures of Hass fruit measured by inserted temperature loggers into fruit held in the controlled atmosphere (CA) container for 42 days.

## External fruit appearance during storage and at removal

Skin spotting (usually caused by physical damage during harvesting, transport and packing) was obvious before storage, and varied between growers. Spotting became more obvious with longer storage times because the black discolouration around the

damaged nodules increased. At removal, conditioned fruit had the highest skin spotting severity, and SmartFresh and CA fruit had the lowest (Figure 2). The highest severity with conditioning was possibly because the conditioning treatment no longer prevented low temperature damage to the skin during the 42 days storage.

Long term storage of Hass avocado – the potential for seafreight exports continued

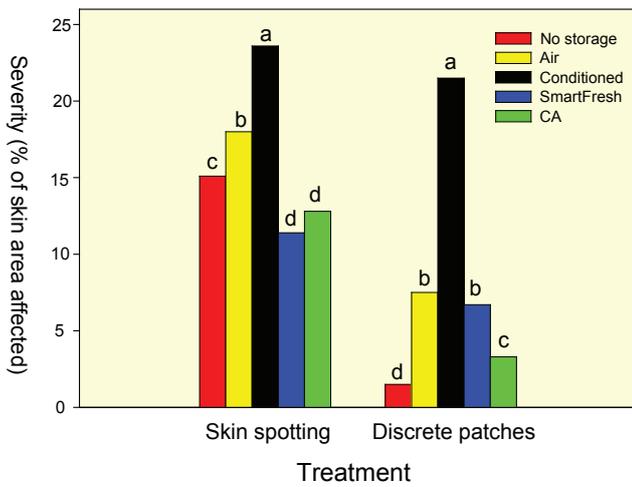


Figure 2 Severity of skin spotting and discrete patches (visually rated as % of skin area affected) of Hass fruit on arrival at the laboratory (no storage), or at removal from storage after 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or controlled atmosphere stored at 5°C. For each defect, there is a 95% probability that the bars with different letters were statistically different (LSD≤0.05).

Discrete patches severity (usually caused by chilling damage to the skin) was low up to 20 days of storage and increased from 30 days onwards. After 42 days the conditioned fruit had the highest discrete patches severity, likely because the conditioning treatment no longer protected the skin from chilling damage at the 1°C storage temperature. Of the storage treatments, CA had the lowest severity (Figure 2).

At removal from storage, the air stored fruit have started to colour and soften, indicating the start of ripening in some fruit

(Photo 1). There was no indication of colouring or softening in the SmartFresh and CA fruit.

**Fruit quality at eating ripe**

Fruit removed from storage and held at 18°C (no ethylene) ripened within 8-12 days (Table 1). Subsequent air storage of 5°C for 3-7 days, with or without one day ethylene (10ppm) did not affect the days to ripe.

The fruit mostly had an attractive, dark purple skin colour when ripe. Very few fruit were black, but this was not considered a commercial problem. The CA fruit had the most attractive and even ripe skin colour of all the storage treatments, with little skin damage (Photo 2). The fruit from the other storage treatments had a more “dull” appearance, which may be related to the lower relative humidity in the laboratory cold rooms, compared to the CA container.

SmartFresh fruit ripened unevenly (Photo 2), resulting in a less attractive tray appearance. The conditioned fruit had the least attractive skin colour because of chilling damage during 1°C storage.

Rots and diffuse discoloration were the main factors reducing flesh quality (Table 1; Photo 3). With air storage, both rots and diffuse discoloration were common, possibly because the fruit had started to ripen slightly during storage. With conditioning, diffuse discoloration was less severe because of the lower storage temperatures, but rots were higher partly because of skin damage during storage. With CA and Smartfresh, both rots and diffuse discoloration severity was very low.

**Table 1** Quality of ripe Hass fruit, either ripened without storage, or ripened after storage for 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or CA storage at 5°C. Fruit were ripened at 18°C with no ethylene

Treatment	Days to ripe	Skin colour (1-6)		Severity (% of flesh volume affected)								
				Body rots		Stem end rots		Diffuse discoloration		Vascular leaching		
No storage	12.4	a	4.6	c	3.7	c	2.3	c	0.4	c	0.0	b
Air	8.6	c	4.5	c	12.1	b	3.8	b	15.5	a	7.0	a
Conditioned	12.2	a	5.1	a	16.7	a	10.2	a	4.5	b	0.3	b
Smartfresh	10.2	b	5.2	a	2.0	d	0.6	d	0.3	c	0.1	b
CA	8.7	c	4.9	b	1.5	d	0.4	d	0.1	c	0.0	b

Means in each column with different letters are significantly different with 95% confidence (LSD≤0.05).

AAbout 95% of the CA and SmartFresh fruit were saleable (i.e. with less than 10% of the flesh volume with defects) at eating soft (Figure 3). This was similar to the saleability of the ripe,

non-stored fruit. Saleability was much lower with air storage and conditioning (31-47%) because of more rots and diffuse discoloration.

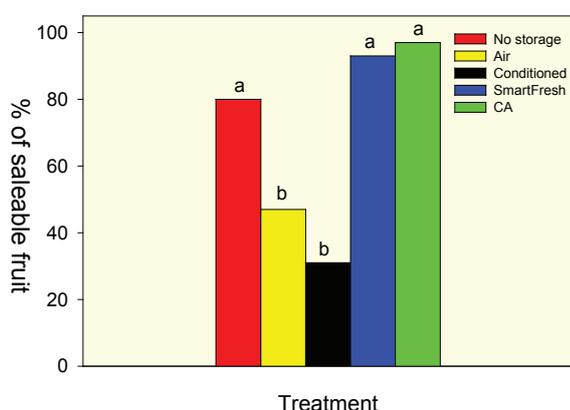


Figure 3 Percentage of saleable ripe Hass fruit based on flesh quality. The fruit were either ripened without storage, or ripened after storage for 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or CA storage at 5°C. Fruit were ripened at 18°C with no ethylene. Bars with different letters are significantly different with 95% confidence ( $LSD \leq 0.05$ ).

Storage for a further 3-7 days in air at 5°C did not reduce saleability compared with ripening immediately after removal (data not shown). Ethylene very slightly increased flesh defects, possibly because the treatment caused a slight stress to the fruit without the benefit of more rapid ripening. However, the treatment did not affect the % saleable fruit, but did not cause more even ripening either. With seven days additional storage, the time from removal from CA to ripe was about 15 days. The results suggest that a seven-day holding/distribution period at 5°C was not detrimental to fruit quality, and that ethylene did not provide much benefit.

## Recommendations

- It is likely that the severity of skin spotting observed in this trial could cause a downgrade from first to second grade in the EU market. Picking and packing operations need to be improved to reduce its severity.
- Time from harvest to container packing should be minimised. We suggest that the container be loaded at the production area, with the fruit picked and packed on the same day, forced-air cooled overnight and placed in the container the next day (ideally no more than 24 hours from picking).
- The results suggest that CA is the most suitable system for 40 day seafreight. SmartFresh has potential, but the uneven ripening needs to be addressed (maybe with ethylene treatment after removal).
- Following CA storage, fruit can be stored for a further seven days at 5°C (no CA) with no loss of ripe fruit quality. Ethylene treatment after removal gives no beneficial effect.
- In this trial, CA produced excellent outturns. However, shipping and commercial outturn conditions will be less reliable than in this trial, so continued attention to best practice on farm and postharvest is required. Long storage stresses the fruit and quality can easily be lost. Regular outturn assessments of the exported, ripe fruit will be important in monitoring and improving our export systems.

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Long term storage of Hass avocado – the potential for seafreight exports continued

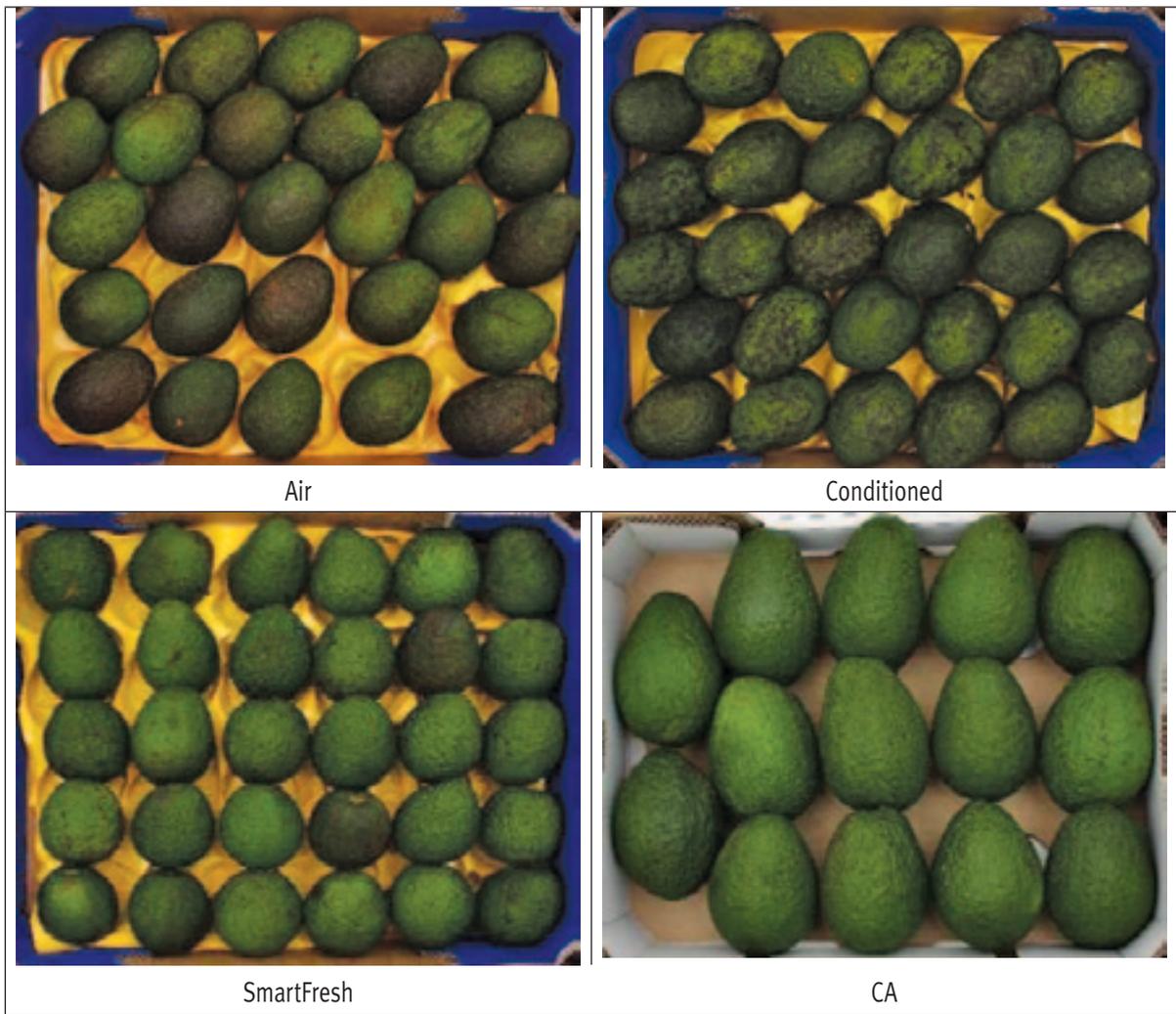


Photo 1 On removal from storage. External quality of Hass avocado fruit stored for 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or stored under CA at 5°C. Note the darker skin with air storage compared with SmartFresh and CA, and the discrete patches with the conditioning treatment because of chilling from 1°C storage.





Photo 2 After storage and ripening. External appearance of Hass avocado fruit stored for 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or stored under CA at 5°C. Fruit were ripened at 18°C with no ethylene. Note the more uneven ripening with SmartFresh treatment.

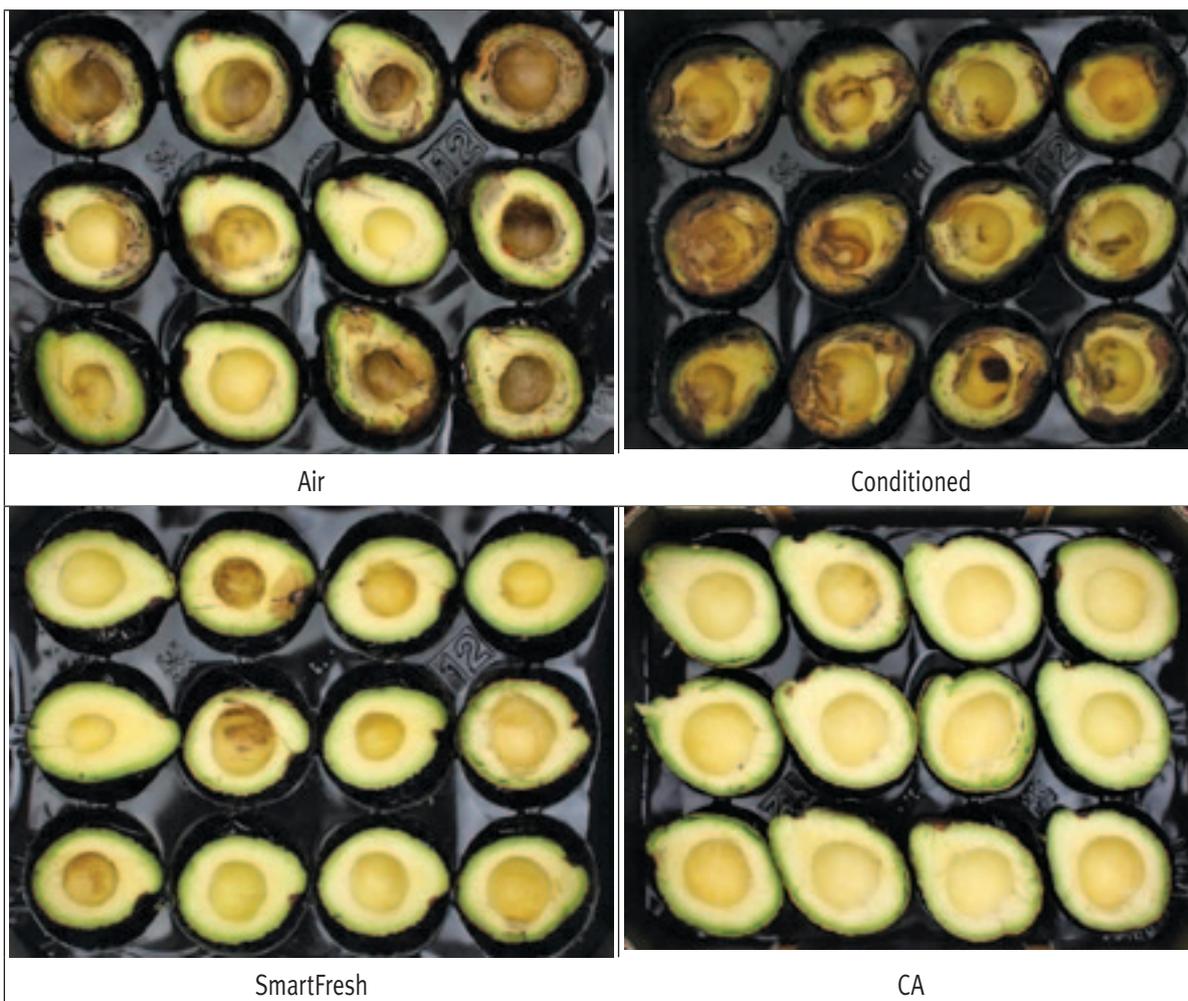


Photo 3 After storage and ripening. Internal appearance of Hass avocado fruit stored for 42 days either in air at 5°C, or at 1°C after conditioning for three days at 6°C, or treated with SmartFresh before storing at 5°C, or stored under CA at 5°C. Fruit were ripened at 18°C with no ethylene. Note the greater rots and physiological defects (mainly diffuse discoloration) in the air and conditioned treatments compared with SmartFresh and CA.

# Evaluation of sustainable orchard management practi

By John Leonardi, Avocados Australia

## Introduction

There are increasing demands on growers to optimise fruit yield and quality, reduce chemical use, develop market opportunities and meet consumer expectations to remain competitive. An increase in the public awareness and concern for the environment has also led to an increase demand for 'safer' food and more environmentally sensitive production methods. Recent figures from the Australian Organic Market Research Report (2008) identified that 40% of consumers have purchased organic food in Australia to be above \$0.5B and the 2007 farm gate value in excess of \$231,000,000 which represents an 80% increase since 2004.

There are several products and orchard management practices either being used by growers or recommended by various companies for use in avocado production, including organic mulches, natural mineral products, compost teas, molasses, kelp and fish based products.

The objective of this project "AVo8o2o: Evaluation of sustainable orchard management practices for extension into general industry standards to reduce costs" is to:

- identify sustainable practices that are currently employed by avocado growers across Australia
- conduct trials to evaluate the effectiveness of these strategies against current industry standards
- provide recommendations on the most promising practices for inclusion into a revised orchard management system

## Approach

Selection of sites:

- Identify sustainable management practices used by avocado growers across Australia.
- 3-5 sites will be selected from each of the major avocado production areas including North Queensland, Central Queensland, South-East Queensland, Northern New South Wales, Central New South Wales, Tri-State and Western Australia.

Evaluate the selected orchard management sites:

- Assess the most promising orchard management systems identified in each region during the course of the project.

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- Information on tree age and spacing, nutrition, irrigation, pest and disease management, details of activities and timing and costs of operations for each site will be collected.
- The timing of phenological events such as flowering, vegetative flushing and fruit maturity at each site will also be recorded.
- The effectiveness of each orchard management practice in terms of cost of operation (\$/ha), impact on tree health, yield (t/ha), fruit size and quality (pack-out figures and reject percentages) and the net return per hectare will be determined.

Conduct field trials:

- The effectiveness of a range of products and orchard management practices either being used by growers or recommended by various companies/consultants will be evaluated.
- Field trials will be conducted to test the impact of these strategies compared with industry standards on tree health, fruit yield and quality. Fruit will be harvested at maturity and yields (t/ha), fruit size (g) and quality (incidence of fruit rots and disease) will be determined.

Dissemination of outcomes:

- Results will be reported quarterly in Talking Avocados.

- Field days will be held in each of the major growing regions at the end of the project to demonstrate sustainable orchard management practices.

### Grower participation sought

I would like to hear from growers who are using sustainable management strategies in their orchards. Your experiences and contributions may provide valuable information to the national program.

Interested growers can contact me:

John Leonardi  
 Avocados Australia  
 on 07 3846 6566  
 or 0400 113 787 or  
 email: [j.leonardi@avocado.org.au](mailto:j.leonardi@avocado.org.au)



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# Report on *Phellinus noxius*, the cause of brown root rot

By Elizabeth Dann, Luke Smith, Ken Pegg,  
Michelle Grose and Geoff Pegg  
Queensland Primary Industries and Fisheries

This paper reports on a scoping study undertaken within project AVo7000 to assess the spread and severity of brown root rot in major avocado growing areas of north eastern Australia. It includes information from the literature on host range and distribution, as well as potential control options and ideas for further research.

## Introduction

The fungus causing brown root rot, *Phellinus noxius*, is widespread among tropical and subtropical regions of southeast Asia, Africa, Oceania (including Australia), Central America and the Caribbean (Pegler and Waterston 1968), and Japan (Sahashi et al. 2007). *P. noxius* has a wide host range, known to infect more than 200 species from over fifty plant families (Ann, Chang, and Ko 2002). In undisturbed rainforest environments, it is an important wood decay and recycling agent, however, where monoculture plantations or orchards have replaced native rainforest, the fungus may infect and cause serious losses to production through tree deaths. Overseas, it has caused significant losses through tree deaths in hosts such as rubber, oil palm, tea, mahogany, teak (Farid et al. 2005), cocoa (Dennis 1992), longan, litchi, pear, persimmon (Ann, Lee, and Huang 1999; Ann, Chang, and Ko 2002) and *Acacia mangium* which has been widely planted in south east Asia for pulpwood (Eyles et al. 2008). It was reported to cause 10% mortality in plantations of mahogany in Fiji and 50% mortality in *Pinus merkusii* in Indonesia (reported in Bolland, 1984). Most hosts are woody plants, although some herbaceous species are also susceptible. Interestingly, mango (*Mangifera indica*) and citrus (*Citrus reticulata* and *C. sinensis*) were reported to be highly resistant or tolerant in artificially inoculated trees (Ann, Lee, and Huang 1999), despite previous records of the disease in these species (Ivory 1996). *P. noxius* is known to cause disease in avocado in Taiwan (Ann, Chang, and Ko 2002), however, this paper represents the first report of brown root rot caused by *P. noxius* in avocado (*Persea americana*) in Australia.

## History of *Phellinus noxius* in Australia

In Australia, fungal fruiting bodies from hoop pine (*Araucaria cunninghamii*) were tentatively identified as early as 1952 as the basidiomycete *Fomes noxius* (later reclassified as *Phellinus noxius*), and the identity of later collections was confirmed (Bolland 1984). *P. noxius* is probably the most destructive root pathogen in hoop pine plantations in Queensland leading to significant losses. It is also causing death of *Ficus* spp. and other trees in urban parks and gardens (Hood 2003). Pathogenicity testing (artificially inoculating plants with pure isolates of

the fungus to prove the cause of the disease) unequivocally demonstrated that *P. noxius* was indeed the primary disease-causing fungus (Bolland 1984).



Plate 1. An avocado tree with fruit still hanging which had recently declined rapidly and died as a result of brown root rot.

Death of avocado trees successively down rows, resembling Armillaria root rot in other tree species, was first noted on the Atherton Tablelands in Queensland in 2001. The first positive identification of *P. noxius* causing tree death in avocado occurred in 2002 from the Maleny district of the Sunshine Coast hinterland in Queensland (Geoff Pegg, QPIF culture accession number BRIP 39219). The orchard is in close proximity to natural rainforest with many species, primarily *Ficus* sp. and *Argyrodendron trifoliolatum* (brown tulip oak), known to be infected with *P. noxius*. Brown root rot was not known to occur in avocados anywhere in the world prior to this positive identification in 2002.



Plate 2. Death of trees along a row, with the most recent death at the far end, typical of progressive death due to root to root infection by *P. noxius*.

# , in Australian Avocados



Plate 3. A particularly severe infection “stocking” showing the actively growing white coloured mycelium at the margin. Despite the advanced nature of the stocking, the tree was only just beginning to lose leaves and die.

## Symptoms

Usually, the first obvious symptom of brown root rot is rapid tree decline and death. Foliage may transform from green and healthy to wilted and dead within a few weeks. Trees with full crop loads may suddenly die prior to harvest, with the fruits still hanging (Plate 1). An examination of the collar of the trunk (at ground level) and the roots (if exposed), reveals an encrusted mass of soil, twigs, stones etc. intermingled with, and held together by the brown mycelium, sometimes with an actively growing white margin (Plate 3), which melanises and eventually turns black. This encrustation girdling the trunk at ground level is known as the “stocking”, and is diagnostic of the disease (Plates 3,4). Old, dead encrustation is black and brittle, and *P. noxius* cannot be isolated from this old “stocking” material.

Underneath the stocking encrustation, the attacked wood is discoloured reddish brown or brown mottled with white patches (Plate 4). In advanced stages of decay, the wood becomes light, dry and friable and honeycombed, and a brown network of lines appears on the surface of the wood under the bark. Fruiting bodies, although uncommon, occur in two forms. The resupinate form is seen on the underside of fallen logs, and between buttress roots of *Ficus* spp., and the bracket form is more often seen on dead hoop pine trees in higher rainfall areas such as northern Queensland.

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## Report on *Phellinus noxius*, the cause of brown root rot, in Australian Avocados continued

The spread of the disease can occur in two ways. Infection of freshly exposed tree stumps or pruning wounds can occur via airborne spores (basidiospores) from a nearby carpophore (the “bracket”-like fungal fruiting body, although these have not yet been seen on avocado). Or infection can take place when roots contact infested woody matter present in the soil, and thus spread via root-to-root contact. The successive death of trees along a row is most likely due to root-to-root contact (Plate 2).

### The scoping study

Several orchards across the Atherton Tablelands, representing an area of approximately 600 km<sup>2</sup>, Childers/Bundaberg (approx. 300 km<sup>2</sup>), Sunshine Coast of Queensland and Northern New South Wales production areas were visited from 2007 to 2009, or samples of diseased trunk were sent to our laboratory. It must be noted that the surveys were not all inclusive, ie. not all properties in the Atherton and Bundaberg/Childers area were visited, and for privacy, the report will not identify affected properties. Samples from actively growing infection stockings were collected from one to five affected trees (more samples were collected from a block where several trees were affected) and plated onto malt extract agar containing 1% w/v streptomycin and 1 ppm benomyl. Cultures were identified by morphological features of the hyphae. In some cases old, non-viable infection stocking was observed on lower trunks of trees, but samples were not collected.



Plate 4. Part of an infection stocking has been cut away showing that attacked wood is discoloured reddish brown or brown mottled with white patches of mycelium.

*P. noxius* was confirmed on 17 out of 18 properties visited on the Atherton Tablelands, including in mango at 2 sites. It was also confirmed from 3 (and suspected on a further 2) orchards in the Childers/Bundaberg area, where 2 properties visited were apparently free of the disease. It has been confirmed on one orchard at Maleny and 2 orchards in Northern New South Wales. Losses were particularly severe (approx. 10% tree death in affected blocks) in at least 4 orchards visited, and attempts to

replant in infested soil failed. To date, no fungal fruiting bodies containing the basidiospores have been found on avocado.

Economic assessment of the impact of the disease on each orchard, and the industry as a whole is difficult, but conservative estimates may be calculated. For a property which has minimal damage or tree loss from *Phellinus*, say the death of one tree per hectare in the first year, equivalent to an average loss of 50kg fruit (or about \$120), plus \$150 per tree for removal, mulching and replant costs, so approximately \$270/ha loss. In the next year, however, one tree either side would most likely die, so the cost multiplies to \$810/ha, and so on for many years. In one of the worst affected orchards, an estimate of 10% tree death was suggested. This would be something like 20 trees per hectare (given an average tree density of 200 trees/ha), and the loss estimate escalates to \$5400/ha for the current year alone. Again, if the spread of the disease is not controlled, then whole orchards may be lost. Another small block with very large trees we visited had approximately 50% dead trees. Given that the larger trees would have yielded 100kg each in prime production, the estimate of crop loss for the current year only for that small block (about 120 trees) is over \$14 000 (the removal and replant cost was not factored in here). The total loss in production over the preceding 10 years may be close to \$100 000. These estimates do not take into account the cost of control, replanting to another crop, or decline in resale value of the orchard.



Plate 5. The brown colour of the mycelial mat of *P. noxius* proliferating between the trunk of a recently replanted young tree and the trunk guard. The replanted tree had died.

An interesting observation made in a couple of severely affected blocks was that the above-ground development was variable, and the degree of development of the stocking did not necessarily correlate with the health of the tree, ie. a tree may have died from brown root rot but the characteristic stocking on the lower trunk was not present, and, conversely, the lower trunk may be completely enveloped by stocking (eg. up to 60cm above the soil surface in a few trees observed), yet the tree had not yet died (Plate 3). This variability is also observed and reported for hoop pines (Bolland 1984).

It was obvious that infectious material was still present in the soil, even after the tree (and sometimes the stump) had been removed. Attempts to replant young avocado trees close to the sites of dead trees usually failed. This was observed on several occasions. In one case where the replanted tree had recently died, the *P. noxius* fungus had proliferated between the trunk of the tree and the nursery gro-bag, demonstrating the brown colour of the mycelial mat before it melanised and turned black (Plate 5).

Plate 6. (Right) Death of avocado regrowth arising from a stump.

The practice of thinning every second tree and not removing the stump and roots, exacerbates the *Phellinus* problem, as it provides a food source and debris for survival. Note that an older tree in the background has died from *Phellinus*.



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Report on *Phellinus noxius*, the cause of brown root rot continued

**Control options**

Current control measures for avocado depend on routine inspection and removal of diseased trees and as much infested wood from the soil as possible, although this is not always practical. One tree either side of dead or dying trees should also be removed, even if it is apparently healthy, as its root system may be infected. Diseased material should not be used as mulch, as this is likely to increase the spread of the fungus. If practicable, root barriers to a depth of about 1.2 m and standing approximately 10 cm above the soil surface should be installed, thereby effectively isolating the diseased patch of orchard. Establishment of good ground cover to hasten the decay of root fragments containing the fungus may be useful.

There are some promising control options discussed in recent literature, and reviewed for *P. noxius* and other fungal root rot pathogens (Eyles et al. 2008), which could be tested for their efficacy in avocado. A study has shown that woody debris infested with *P. noxius* played an important role in the long term survival of the fungus, and it is likely that it can survive for longer than 10 years, particularly in drier conditions (Chang 1996). As the fungus did not survive when infested wood was submerged in water, it was suggested that flooding infested soils may eliminate the fungus in infested wood and roots, and thus constant irrigation of affected areas for a determined period could be a future control option for avocados. A subsequent study demonstrated that the addition of urea to soil resulted in the generation of volatile ammonia which was lethal to *P. noxius* harbouring in small pieces (less than 3cm diameter) of woody debris in soil (Chang and Chang 1999). Urea is a commonly used fertiliser and thus could be an appropriate control option for avocados, if used as a treatment well before replanting, as ammonia is known to be toxic to feeder roots (Menge and Ploetz 2003). The same treatment should also eliminate

*Phytophthora cinnamomi* infectious propagules. Another field study demonstrated that frequent drenching of infested soils with triadimefon fungicide combined with urea and calcium carbonate resulted in all 3-5 year old grape vines surviving after a 2.5 year period, compared with 14% of grapevines killed by *P. noxius* in the untreated control (Tsai, Hsieh, and Ann 2008). The same group of researchers have evaluated several fungicides for their efficacy against *P. noxius* in laboratory and glasshouse tests (Tsai, Ann, and Hsieh 2005).



Plate 7. Old infection stocking on avocado regrowth has turned black and brittle. While the fungus cannot usually be isolated from such material, it will still be viable in woody root debris underground.



Plate 8. Showing the gaps in an orchard after *Phellinus* has killed several trees. The replants may survive for a couple of years until their roots come into contact with infested debris, and become infected, eventually killing the replant.

Finally, another approach evaluated for control of *P. noxius* and other root rot pathogens is via biological control. Non-pathogenic fungi (the biocontrol agents), may act in several ways, ie. breakdown of woody debris, compete for available nutrients, produce antibiotics lethal to the pathogen, or mycoparasitise the pathogen, as described (Eyles et al. 2008). While biocontrol agents may perform well under controlled glasshouse conditions, they are rarely successful under field conditions, and thus are not readily commercialised or made available. Isolates of *Trichoderma* spp. fungus have been shown to inhibit growth of *P. noxius* *in vitro* (Lim and Teh 1990), and when introduced to the rhizosphere of rubber seedlings, growing in soil infested with *P. noxius*, plant growth was improved, and early brown root rot disease symptoms were reduced (Jacob, Joseph, and Jayarathnam 1991).

### Further work

The scoping study undertaken has identified several avocado orchards with brown root rot disease in the major production areas of the Atherton Tablelands and Childers/Bundaberg. It was also identified from two properties in Northern New South Wales and one in the Sunshine Coast hinterland of Queensland. It is highly likely that on these properties the disease will continue to kill avocado trees, and that more orchards will be identified as having brown root rot disease. The disease ranges in severity at these sites from minor problem, where only a few trees have been affected, to extremely severe, where the spread of the disease is such that significant proportions of whole blocks have been affected, and are not amenable for replanting of avocados. Thus, the disease is obviously having a significant economic impact in the worst affected orchards.

With the cooperation of growers, it may be possible to test some

potential management strategies *in field*. This would include testing the efficacy of various systemic fungicide treatments, such as those identified in the literature and discussed above, which are not currently registered for use in avocado, but which are known to be effective against basidiomycete fungi. The application of urea and/or keeping soil wet for a long period of time to effectively eliminate the pathogen from affected areas, as described above, would definitely be worth testing in field trials. It would also be useful to conduct viability tests on buried wood infested with the fungus, to determine the length of time the fungus remains alive and capable of infecting new roots, and what conditions (other than saturating soil already mentioned) would favour the breakdown or decline in viability of the fungus, e.g. heavy mulching versus minimal mulching, growing green manure crops etc. Another approach would be to replant infected areas with a range of potential alternate hosts, to determine whether the land could be returned to profitable production with a different crop.

Alongside this, further screening of large numbers of fungicides and alternative hosts under glasshouse and laboratory conditions may quickly provide promising candidates for field testing. Continued investigations of the genetic relatedness of the different isolates of *P. noxius* would be extremely useful, and would for instance, provide further information on the mode of spread. For instance, genetic fingerprinting or DNA sequencing studies would help to determine whether some apparently isolated outbreaks occurred via infection of cut surfaces eg. stumps or pruning wounds via the wind dispersed basidiospores of *P. noxius*. This work is currently being carried out by Michelle Grose and Geoff Pegg (QPIF, Indooroopilly) in a separate project funded by ACIAR.



Plate 9. A “birds eye” view of an orchard showing areas of tree death due to *Phellinus*. The orchard also had a problem with *Phytophthora*. The orchard is next to remnant rainforest (right of picture) with known *P. noxius* tree deaths.

## Report on *Phellinus noxius*, the cause of brown root rot continued

### Thanks to

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# Avocado R&D and marketing program overview



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John Tyas

Industry Services Manager Horticulture Australia

Horticulture Australia Limited (HAL) is a national research, development and marketing organisation. HAL is an industry-owned company that invests more than \$80 million annually in research and development (R&D) and marketing projects for the benefit of horticulture. HAL works in partnership with the horticulture sector to invest in programs that provide benefit to Australian horticultural industries. The avocado industry invests through HAL in R&D and marketing programs using avocado levies and voluntary contributions. All R&D funds are matched, dollar for dollar, by the Australian Government through the HAL program.

The avocado investment program is reviewed and adjusted annually in line with the industry's strategic plan, developed in 2005. There are three key platforms of the strategic plan which are being addressed through various projects: 1. Projects to drive **Revenue Growth**, 2. Projects to improve **Production and Marketing Systems**, and 3. Projects to facilitate sound **Industry Management**.

Projects relevant to the avocado industry are funded through four different mechanisms and these are:

1. Avocado grower levies,
2. "Voluntary contributions" (VC projects),
3. "Multi industry" projects where the avocado industry jointly funds a project with one or more industries (MT or HG projects) and
4. "Across industry" projects that are funded by all horticultural industries including avocados. (AH projects)

VC projects that relate to avocados can be found below with the grey shaded background.

MT or HG projects funded by avocado levies can be found below with the yellow shaded background.

AH projects can be found below with the blue shaded background

Below is a snapshot of the current avocado program funded through HAL. For further details on the specific projects, we encourage you to contact the relevant Principle Investigator.

## REVENUE GROWTH

### AV09501 Avocado domestic promotion program

**Project Start:** 1-July-2009

**Project Completion:** 30-June-2010

**Principle Investigator:** Ms Gunjan Tandan, Horticulture Australia Ltd

**Service Providers:** Creative: Gallery De Pasquale, Digital: Liquid Interactive, Media Buying: IKON, Public Relations: Impact

**Funding source:** Marketing Levy

### SUMMARY

The 2009-2010 Avocado marketing program continues to build upon delivering increased profits back to the growers. This year will see a continuation of the brand proposition of promoting Avocados as a versatile and nutritious fruit. The main target market will consist of female grocery buyers between the ages of 20 and 39, with an income of over \$35,000.00.

The campaign's main objectives are:

- Increase the purchase frequency of occasional users (17% of total users) from 1 purchase cycle per months to 1.5 purchase cycles per month by 2010.
- Occasional buyer (20% of total users), who only purchase avocados once every three months, start buying avocados once a month by 2010.
- To maintain a balance between demand and supply
- Change perception that Avocados are a luxury fruit to become an everyday item

The domestic campaign consists of 6 key activity areas funded from the marketing levy:

1. Consumer Advertising
2. Creative Development and Production
3. Website, Digital and Online Optimisation
4. Nutritionist
5. Food Services Sector Promotions
6. Cooperative Promotions

### Consumer Advertising

The strategy behind media spend has been to find or rather isolate moments where the purchase and consumption of food is considered and to complement these moments with a reminder

## Avocado R&D and marketing program overview July 2009 continued

of the connection between avocados and a wide variety of appropriate meals. This directly relates to the strategic objective identified above- decrease whim purchase and increase planned purchase amongst target audience by making avocados top of mind by showing how versatile avocados are.

The channels have been recommended as the research conducted showed that the target audience view magazines as a key tool to gather information and recipe ideas. The strategy behind magazine selection was to demonstrate versatility through creating drive reach through placement in more engaging environments where readers can spend more time with avocados.

TV, though expensive, will provide avocados with exposure to a large audience. The challenge for TV was to find properties that allowed one to demonstrate the versatility of avocados, utilizing existing creative. The considerations while selecting the appropriate TV mix was: length of time in market (as trying to change attitude of consumers to perceive avocados as a winter fruit which can be used in hot meals), engaging content and audience targeting.

### Creative Development and Production

To support the media channels, the creative strategy will continue in communicating the versatility through the “Add an Avo” message, unique avocado shapes and the usage of recipes. Sampling activities this year will use brand new recipes developed in consultation with Zoe Bingley – Pullin and new Avocado shapes.

A new recipe booklet will also be produced for mothers and adult workers. This book will be specifically designed to drill down a little further and highlight the proposition of “easy, everyday ways to add an avo – on the go”.

### Website and Online Optimisation

The digital objectives are:

- Increase in database/ subscriptions to the website
- Reduction in bounce rates
- Referral to avocado websites
- Clicks from EDM’s sent to consumers back to the avocado website

The tactic in focus during the first year of the digital strategy was to maximise the value offering. This was achieved through the development of a new HTML information website which is sustained by regular content updates. This tactic supported the digital objectives by building the reach, relevance, and search engine optimisation, of the site.

Essentially, the website was delivered so that it would be easier for consumers to find, and has a higher level of user engagement. Within the development of 08/09, a clear focus was established, which encompassed all areas of digital activity:

- Development of a new HTML website

- An online banner campaign
- 4 seasonal EDMs
- Search Engine Optimisation
- 2 Promotional Campaigns: “Launch campaign competition” and “30 days/30 ways Revitalisation program”

### Nutritionist

Zoe Bingley-Pullin has been contracted on behalf of the industry as the avocado spokesperson. Founder of Nutritional Edge, Zoe Bingley-Pullin, has long been passionate about food. A nutritionist (Diploma of Nutrition, Sydney) and internationally trained chef (Le Cordon Bleu School, London), Zoe will help in developing content for the regular monthly updates on the website, be an active contact on the website forum as well as provide content for the EDM’s (electronic direct mailers). The PR campaign will be using Zoe in media releases to further enhance the campaign and gain more media coverage.

### Food Services Sector Promotions

The food services sector holds a great deal of potential in driving a renewed demand and growth for the industry. This year’s activities will include a product performance panel in which a number of key influential chefs workshop the development of the “Masterclass Book” in which menu ideas and a comprehensive list of avocado information will be put together. Furthermore the “Chef Masterclasses” will be bringing together leading chefs to promote the outcomes of these panel sessions and to leverage the insights that were developed during the product performance panel workshops.

### Cooperative Promotions

Based on the success of previous year’s cooperative promotions, an allocation has been made to encourage growers, state organizations, market authorities, wholesalers and retailers to promote in a consistent manner to the nationally developed positioning to build brand equity.

### **AVo8038** *Avocado’s in Primary Schools - Scoping Study*

**Project Start:** 12-Jan-2009

**Project Completion:** 31-July-2009

**Principle Investigator:** Shelly Woodrow, Woodrow Consulting Pty Ltd

**Funding source:** Matched R&D Levies

### **SUMMARY**

The avocado industry is seeking to increase the consumption of avocados amongst school-aged children. The development of an avocado focused educational experience, which includes an avocado tasting component, is one possibility for achieving this

long-term outcome. However, schools already have a crowded curriculum and are not easy to penetrate.

This scoping study will allow the industry to assess the opportunities and to identify the best and most cost efficient approach to engaging with the primary school sector. The scoping study will also provide the industry with the opportunity to canvas the opinion of key stakeholders in the schools sector to ensure the acceptability of an "Avocados in Schools Initiative".

#### **AVo8044** *Implementation of Avocado Food Service Product Performance Panel and National Menu Survey*

**Project Start:** 1-Mar-2009

**Project Completion:** 30-Jun-2009

**Principle Investigator:** Brian Ramsay, Inovact Consulting

**Funding source:** Matched R&D levies

#### **SUMMARY**

This project aims to implement the first stages of the avocado food service action plan developed in 2008-09.

In accordance with the Action Plan, this project will undertake detailed design and implementation of The Product Performance Panel, and The National Menu Survey. Outputs from these activities will include:

- a report confirming and detailing the value proposition and market engagement approach to food service marketing Fresh Avocados that provides the basis for marketing initiatives in 2009/10, and
- a report providing detailed insight into the current use of Fresh Avocados by restaurants, cafes, hotels and clubs.

#### **AVo9012** *Food service - Provedore program*

**Project Start:** 2-Nov-2009

**Project Completion:** 30-April-2012

**Principle Investigator:** TBA

**Funding source:** Matched R&D levies

#### **SUMMARY**

PROJECT UNDER DEVELOPMENT

This project will continue the implementation of the new avocado food service action plan and build on the results from AVo8044.

#### **AVo9013** *Food service – Chefs master classes*

**Project Start:** 1-Dec-2009

**Project Completion:** 30-April-2012

**Principle Investigator:** TBA

**Funding source:** Matched R&D levies

#### **SUMMARY**

PROJECT UNDER DEVELOPMENT

This project will continue the implementation of the new avocado food service action plan and build on the results from AVo8044.

#### **AVo9500** *Avocado 09/10 Export Marketing Program*

**Project Start:** 1-Jul-2009

**Project Completion:** 30-Jun-2010

**Principle Investigator:** Wayne Prowse, HAL

**Funding source:** Marketing levies

#### **SUMMARY**

This project aims to support avocado exports through promotion and market development activities.

The two activities to be supported in 2009-10 are Cooperative Promotions and the Australia Fresh Program. Cooperative promotion activities will be considered for funding through a formal process of calling for proposals.

The Australia Fresh Program is a multi industry marketing project which provides industries with international advertising and access to participate in a range of international trade shows.

#### **AVo8015** *Avocado US market access support*

**Project Start:** 15-Jun-2009

**Project Completion:** 06-Jul-2012

**Principle Investigator:** TBA

**Funding source:** Matched R&D Levies

#### **SUMMARY**

PROJECT UNDER DEVELOPMENT

With the current industry production growth there is a strong need to consider export markets that have a profitable return when compared to Australian production costs. A submission for market access of Australian Avocados to the US was submitted to Biosecurity Australia in 2002.

*Avocado R&D and marketing program overview July 2009 continued*

**AV09000** *Identifying bioactive components and portion sizes in avocados for consumer health*

**Project Start:** 10-Jul-2009

**Project Completion:** 20-May-2011

**Principle Investigator:** Dr Jenny Jobling, Applied Horticultural Research P/L

**Funding source:** Matched R&D levies

**SUMMARY**

PROJECT NOT YET APPROVED

Avocados have long been seen as a nutrient rich food, particularly as they are a good source of heart healthy monounsaturated fats. However, further research reveals avocados contain a variety of bioactive chemicals which may be beneficial to human health. Avocado contains significant amounts of beta-phytosterol, phytosterols are plant analogues of cholesterol which act to inhibit intestinal absorption of cholesterol, thereby further enhancing the beneficial effects of avocado on the cardiovascular system. Avocados also contain vitamins C and E as well as significant levels of the carotenoid lutein, each of which exert antioxidant actions in the body.

An initial search of the scientific literature reveals much of the research surrounding avocado is dated.

This project aims to establish guidelines for the horticultural industry on the regulations governing nutrient claims for avocado. It will also characterise the nutritional content of avocado and the extent of scientific research on potential health benefits and develop recommendations for priorities of the nutritional components in avocado.

The project will also establish a suitable portion size for avocado based on existing government and non-government recommendations and conduct dietary modelling which incorporates the portion size into a healthy, balanced low fat diet.

And finally the project will determine baseline consumer knowledge about the nutritional values of avocado and interest and appeal in potential nutrition and health claims. This information generated from the bionutrient study and the consumer focus groups can be used to develop new information for promoting to consumers the correct portion size and health benefits of eating avocados.

**AV07023** *Avocado weekly retail price survey*

**Project Start:** 25-Jun-2008

**Project Completion:** 30-Aug-2012

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding source:** Matched R&D Levies

**SUMMARY**

The Australian avocado industry is experiencing an extremely large growth phase in production with a 25% increase in 2007 and a further increase of 17.5% forecast in 2008. Creating an environment in which market forces work efficiently to clear product quickly through the market is essential under these conditions. Currently, the retail avocado market tends to operate independently from these market forces thus creating the situation where market signals are not clear and fruit can become backed up in the system. Although growers have a very good understanding of the prices they are receiving for fruit there is not an up to date retail price reporting system to alert them when market forces aren't operating to clear the market. Equally, consumers are also unaware at any point in time as to the price differentials between wholesale prices growers are receiving and retail prices they are paying.

This project is aimed at providing clear retail price data to assist consumers and the market to make informed decisions.

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**MTo8o6o** *Consumer tracking study*

**Project Start:** 1-Dec-2008

**Project Completion:** 1-12-2011

**Principle Investigator:** Steve Sheppard, Brand Story Pty Limited

**Funding source:** Matched R&D levy and marketing levy (multiple industries)

**SUMMARY**

This project provides an on line tracking study to monitor a range of marketing metrics for assorted horticultural industries. The objective is to track consumption, attitudinal and purchasing behaviour and category perceptions; track change in product positioning for the participating industries and their impacts on key performance indicators, and to assist future strategic planning development.

The project uses a national data base for tracking responses via an on line questionnaire. The study is national, with the target market of main grocery buyers.

The study will be conducted in 6 waves over two years with three debriefs to industry, using a total sample of 1800 people.

The outcomes will assist in planning and market development projects by monitoring changes in environmental and market factors affecting the drivers of the horticulture industry.

### **MT08015** *Data collection program*

**Project Start:** 01-July-2008

**Project Completion:** 30-June-2010

**Principle Investigator:** Roger Bramble, HAL

**Funding source:** Matched R&D levy (multiple industries)

#### **SUMMARY:**

This data collection project gives the Fruit, Vegetable and Nut industries access to relevant data in a cost effective manner. This project will fund the collection by HAL of Australian retail market data, indicative wholesale data and export and import trade data.

This data will then enable industries to gain greater insight into the industries seasonal performance and global trading environment as well as providing a high level of quantitative data to support their current and future marketing and supply chain modelling activities.

### **AV08013** *Avocado consumer research*

**Project Start:** 1-Mar-2009

**Project Completion:** 31-July-2009

**Principle Investigator:** Anna Herron, Bread and Butter Research & Planning

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The outcomes of this research will be used to evaluate the previous marketing campaign and will be the foundation for the new campaign moving forward. As the 2008-09 will be the last year in a 3 year strategic marketing campaign, the avocado industry will revisit the consumer research carried out by Bread

and Butter in 2005 to check whether or not the marketing campaign has achieved the objectives and goals which were set out in the beginning of the research. It will also provide the foundation for the next strategic marketing plan.

## **PRODUCTION AND MARKETING SYSTEMS**

### **AV06006** *Scoping of a national avocado quality system and management of avocado industry information systems*

**Project Start:** 01-Oct-2006

**Project Completion:** 30-Sep-2009

**Principle Investigator:** Joanna Embry, Avocados Australia

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The aim of this project is multifaceted. Firstly it aims to identify where the industry currently sits in terms of quality and productivity. It provides a management role to a separate supply chain project aimed at identifying points in the supply chain where issues related to productivity and product quality should be addressed. It also aims to develop a system (based on learning from overseas and other industries) for developing a quality standard and maintaining that standard. Additionally it aims to implement a system for forecasting future production and monitoring changes in productivity over time.

Two of the main issues which impact on the returns to avocado growers are related to fruit quality management and the efficiency of avocado production and marketing systems. Both of these issues are being addressed through this project.

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The implementation of a productivity data collection system and the outcomes from the supply chain project will provide growers with the tools to benchmark their productivity and quality against the industry as a whole and to identify where issues impacting on quality and productivity occur. Similarly the rest of the supply chain including wholesalers, marketers, pack houses, ripeners and retailers will have the opportunity to achieve this outcome with regard to quality. The scoping of a quality management system will provide the potential for businesses to be rewarded for supplying a resulting higher quality product. The crop flow (Infocado) and productivity data collection system will also provide the industry as a whole with more accurate and timely short term and long term information to assist in planning affective marketing programs over time.

### **AV09001** *National Avocado Quality & Information Management System*

**Project Start:** 1-Oct-2009

**Project Completion:** 30-Sep-2012

**Principle Investigator:** Joanna Embry, Avocados Australia

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The aim of this project is to bring together all of the results from AV06006 (Scoping of a national avocado quality system and management of avocado industry information systems) and the supply chain projects that were managed by it and develop and implement an integrated quality and information management system. The supply chain projects managed by AV06006 identified where the industry currently sits in terms of quality and productivity and points in the supply chain where issues related to productivity and product quality should be addressed. It also identified learnings from overseas and other industries for developing a quality standard and maintaining that standard.

AV06006 was also successful in implementing and rolling out a system for managing critical information from sectors of the industry including production and productivity (Orchard Info), Fruit dispatches to market (Infocado - packhouses) and Sales to retail (Infocado – wholesalers and retail price surveys).

The information generated regarding these two critical components of the industry ie. Quality and productivity is now available and in a format which can be used to develop quality and production management systems.

Two of the main issues which impact on the returns to avocado growers are related to fruit quality management and the efficiency of avocado production and marketing systems. Both of these issues are being addressed through this project.

Continued management of the multifaceted information management system in the form of Infocado and Orchard Info

provides industry with accurate production, sales and productivity data on which to make all future decisions.

Development of a framework for and assisted management of a quality management system will provide the industry with a tool to differentiate premium quality fruit. This will assist in targeting different segments of the market.

### **AV08017** *Avocado supply chain education materials*

**Project Start:** 25-May-2009

**Project Completion:** 31-May-2010

**Principle Investigator:** Joanna Embry, Avocados Australia

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The resource audit conducted as part of the supply chain mapping project in 2007 (AV06026) identified all the materials that are available to assist members of the supply chain to improve quality and efficiency. The audit identified a number of gap areas in terms of education materials. This project aims to fill those gaps where the research results are available.

Significant research has been conducted over the past 10 years which still has relevance in assisting members of the supply chain to supply a better quality product to the consumer more efficiently. There are however gaps in the availability of educational materials to assist various sectors to implement these improved practices. Some of the material that is available needs updating to make it more relevant.

### **AV07005** *Development and commercial application of an avocado fruit robustness test*

**Project Start:** 04-Jan-2008

**Project Completion:** 31-May-2011

**Principle Investigator:** Danielle Le Lagadec, QPI&F

**Funding source:** Matched R&D Levies

#### **SUMMARY**

Despite considerable research effort, quality of the ripe avocado flesh (hereafter referred to as fruit quality) remains a problem for the industry, slowing domestic and export expansion. Several research projects have focused on production factors contributing to poor fruit quality. Since fruit quality appears to be influenced by a large number of both biotic and abiotic factors, recent studies have focused on identifying specific fruit characteristics which can be linked to quality, e.g. Calcium or Nitrogen levels in fruit. While good correlations were found in some studies the results were not consistent, and it has been difficult to reliably manipulate fruit minerals concentrations to improve quality.

With increased market supply and likely increased on-tree and market storage, quality issues will become more important to the Australian industry. An accurate knowledge of fruit quality will then become an important criterion on which growers can base marketing decisions (for example the ability of a consignment to withstand storage after harvest).

In this project, a fruit robustness test applied before the start of commercial harvest will be evaluated as an indicator of expected retail fruit quality. The applicability of the test to the Australian industry will also be evaluated to establish how the test can be used in marketing decisions, and estimate the cost benefit to growers and consumers.

### **AVo8018** *Development of an avocado ripening manual*

**Project Start:** 15-Jun-2009

**Project Completion:** 31-Jan-2011

**Principle Investigator:** Terrence Campbell, QPI&F

**Funding source:** Matched R&D Levies and voluntary contribution

#### **SUMMARY**

##### PROJECT UNDER DEVELOPMENT

This project aims to improve avocado quality outturns through the development of best practice in avocado ripening. Ripening of avocados has been an under researched and documented process within the avocado supply chain. The ripening process is a critical point in determining the quality outcome for avocados and quality improvement is an essential industry strategy to improve consumption. The project aims to document the ripening processes and procedures for avocados.

### **AVo8034** *Avocado retail quality monitoring- Phase II*

**Project Start:** 01-Apr 2009

**Project Completion:** 31-Oct-2010

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

As part of its key strategic focus on improving the quality of the avocados offered to Australian consumers, Avocados Australia and Horticulture Australia Limited (HAL) are continuing a project to assess and improve current industry practices affecting customer and consumer satisfaction with the end product. The industry is adopting a staged approach to achieving this.

The Supply Chain Improvement project (AVo6009) is a two phase project which has been developed to specifically address objectives P1.1, P1.2, P2.1 and P2.2 in the strategic plan. The first 12 month phase was aimed at identifying where the industry

currently sits in terms of quality and efficiency and identification of points in the supply chain where further work is required to make improvements in these areas.

This project forms part of phase 2 which has resulted from the recommendations of phase 1 to address the gaps.

Phase 1 has produced 3 outputs

1. Benchmarks for industry performance in eating quality (primarily maturity and freedom from rots or bruising) - from the consumer research and sensory research conducted in 2007 and 2008
2. A Supply Chain Resource audit of the Industry.
3. A Supply Chain situation analysis for the industry

This project forms part of output 3. To date, consumer sensory testing has been completed to determine quality levels which provide an acceptable consumption experience for consumers and hence do not negatively impact on future purchasing decision. The results from this work in summary have indicated that consumers prefer fruit of maturity between 22% and 28% DM creating a competitive advantage by supplying fruit increasingly along this range. The results indicated that 85% of consumer prefer to buy avocados at a level of ripeness that they can consume that evening and that that level of ripeness is in the range of ripe to soft ripe and consumers indicated that any internal quality defects to more than 10% of the overall flesh at all price points would impact negatively on their next purchase intent.

The 1st stage of this project was aimed at measuring how much fruit at the retail level currently fulfills consumers quality demands and where there are significant differences in quality, between store types and/or seasons.

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**MT06020** *Improving Market Access R and D for the Australian Horticultural Industries*

**Project Start:** 1-Jul-2006

**Project Completion:** 1-Jul-2010

**Principle Investigator:** Various providers. Contact Brad Wells, HAL

**Funding source:** Matched R&D levies (Multiple industries)

**SUMMARY**

This multi industry project aims to implement the Horticulture Market Access R&D Plan. A number of projects are funded through contributions from relevant industries to implement the plan. The current projects supported from the avocado industry are:

- MT06022 – Generation of dimethoate and fenthion samples to maintain market access. This project aims to provide data to support ongoing access to dimethoate and fenthion
- MT08035 - Providing data packages for new fruit fly control technology. This confidential project aims to test the Syngenta product, Lufenuron, for its potential to be used in field control of fruit fly species endemic to Australia.
- MT08036 - Ecology and pre harvest control of fruit flies for systems approaches to market access for fruit fly host commodities. This project will conduct a formal study of Queensland fruit fly movement at different scales as it relates to the improved use of MAT and bait sprays for pre-harvest control. This will help to develop systems approaches to control Queensland fruit fly

**AV09005** *Coordination of Export Development for Australian Avocados*

**Project Start:** 1-Jul-2009

**Project Completion:** 31-Jul-2011

**Principle Investigator:** Louis Grey, Avocado Export Company

**Funding source:** Matched R&D voluntary contribution

**SUMMARY**

PROJECT NOT YET APPROVED

The Australian Avocado Industry is facing increased international competition, increasing supply and is currently heavily focused on the domestic market. 75% of Australian Avocados are grown in Queensland and Australian Avocados account for 2% of world Avocado production and less than 0.2% of world exports in 2002/3. New Zealand has marketed between 3,000 and 6,000 tonnes of Avocados in Australia in recent years. Australia is by far New Zealand's major avocado export market.

New Zealand's Avocado production could rise to over 40,000 tonnes by 2012. Production in 2002-3 was said to be 14,000 tonnes. Therefore, Australia's domestic market is being flooded by avocados from New Zealand as well as the increasing Australian production (majority sold on the domestic market)

**AV08046** *Real-time freight container trials to assess impact of long-term storage of Australian avocados exported to Europe*

**Project Start:** 1-May-2009

**Project Completion:** 31-Aug-2009

**Principle Investigator:** Brian Prosser, Sunfresh Marketing Co-op

**Funding source:** Matched R&D voluntary contribution

**SUMMARY**

Following earlier static trials, this confidential project aims to undertake a real time freight container trial to assess the long term storage of Australian avocados exported to Europe. Results will be publically available one year after the completion of the project.

**AV07001** *Investigation of the distribution and incidence of Avocado sunblotch viroid in Australia*

**Project Start:** 10-July-2007

**Project Completion:** 30-March-2010

**Principle Investigator:** Dr Andrew Geering, QPI&F

**Funding source:** Matching R&D Levies

**SUMMARY**

Avocado sunblotch viroid (ASBVd) is a serious constraint to avocado production in many of the major production areas of the world such as the USA.

Area-freedom from ASBVd would provide great benefits for the Australian avocado industry, especially by opening up market opportunities through the removal of quarantine barriers preventing the international trade of fruit to some countries. Official recognition of area freedom from any pathogen is guided by the International Plant Protection Convention, which states that pathogen-free status must first be established and then be maintained through a range of regulatory actions, routine monitoring and the provision of extension advice to producers.

In this project, baseline data will be provided on the distribution of ASBVd in Australia, which will form the basis of any decisions to seek area-freedom status from ASBVd, or alternatively, if ASBVd is found, provide information on its economic impact. To process the large numbers of samples arising from the surveys, it is necessary to develop high throughput testing methods utilising automated equipment, the second objective of this project.

### **AV07000** *Improving yield and quality in avocado through disease management*

**Project Start:** 02-Jul-2007

**Project Completion:** 30-Sep-2010

**Principle Investigator:** Dr Elizabeth Dann, QPI&F

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The aim of this project is to improve avocado fruit standards by optimising fruit yields, fruit quality and tree health while, in alignment with changing attitudes, reducing the use of chemicals to control diseases in orchards. Avocado fruit are downgraded or destroyed by fungal diseases causing anthracnose and stem-end rot. Root rot caused by *Phytophthora cinnamomi* constrains productivity and if not actively controlled will eventually kill an avocado tree. Of increasing concern, has been the anecdotal evidence of the spread of the brown root rot fungus, *Phellinus noxius* and little is known of its impact on the avocado industry.

It has become evident that rootstocks have significant influence on the overall health of the avocado tree so it is vital that attributes of the many rootstocks available worldwide are assessed for their superiority (and suitability) in Australian conditions. The aim is to select rootstocks with superior tolerance to root rot and, at the same time, have a positive impact on fruit yield and fruit quality. The use of phosphorous acid in avocado is essential to maintain economic yields and high quality fruit even with relatively tolerant rootstocks. Current data suggests that timing of application is critical as seasonal growth patterns can significantly influence movement of chemicals in a tree. It is important that the current application programme is evaluated and the cost effectiveness of application improved. In addition to optimising phosphorous acid application, new products such as defence activators and systemic fungicides with improved post-infection activity will be assessed for their effectiveness in disease control. The project will focus on 3 main areas:

1. Improved management of root rot caused by *Phytophthora cinnamomi*.
2. Improved management of fruit diseases such as anthracnose and stem-end rot.
3. A scoping study to determine the incidence, severity and control options of the fungus, *Phellinus noxius*.

Industry will benefit with:

1. Improved selection of root rot tolerant rootstocks suitable for Australian conditions
2. Improved fruit yields and quality
3. More efficient integrated management of root and fruit diseases
4. Improved cost effectiveness of phosphorous acid application
5. An impact study on the occurrence, incidence, economic impact and control options of *Phellinus noxius*.

### **AV08000** *Rootstock improvement for the Australian avocado industry – Phase 3*

**Project Start:** 01-Jan-2009

**Project Completion:** 01-Dec-2012

**Principle Investigator:** Dr Tony Whaley, Sunshine Horticultural Services Pty Ltd

**Funding source:** Matched R&D Levies

#### **SUMMARY**

The Australia avocado industry has continued to expand for the most part, using an ad hoc range of rootstocks selected by nurserymen for which there is no data to substantiate their performance. Despite a technically sound nursery scheme (ANVAS) to supply disease-free, true-to-type trees to industry, the development and use of superior rootstocks largely remains in limbo. 'Velvick', (predominantly West Indian race), is one local rootstock selected about 20 years ago where a body of performance data is slowly being developed both within Australia and overseas. Recent studies in Australia comparing postharvest anthracnose development of 'Hass' fruit from trees grafted to different rootstocks, have found that fruit from one line developed less disease compared with others.

During Phase 1 of this project a range of rootstocks from both Mexican and Guatemalan race populations were identified and propagated as either seedlings or vegetative clones. They were then grafted to either 'Hass' or 'Shepard' and planted out in replicated experimental blocks in the major avocado production districts of Australia (completed on 31/12/2004). The second phase of the project monitored the growth and early production of trees in the various locations where experimental sites were established. Additionally, rootstocks from the elite recovery program in Phase 1 were multiplied for field planting and evaluation with new selections recovered during Phase 2.

Phase 3 will move on to more detailed assessment of tree growth, yield and postharvest (physiology and disease characteristics) fruit performance. The project will also recover and propagate new elite rootstocks for future evaluation wherever the opportunity arises.



*Avocado R&D and marketing program overview July 2009 continued*

**AV07008** *Field evaluation of superior avocado rootstocks with ‘Hass’ and ‘Shepard’ as scions*

**Project Start:** 15-Sep-2007

**Project Completion:** 31-Dec-2010

**Principle Investigator:** Danielle Le Lagadec, QPI&F

**Funding source:** Matched R&D voluntary contribution

**SUMMARY**

Rootstocks can have a significant influence on avocado yields, tree health, growth & disease susceptibility. The Australian avocado industry is based largely on seedling ‘Velvick’ rootstock and not much research has been conducted on alternative rootstocks in Australia. Internationally, the importance of rootstock in maximizing avocado productivity is well recognized and large investments have been made over the past few decades in this field.

Some of the superior rootstocks derived from these international breeding programs have been imported into Australia by Birdwood Nursery, ANFIC, and has been established in a well randomized trial at Goodwood Plantation, Childers, Queensland. The trial, consisting of 33 rootstocks including both clonal and seedling material with ‘Hass’ and ‘Shepard’ as scion, was established in 2004. This trial has the potential to identify rootstocks superior in yield and quality to those presently used by the industry. A superior rootstock would have significant financial benefits to the avocado industry. It is therefore proposed that the effect of these rootstocks on tree performance continues to be monitored for the next three years. Thereafter, the top rootstocks could be established and evaluated in other avocado growing regions of Australia.

**MT08013** *Development of an International Standard for Mobile Elevating Work Platforms (MEWP’s) used in Orchards*

**Project Start:** 15-July-2008

**Project Completion:** 31-July-2009

**Principle Investigator:** Keith Batten and Associates

**Funding Source:** Matched R&D levies (multiple industries)

**SUMMARY**

This multi-industry project will fund the development of an international standard for Orchard Mobile Elevating Work Platforms (MEWPs) to be known as ISO16653-3 Orchard MEWPs. A considerable amount of this work has already been carried by Keith Batten & Associates, in order to remain involved in the ISO committee processes. Keith Batten has prepared technical data for detailed replies to ISO committee members Voting Results, visited New Zealand counterparts (also representative on the ISO committee) for further technical meetings, and is preparing videos for submission to the next ISO committee meeting.

This project is expected to result in the implementation of an international standard for Orchard Mobile Elevating Work Platforms that best meets the needs of the horticultural industries.

**MT08016** *Protecting pollination for the Australian horticultural industry*

**Project Start:** 01-Nov-2008

**Project Completion:** 15-Nov-2009

**Principle Investigator:** Margie Thompson

**Funding Source:** Matched R&D Levies and VC (Multiple industries)

**SUMMARY**

Horticultural crops in Australia are heavily reliant on feral European honey bees to ensure crop pollination. A real threat is posed to present honey bee populations and to horticultural industry crop pollination should the highly invasive Varroa mite (Varroa destructor) enter Australia. Australian horticultural industries are not prepared for this invasive pest. A multi industry strategy titled ‘Pollination Australia’ is proposed. The strategy will be developed to ensure industries are ready for this exotic pest and food pollination is protected and assured.

There is a very real likelihood that should Varroa mite enter this country the result would be almost total devastation of the European honeybee population and subsequent loss of pollination for a number of horticultural crops. Australian horticultural industries are currently unprepared for this pest and its impact on crop pollination. Honeybee pollination provides significant value to agricultural and horticultural crops in Australia. To the 35 most important honeybee dependent crops, pollination services are estimated to be valued at \$1.7 billion per annum (CSIRO).

**AV08020** *Evaluation of sustainable avocado orchard management practices***Project Start:** 30-Jan-2009**Project Completion:** 30-Nov-2012**Principle Investigator:** Dr John Leonardi, Avocados Australia**Funding Source:** Matched R&D Levies**SUMMARY**

There are increasing demands on growers to optimise fruit yield and quality, reduce chemical use, develop market opportunities and meet consumer expectations to remain competitive. There are a range of products and orchard management practices either being used by growers or recommended by various companies for use in avocado production, often with little scientific validation. The effectiveness of orchard management practices on fruit yield and quality need to be validated before wider industry recommendations can be made.

This project will identify sustainable orchard management practices used by growers across Australia, evaluate the effect of these strategies on tree health, fruit yield and quality and determine the cost effectiveness of these strategies compared to current industry recommendations.

**AV09009** *Information package to assist growers overcome biennial bearing***Project Start:** 29-Jan-2010**Project Completion:** 30-May-2010**Principle Investigator:** TBA**Funding source:** Matched R&D Levies**SUMMARY**

PROJECT UNDER DEVELOPMENT

This project aims to prepare an information package to assist growers manage biennial bearing.

**AV09010** *Avocado irrigation management guidelines for different phenological stages in Australian conditions***Project Start:** 1-Oct-2009**Project Completion:** 27-May-2011**Principle Investigator:** TBA**Funding source:** Matched R&D levy**SUMMARY**

PROJECT UNDER DEVELOPMENT

This project aims to develop guidelines for avocado irrigation management under Australian conditions for different phenological stages.

**AV07017** *Avocado production in the south west using reduced water supplies***Project Start:** 2-Nov-2007**Project Completion:** 1-Oct-2011**Principle Investigator:** Alec McCarthy, Department of Agriculture & Food WA**Funding Source:** Matched R&D voluntary contribution**SUMMARY**

Water use in agriculture is increasingly coming under scrutiny, this along with steady decrease in winter rainfall and pressure on water supplies is putting pressure on avocado producers to use irrigation water as efficiently as possible. A potential water saving has been identified that may enable avocado producers in the south west of WA use less irrigation water per hectare with minimal impact on fruit yield and quality.

The aim of the project is to identify and demonstrate a new irrigation schedule strategy that will enable avocado growers in the south west of WA to use less irrigation water per hectare of avocado production, with minimal impact of fruit yield and quality. In most avocado orchards of the south west, there will be trees that are in a heavy production cycle (on year trees) and those in a light production cycle (off year trees). The trees in the different production cycles use water at different levels. Traditionally, growers irrigate to minimise water stress, this means irrigating to the needs of the highest water users.

The strategy in this trial is to irrigate the orchard to the 'on year trees', these are usually the lower water users, due to reduced vegetative growth. This will require the use of suitable soil moisture monitoring equipment, with the 'irrigation monitor' trees changing from season to season to allow for the 'on off' cycling of the trees.

The outcome of the trial will be improved irrigation techniques that require reduced water inputs per hectare of avocado production. It will reduce water wastage due to over irrigating the lower water usage trees, which will reduce leaching of nutrients into the environment under these trees. It should also improve tree health in soils where water logging occurs due to the over irrigating.

Predicted water savings could benefit in several ways, reduced input cost, reduced water requirements for the current orchard area, water availability to allow for increased plantings or environmental water needs

## Avocado R&D and marketing program overview July 2009 continued

### **AV08023** *Avocado germplasm maintenance*

**Project Start:** 01-June-2009

**Project Completion:** 2-May-2011

**Principle Investigator:** TBA

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

PROJECT UNDER DEVELOPMENT

The avocado industry recognises that the declining government agency support for strategic industry resources has put at risk the continued maintenance of avocado germplasm that has been imported over the last 30 years. The maintenance of the material is an essential risk management strategy for the Australian industry. The aim of this project is to provide ongoing security for Avocado germplasm maintenance in Australia.

### **INDUSTRY MANAGEMENT**

### **AV06003** *Study Groups to Achieve Globally Competitive Avocados*

**Project Start:** 15-Dec-2006

**Project Completion:** 31-May-2010

**Principle Investigator:** Mr Simon Newett, QPI&F

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

Avocado fruit consumption must keep pace with expansion in plantings and production to keep the industry profitable. Part of the solution is to improve fruit quality to encourage repeat sales and to lower, or at least contain, the per unit production costs to keep fruit prices affordable and competitive. Addressing these must start at a grower level. Avocado production is also expanding rapidly in countries with low production costs. Imports of cheap fruit pose one of the greatest threats to the Australian industry. It is therefore essential that we improve our competitiveness for the long term viability of our industry.

Much of the technology and information to achieve better quality and productivity is already available but adoption needs to be improved. The aim of this project is to improve the productivity and fruit quality of the Australian avocado industry through better communication of technology and production knowledge.

The main strategy is to establish 10 regional study groups across Australia. Each group will identify production issues that are preventing them from raising their production and fruit quality. The study groups will serve as the vehicle for conducting regular workshops on these issues. Regular briefings will also be held for

service providers and information material will be available to all.

### **AV07012** *Australian avocado Export Efficiency Powers consultation*

**Project Start:** 1-Dec-2009

**Project Completion:** 27-Feb-2010

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

PROJECT NOT YET APPROVED

This project aims to develop a Business Case and undertake wide scale consultation with the industry and the export supply chain partners regarding the potential implementation of Export Efficiency Powers.

### **AV06002** *Improving technology uptake in the WA avocado industry*

**Project Start:** 1-November-2006

**Project Completion:** 1-May-2010

**Principle Investigator:** Mr Alec McCarthy, Dept of Agriculture, WA

**Funding source:** Matched R&D voluntary contribution

#### **SUMMARY**

The project 'Improving technology uptake in the WA avocado industry' will develop and implement enhanced communication strategies based on the demographics of the industry and run on site demonstration activities to enhance the uptake of identified improved practices for the continued development of the WA avocado industry into a sustainable, profitable and internationally competitive industry.

Low uptake of improved production and business practices generally across the WA avocado industry has been identified as an impediment to improved long term profitability. The low uptake is the result of poor communication strategies that have not taken into account the industry demographics as well as a general industry hesitation to embrace the new technology. Identified problem areas include poor irrigation and nutrition efficiency, ineffective canopy management, poor frost control and inconsistent yields.

Through improved communication strategies and increased uptake of better production and business practices, the WA avocado industry will continue to grow in a sustainable manner and remain profitable. This will be achieved through increased production; maintenance of product quality and improved efficiency, the industry will improve their competitiveness on world markets and as a result increase their market share. The progress of the WA avocado industry will aid the national avocado industry to meet its industry goals.

### **MT08010** *Prevention or preparedness?*

**Project Start:** 01-Jul-2008

**Project Completion:** 1-Jul-2009

**Principle Investigator:** Dr Ryan Wilson, Plant Health Australia

**Funding Source:** Matched R&D Levies (Multiple industries)

#### **SUMMARY**

This project aims to provide improved information on which to base decisions regarding investment in biosecurity activities for a range of horticultural industries. To assist the industry target biosecurity activities or investment, the project will undertake a Benefit-Cost Analysis using information about the industry's structure and biosecurity status (such as priority pests, market/industry structure, and phytosanitary requirements for priority pests).

A report will be produced that outlines the relative benefit/cost of potential biosecurity activities for the avocado industry. This analysis can be used as a decision making tool allowing the IAC and AAL to prioritise biosecurity investment to achieve the greatest possible benefit

### **AVo8024** *Avocado industry communication review*

**Project Start:** 6-July-2009

**Project Completion:** 1-Mar-2010

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

##### PROJECT UNDER DEVELOPMENT

This project will undertake a review of the communication systems in the Australian avocado industry. The aim is to develop a communication plan that will further improve industry communication delivery. This project will also include an industry development needs assessment that will provide direction for investment in future industry development initiatives.

### **AVo8045** *Avocado Industry Communications Strategies*

**Project Start:** 15-May-2009

**Project Completion:** 1-Mar-2011

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding source:** Matched R&D Levies

#### **SUMMARY**

Communication is absolutely essential to stay in business in today's world and it's a priority to keep a constant watch on any and every piece of information that will improve the bottom line of the avocado business. Avocados Australia provides growers with a mix of communication tools.

This project will provide all avocado growers and associated businesses with factual and timely information relating to the industry issues and their businesses. As a key performance indicator the project aims to deliver information to over 95% of the production base in Australia and that includes at a minimum of 90% of growers.

All known levy paying avocado growers will be provided the opportunity to receive the information in their preferred format. The other stakeholders would also be provided the communication package.

This project aims to ensure the continued and improved communication throughout the avocado industry. Avocados are geographically spread across Australia, with avocado growers in all states and Territories except the ACT. The overall objective is to work towards all industry members having access to similar opportunities to gain access to or contribute to industry information and to maintain a presence at international avocado meetings.

### **AVo8031** *4th Australian and New Zealand Avocado Conference 2009*

**Project Start:** 17-Jun-2009

**Project Completion:** 30-Sep-2009

**Principle Investigator:** Antony Allen, Avocados Australia

**Funding source:** Matched R&D voluntary contributions

#### **SUMMARY**

The conference is an avocado industry proven cost effective method of communication of research and development, marketing and industry issues

## Avocado R&D and marketing program overview July 2009 continued

The major benefit of the 4th Australian and New Zealand Conference will be the exchange of information throughout the industry providing clarity and a greater understanding of how the New Zealand industry and the Australian avocado industry sits within the global industry. The Conference will provide delegates with an opportunity to identify the challenges ahead and have a better understanding of issues affecting the industry now and into the future. As a consequence of presentations and workshops at the conference, the industry will have access to information which can be incorporated into business strategies and provide immediate benefits to the avocado industry. Integral to the conference program is the provision of opportunities for participants to network on a one to one basis.

The theme of the conference is "Avocados for Life". An exciting line up of speakers from the international arena, Australia and New Zealand will present the latest knowledge and understanding of important issues relevant to successful avocado production.

### **MT09038** *28th International Horticultural Congress Lisbon 2010 - industry leaders study tour*

**Project Start:** 1-July-2009

**Project Completion:** 30-Oct-2009

**Principle Investigator:** Karen Symes, HAL

**Funding source:** Matched R&D levies

#### **SUMMARY**

The 28th International Horticultural Congress will be the premier horticultural event in 2010. It provides an outstanding opportunity for delegates from all over the world to exchange ideas and build and establish important research networks. In particular it is an opportunity for industry researchers and allied professionals from Australia to interact and collaborate with and learn from their international colleagues including those from the northern hemisphere.

The congress theme is 'science and people for horticulture' focusing on science within horticulture and emphasizing the interactions of scientists with producers, consumers and all of society.

The congress includes a symposium in which the sub themes of the congress will be addressed. The sub themes include: increasing consumption of high quality fruit produced by environmentally sustainable methods; quality chain management of fresh vegetables, and emerging health issues in fruits and vegetables. Other sub themes are focused on specific industries such as olives and berries.

This multi industry project will provide support for selected industry participants to this event to provide them with the opportunity to benefit from being exposed to the world's best horticulture science and to act as ambassadors for the next congress which will be held in Brisbane in 2014.

### **AVo8025** *Avocado resource audit web database*

**Project Start:** 15-May-2009

**Project Completion:** 31-Dec-2011

**Principle Investigator:** Joanna Embry, Avocados Australia

**Funding Source:** Matched R&D Levies

#### **SUMMARY**

This project aims to develop and implement a web based database of all known avocado industry resources. Large amounts of important information are housed in various areas including Peak Industry Bodies, research organisations and other government departments. The project will develop a knowledge portal for industry stakeholders using database content developed through the Avocado Supply Chain Mapping and Resource Audit project, AVo6026.

### **AVo8001** *Environmental stock take of the avocado industry*

**Project Start:** 04-Jul-2008

**Project Completion:** 31-Jul-2009

**Principle Investigator:** Ms Jane Lovell, Tasmanian Quality Assured Inc

**Funding Source:** Matched R&D levies

#### **SUMMARY**

This project proposes to undertake an environmental audit of the Avocado industry. The major output of the audit will be a clear situation statement that can be used to promote and defend current practices as well as identifying any opportunities for improvement, thereby assisting with forward priority setting in the area of environmental performance. The results of the audit will be confidential, with individual results being amalgamated to provide an industry picture. The final report will remain the property of the Avocado industry and further distribution or dissemination of the information will be under their control.

The final report will also include recommendations regarding the ongoing use of the audit tool and provide options for verification including pathways for internal, industry and third party certification.

The work will involve consultation with industry representatives to clearly understand the needs of the industry and refine the scope

and methodology of the project. The audit tool will take the form of an online survey which will be emailed to approximately 500 avocado growers around Australia. Face to face interviews will be conducted to further investigate critical issues identified during the audit and to verify the accuracy of the information collected. The audit itself will involve a combination of assessing knowledge and practice and investigating barriers to adoption.

### **AV09003** *Unpacking emissions trading for the Australian avocado industry*

**Project Start:** 1-Sep-2009

**Project Completion:** 31-May-2010

**Principle Investigator:** Rachel Mackenzie, Growcom

**Funding source:** Matched R&D levies

#### **SUMMARY**

PROJECT NOT YET APPROVED

The commencement of an Emissions Trading Scheme (ETS) in Australia (the Carbon Pollution Reduction Scheme or CPRS) in 2010 will create new challenges for all industries in the Australian economy. Understanding the impacts and opportunities created by the ETS is vital to appropriately responding to this new policy intervention. The short timeframes and technical nature of policy development on this topic has meant that many small industry organisations have neither the resource nor the capacity to adequately understand the implications of an ETS for their industry. This is the case for industry organisations such as Avocados Australia.

The aim of this project is to assist Australian avocado growers and industry representatives understand the theory, process and implications of an ETS on the avocado industry. In achieving this, this project will review existing literature relating to the development of Australia's ETS (Carbon Pollution Reduction Scheme) and use the carbon footprinting tool Hortcarboninfo (developed by Peter Deuter from DPI&F) to estimate emissions from an avocado farm.

Key outputs will include:

- Easy to comprehend summary of the key mechanics of the proposed ETS.
- Broad summary of the role of the agricultural sector in the proposed ETS.
- Measurement of the extent of emissions and estimate of carbon sequestration per hectare in a typical avocado production system.
- Clear statement of the risks and opportunities associated with the commencement of an ETS in Australia for the avocado industry.

Key outcomes will include improved understanding of the:

- Workings of an ETS.
- Emissions from an avocado farm compared to emissions from other agricultural industries.
- Likely impact of an ETS (positive and negative) on the avocado industry and the agricultural sector as a whole.
- Likely cost increase resulting from an ETS.

### **AV09004** *Further steps in an avocado response to climate change: desktop study*

**Project Start:** 1-Oct-2009

**Project Completion:** 31-Dec-2010

**Principle Investigator:** Rachel Mackenzie, Growcom

**Funding source:** Matched R&D levies

#### **SUMMARY**

PROJECT NOT YET APPROVED

Greenhouse gas emissions have grown rapidly in the early 21st century. The balance of scientific evidence suggests that this growth has and will continue to alter the earth's climate and if left unchecked will significantly impact industries in the Australian economy such as horticulture. Responding to climate change involves adapting practices to new climatic realities and reducing emission to address the root cause of the problem.

Concern about the potential impact of climate change on horticultural industries in Australia has been growing for a number of years. Horticultural production systems have much to lose from projected increases in temperature and decreases in rainfall due to high temperature sensitivity and dependence on the availability of water for irrigation. The aim of this project is to analyse the impact of projected change on a variety of avocado fruit production regions across Australia, linking a regional analysis of climate change risks with viable adaptation strategies. This will be achieved through combining reviews of both scientific and grey literature with existing and projected climate data for avocado growing regions throughout Australia.

Key outcome of this project will include increased industry understanding of:

- Risks and opportunities associated with projected temperature increases in different avocado regions.
- Regionally specific management practices to adapt avocado production to projected temperature change.
- Regionally specific pest and disease impacts and management strategies associated with climate change and avocado production.
- Changing availability of water in different avocado regions and

Avocado R&D and marketing program overview July 2009 continued

approaches to improve water use efficiency.

**AV09015** *Avocado research capacity building*

**Project Start:** 1-Aug-2009

**Project Completion:** 1-Mar-2012

**Principle Investigator:** TBA

**Funding Source:** Matched R&D Levies

**SUMMARY**

PROJECT UNDER DEVELOPMENT

This project aims to address the shrinking capacity within the industry’s research base and the need to ensure a base research capability. It is anticipated that within five years the industry will potentially lose over 50% of its researcher based knowledge capacity.

The project will address the need to build avocado research capacity while undertaking targeted avocado research and to expand the research provider base for avocados. The strategy is to create a PhD program of avocado researchers ensuring one scholarship per year across a wide range of disciplines.

**AV08029** *Avocado program evaluation*

**Project Start:** 23-Feb-2009

**Project Completion:** 30-Sep-2009

**Principle Investigator:** Michael Clarke, AgEconPlus Pty Ltd

**Funding Source:** Matched R&D Levies

**SUMMARY**

Currently the Australian Federal Government invests \$500 million annually in agricultural R&D by leveraging industry levies and in the case of horticulture, voluntary contributions, with these investments managed through the various Rural Research and Development Corporations (RDCs). Increasingly the government has sought and impressed upon the agricultural community, the need to substantiate the return on investment to both the levy payer and the broader community.

The HAL Board is now requesting that all horticultural industries undertake a benefit cost analysis of their R&D program using the framework that has been developed through the Council of Rural RDC Chairs (CRRDCC).

This project will undertake this analysis for the avocado industry to evaluate, in quantitative terms, the net benefits from the avocado R&D program to both the levy payer and the broader community.

**AV09008** *Avocado Industry Strategic Plan*

**Project Start:** 31-Mar-2010

**Project Completion:** 1-Nov-2010

**Principle Investigator:** TBA

**Funding source:** Matched R&D levies

**SUMMARY**

PROJECT UNDER DEVELOPMENT

The current industry strategic plan was developed in 2005 and is due for renewal in 2010. This project will provide the resources to assist with the development of a new strategic plan for the avocado industry for the next five years.

**AV08900** *Partnership Agreement*

**Project Start:** 01-Jul-2008

**Project Completion:** 30-Jun-2011

**Principle Investigator:** Service agreement between Avocados Australia Ltd and Horticulture Australia Ltd

**Funding Source:** Matched R&D Levies and Marketing Levies

**SUMMARY**

This project covers a range of activities to be conducted by HAL and Avocados Australia in managing the avocado levy investments. These include: management of the Industry Advisory Committee; conduct of the Annual Levy Payers Meeting and effective consultation between Avocados Australia and HAL.



## ACROSS INDUSTRY PROGRAM

The across industry R&D program is funded through matched R&D levies and voluntary contributions. A contribution of 2% from all HAL-funded R&D projects is allocated to the across industry program to fund much needed R&D that is of benefit to all horticulture industries. Below are the projects included in the 2009-10 Across Industry program.

Further information is available from John Tyas, HAL, 07 3394 8220, [john.tyas@horticulture.com.au](mailto:john.tyas@horticulture.com.au)

Project No	Title	Project Start	Project Completion	Organisation
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### Outcome 1: Enhance the efficiency, transparency, responsiveness and integrity of the supply chain for the total industry to provide clear market signals.

MT09043	Enhancing confidence in product integrity in domestic and export markets	2009/10	2010/11	Horticulture Australia Ltd
MT07029	Managing pesticide access in horticulture	2007/08	2009/10	AgAware Consulting Pty Ltd
AH09003	Plant protection: Regulatory support and coordination	2009/10	2013/14	AKC Consulting Pty Ltd
AH09009	Food security discussion paper	2009/10	2009/10	Horticulture Australia Pty Ltd

### Outcome 2: Maximise the health benefits of horticultural products in the eyes of consumers, influencers and government

AH09023	Health and wellbeing in horticulture	2009/10	2010/11	Horticulture Australia Ltd
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### Outcome 3: Position horticulture to compete in a globalised environment

AH07003	Market access support program	2007/08	2009/10	Horticulture Australia Ltd
AH07002	HAL Market Access Coordination	2007/08	2009/10	Stephen Winter & Associates Pty Ltd
AH09012	Codex participation 2009/10	2009/10	2009/10	Horticulture Australia Ltd
AH09013	Assisting commercial platforms in horticulture	2009/10	2009/10	Horticulture Australia Ltd

### Outcome 4: Achieve long-term viability and sustainability for Australian horticulture

AH09005	Horticulture Water Initiative 2009/10	2009/10	2009/10	RMCG
AH09014	Climate Change Initiative 2009/10	2009/10	2009/10	Horticulture Australia Ltd

### Outcome 5: Other

AH09015	Contingency allocation – for key issues as they arise	2009/10	2009/10	Horticulture Australia Ltd
AH09016	Across Industry Program Annual Report	2009/10	2009/10	Horticulture Australia Ltd
AH09017	Across Industry Program Admin	2009/10	2009/10	Horticulture Australia Ltd

# Reporting on Avocado Maturity: Dry Matter percentage

Monthly reports are now available on the Avocados Australia website tracking dry matter contents for avocados from different growing regions.

The consumer research conducted last year relating to consumers' preference for high versus low maturity fruit has led the industry to revise the industry standard for DM% (as a measure of fruit maturity) at time of harvest from 21% to 23% (see page 24 of the Summer 2008 edition of Talking Avocados).

Fruit is being collected this year to monitor the maturity (as measure by DM %) of fruit being supplied by growers and packhouses. The results of this monitoring to date are illustrated below by growing region. Unlike last year there were no Hass avocados in the market in March.

Following is a summary of the results to date.

**Table 1: Proportion of Shepard Fruit collected from Sydney market that fits into specific Dry matter intervals**

Date collected Dry Matter Intervals	23/02/09		30/03/09		20/04/09	
	NQ	CQ	NQ	CQ	NQ	CQ
<=18%	2%	0%	1%	0%	0%	0%
18.1%-20.9%	14%	0%	4%	10%	20%	0%
21%-22.9%	31%	0%	9%	25%	0%	0%
23%-28%	35%	0%	44%	60%	60%	0%
27.1%-40%	18%	0%	42%	5%	20%	0%
>40%	0%	0%	0%	0%	0%	0%

**Table 2: Proportion of Hass Fruit collected from Sydney market that fits into specific Dry matter content intervals**

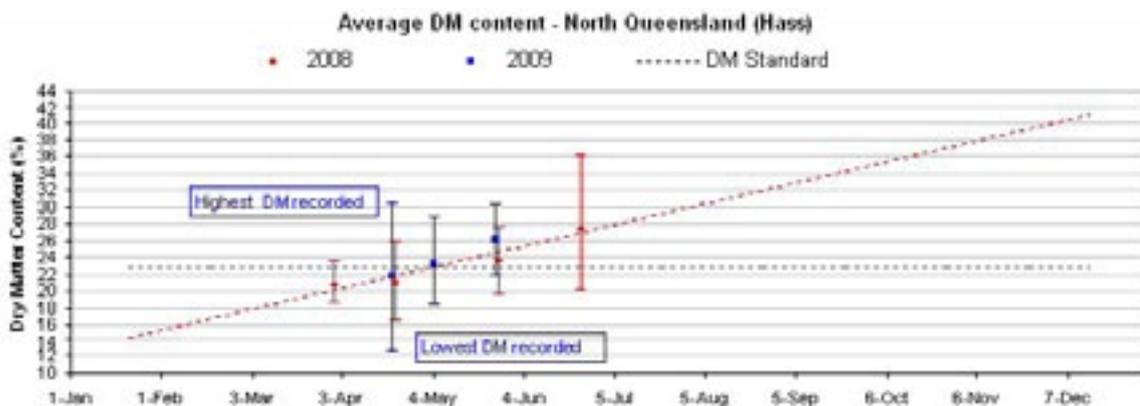
Date collected Dry Matter Intervals	20/04/09		4/05/09		25/05/09		
	NQ	CQ	NQ	CQ	NQ	CQ	SC
<=18%	5%	0%	0%	0%	0%	0%	0%
18.1%-20.9%	28%	0%	11%	30%	0%	8%	0%
21%-22.9%	40%	0%	36%	39%	6%	28%	0%
23%-28%	25%	0%	52%	31%	70%	61%	100%
27.1%-40%	2%	0%	1%	0%	24%	3%	0%
>40%	0%	0%	0%	0%	0%	0%	0%

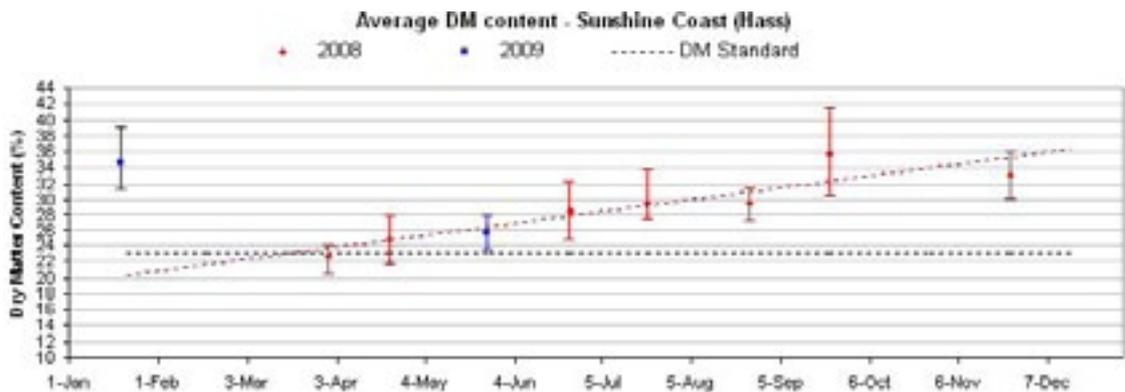
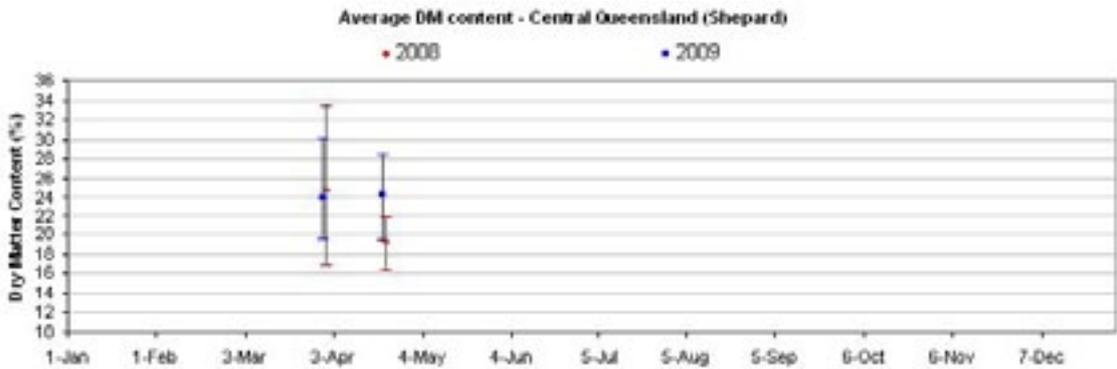
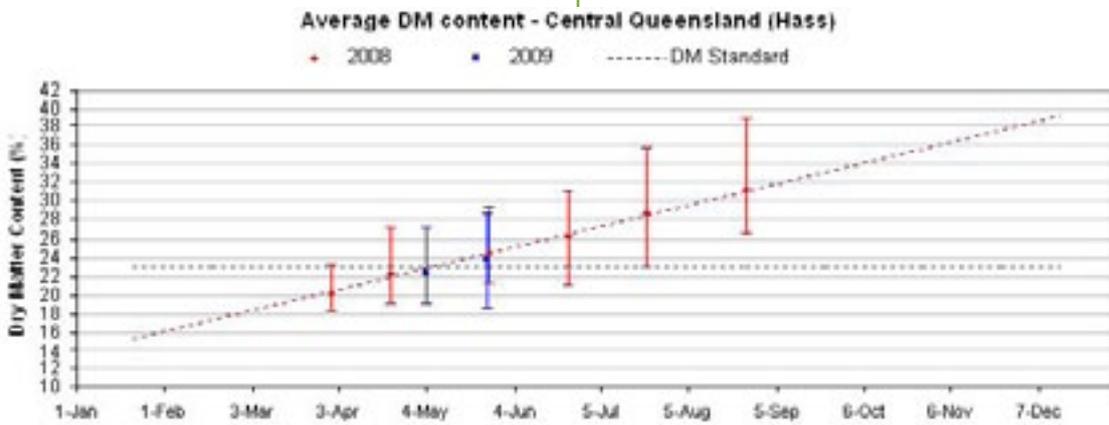
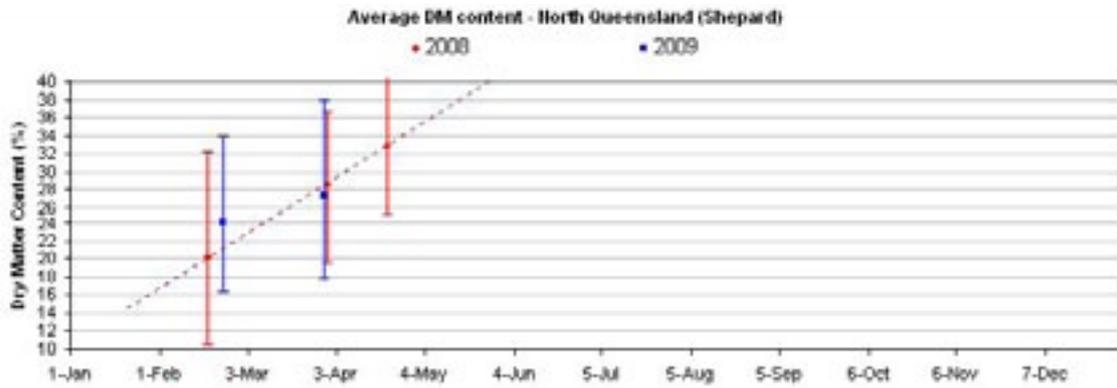
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Below 21%

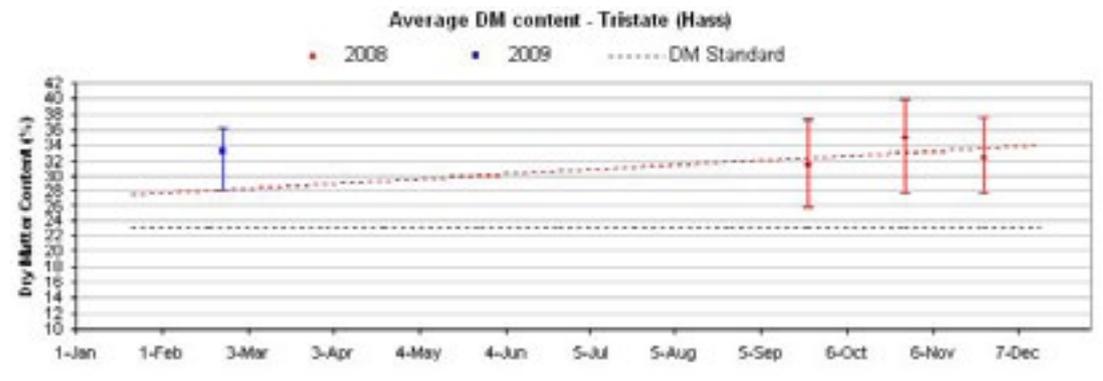
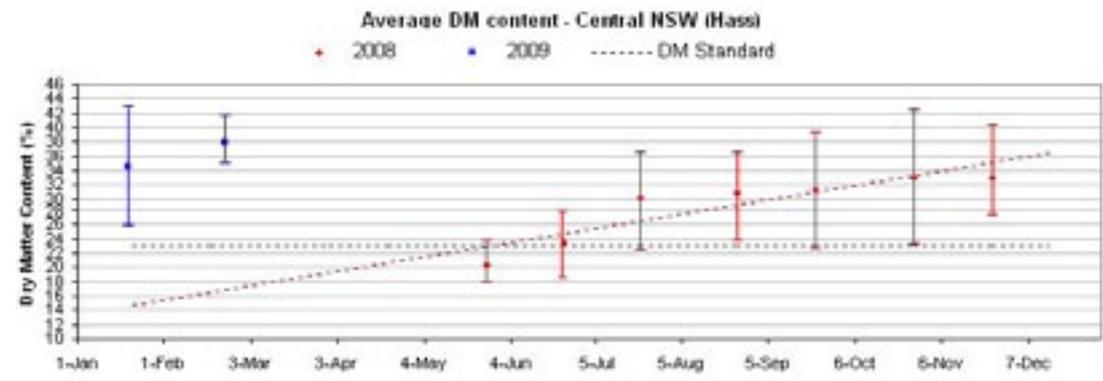
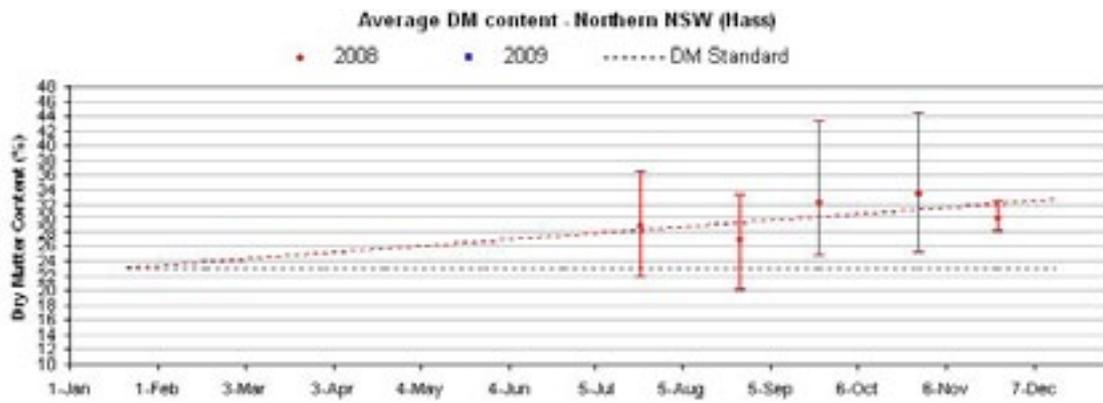
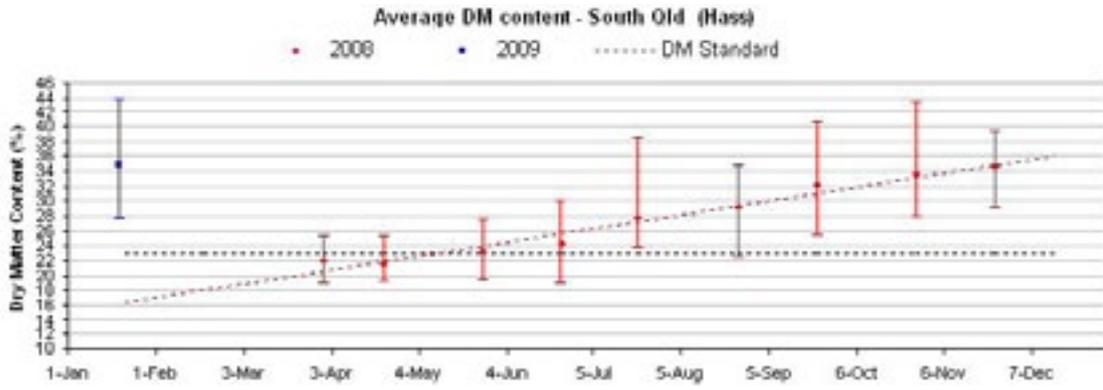
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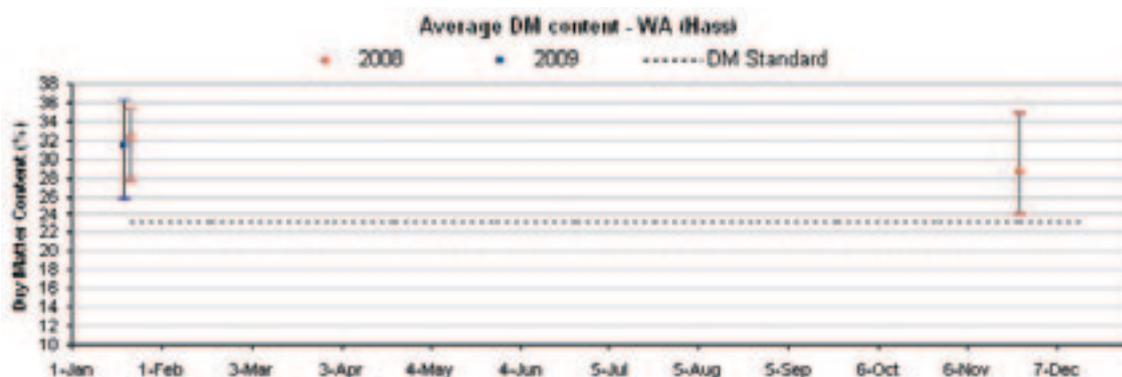
Below 23%





Reporting on Avocado Maturity: Dry Matter percentages continued





## Phytophthora damage similar to 1974

Given the large volume and length of the east coast's rainfall events over the last 4-6 months it is an important to revisit the management tools that avocado growers have to protect their trees and businesses from productivity losses caused by *Phytophthora*

By Dr Ken Pegg, Graeme Thomas & Simon Newett

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

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

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

### We are currently in the midst on one of those periods.

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



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

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

## Phytophthora damage similar to 1974 continued

These incorrect management practices include:

### 1. Making applications at the incorrect time of year.

Regardless of the manner in which phosphorous acid is applied to a tree, it moves with the sap flow to the part of the tree that is actively growing. If you apply when young fruit are actively growing, phosphorous acid will not reach the root system where it was intended for but will move instead to the fruit and remain there, giving a fruit residue level higher than the maximum residue level.

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

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

### 2. Injecting too few sites around the tree.

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

Injections should be made with 20% phosphorous acid to ensure you have enough injection sites to spread around the circumference of the tree to achieve protection for the entire root system. 40% products such as Fosject 400 should be diluted with 1 part water to 1 part Fosject 400 to give a 20% solution. 60% products such as Fosject 600 should be diluted down with 2 parts water to 1 part Fosject 600 to give a 20% solution. Always use a product that has been buffered to a pH of 7.2. Total volume injected per tree is calculated at a rate of 15 mL per metre of canopy diameter and the "shot" volume per injection site should be 20mL.

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

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

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

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

litres/ha.

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

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

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

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

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

## Suggestions to reduce the impact of damage already occurring.

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

For follow up information please contact:

Ken Pegg at QDPI on (07) 3896-9549 or  
Simon Newett at QDPI on (07) 5444-9619 or  
Graeme Thomas on 0419 977 267 or the  
Avocados Australia Office on (07) 3846 6566

(please note Fosject is used as an example product only, it is no longer commercially available so please substitute your preferred brand name product when working through this sheet)



## Grower Member Application Form continued

### Payment Options

Grower Membership of Avocados Australia is \$143 pa (including GST). You can pay your membership by cheque or credit card. To pay your membership fee, please choose one of the following options:

**Cheque**

Please find enclosed a cheque for \$143.00 made payable to Avocados Australia Ltd.

Please charge \$143.00 to my credit card. Details are listed below.

**Credit card** (please circle):

MasterCard    Visa

Credit card number:

Name on credit card:

Expiry date:

Signature:

### Privacy Options

Avocados Australia Ltd adheres to privacy rules with respect to the way we collect, use, secure and disclose personal information. Please indicate below (tick) if you do not wish to receive additional information.

I do **not** give Avocados Australia Ltd permission to allow my postal contact details to be accessed by other organisations other than Avocados Australia Ltd which offer beneficial products and services.

•NB - No personal details other than name and postal address will be given out under any circumstances.

Once you have completed this form please place it in an envelope addressed to:

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**Reply Paid 8005**  
**Woolloongabba Qld 4102**

(no stamp required within Australia):  
For more information or assistance please go to  
[www.avocado.org.au](http://www.avocado.org.au) or call on **07 3846 6566**



## News from Around the World continued

normal (those who were less affected by frost or coastal crops in the highlands).

It is noteworthy to mention that some sectors of the Ligua and Cabildo again this year faced serious problems of water supply, a situation that would have limited its potential.

In the Metropolitan area should see the greatest increase in production. Frost in 2007 would have affected most of the avocado orchards, resulting in two seasons with minimal levels of production.

In this way, the volumes projected for this season would be significant and largely correspond to a recovery of normal production levels. It should be mentioned also that the expression of production potential, expected this year, was favored by good temperatures recorded at the time of setting.

Another factor to be highlighted this season, are particularly high temperatures during the fall in the main producing areas, especially in the RM. In areas where there were no water restrictions, the favorable weather would have encouraged a high metabolic activity, capable of sustaining an excellent development, both tree and fruit, significantly improving the distribution of sizes, despite the high load. Indeed, one factor that drew the attention this fall was the natural fall of fruits, but not by the amount of the fruit drop itself but by their size.

### Domestic Market

The low level of supply of last season has allowed domestic market prices to remain quite high. This has generated great expectations regarding the early fruit. Traders are offering high prices, creating what would be quite high expectations for this season.

### Start of Season

According to analysis carried out in dry matter of the different fruit orchards, it has been commented that the oil levels would reach, on average, very similar levels to those of previous years, making it advisable to start exporting in July. Moreover, considering the domestic price is still quite high, the alternative of early exporting is very unattractive, at least until the market price in the domestic market levels with United States.

Considering the above, hopefully the season will start with regular shipments, and then as they start harvesting the south central area, volumes would increase significantly, particularly expected to be kept high until the end of the season, this is until late April or early May of 2010.

### Export Market

This season is projected that avocado production volume will be near 240 million pounds. If we consider that the percentage of fruit that has historically been in the market, ranging from 35% (in years of low production) and 23% (years of high volumes) are projected to total close to 180 million kilos in exports for the

season 2009-2010.

U.S. receives about 73% of this volume, which would mean the new season will be nearly 131 million kilos, this is 138% more than the previous season. Europe meanwhile, would receive about 41 million kilos (23% of export volume), a volume that is 156% higher than during 2008-09.

It is important to note that the figures presented in this analysis correspond to the productive potential this season. These figures could be subject to change, because they still must go through the winter period that if they submit to very adverse conditions, could significantly change the current projection. Source: Committee de Palta Hass



## NZ: Avocado growers hope co-operative will lift returns

Avocado growers are banking on a new marketing co-operative to cut costs and lift returns. New Zealand Avocado Marketing Ltd has more than 20 large growers signed up as shareholders and is about to issue a prospectus to attract some of the smaller orchardists.

Acting managing director Mark Yortt says costs are increasing for avocado growers, prices are falling because of oversupply, and growers are paying commissions of up to 10% on the value of export-ready fruit. He says the co-operative hopes to address the need for growers to have more control, to address the margins and to integrate a high-pressure processing facility.

Mr Yortt says in years of high production growers are not getting an economic return from fruit sold in New Zealand. The co-operative is aiming to sell between 400,000 and 500,000 trays in its first year, or about 10% of the national crop, and will start shipping avocados to North America in July. He says there are also plans to process halved and sliced fruit for export. Source: Radio NZ

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