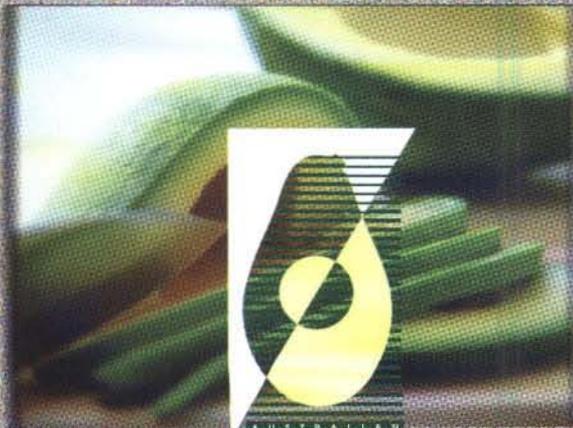
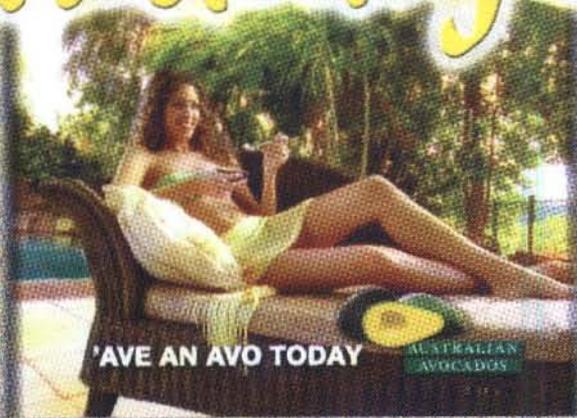


# Talking Avocados



AUSTRALIAN  
AVOCADO  
GROWERS'  
FEDERATION INC.

WINTER 2003 ISSUE

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## TALKING AVOCADOS

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**We all make mistakes:** If we make a mistake please let us know so a correction may be made in the next issue.

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# President's Perspective



## International Cooperation

We recently had a visit from Dr Stefan Köhne the Manager: Research and Development for Merensky Technological Services in South Africa. Stefan and his team conduct research on avocado and mango production for Westfalia Estates and the SA industry.

Areas of research include cultivar and rootstock development, agronomic aspects including the use of plant growth regulators, fruit physiology and plant pathology including alternative chemical controls for pre and post harvest diseases and new biological control agents. He also manages a large commercial avocado nursery which is a major supplier of cloned trees to the SA industry.

The AAGF organised a series of meetings for Stefan with avocado researchers in Qld and he also visited a number of orchards in SE Qld and Nth NSW. The visit followed our visit to Westfalia Estates in February when we invited Stefan to visit Australia with a view to building linkages between his researchers and the various research groups in Australia.

The AAGF was recently approached by the NZ industry seeking access to our current avocado TV commercial for use on NZ television. An agreement is currently being finalized which will give the Australian industry a financial return for its development of the advertisement and the NZ industry will be able to promote avocados on their domestic market without having the significant cost of development of an ad. There is also interest from South Africa in utilizing our advertisement in their programmes.

## Marketing

With the season now well under way, I continue to be concerned by a number of aspects of our selling (sorry, should be marketing) system.

### 1. Lack of communication.

As an industry we continue to "dump" large consignments of fruit, (often on a single market) on the wholesale market system with little apparent communication between the packers or with the wholesalers. We expect that the "markets" will move that fruit at a price similar to the previous week, when it was dispatched.

What often happens is that the other wholesalers/traders buy the fruit (at a discount) and ship it to other markets to even out the supply/demand situation. Unfortunately the returns to all growers have been reduced due to the discounting while the traders have all made their profits.

I am not aware of any prizes currently on offer for the grower/packer who places the largest consignment in a market each year, but maybe I should introduce it – "Dumb Marketer of the Year" would seem appropriate.

The wholesalers have a well-developed communication system amongst themselves while many growers/packers continue to funnel all their communication through their wholesaler. Improved communication at grower/packhouse level should enable the industry to better manage the flow of fruit through the system.

As an industry we need to reduce our reliance on the wholesalers coldrooms to manage the flow of fruit, as the quality of fruit is not improved and profits are not "harvested" by the growing sector.

### 2. Retail Margins.

Recently, good quality avocados have been priced at \$1.95 each at retail level. Given that this fruit was size 23 and was being sold when the top wholesale price being quoted was \$18/tray, there appeared to be a significant retail margin being achieved.

While the industry does not want to again see the specials of 3 for \$2 at retail level, as no one makes a profit at that price, in periods of strong supply, the retail price should more accurately reflect the cost of goods sold. Thus the consumer would gain the benefit of the supply/demand situation and we should all see an increase in consumption associated with lower retail prices.

### 3. Fruit age.

The quality of fruit at retail level for the last two seasons has, in general, been good. The fact that fruit has been moving through the system has meant that fruit age has not been a serious issue.

This season, with increased supplies during the winter months, we have a real risk that fruit age will again become an issue and the fastest way to slow consumer demand is to present "old" fruit, with all its associated problems.

Let's hope that all sectors of our industry can try and manage this issue and if you are aware of "old" fruit being presented please bring the problem to the attention of management.

*By Rod Dalton*



L-R: Graham Anderson & Dr Stefan Köhne

## From Your Federation

By Antony Allen

### Levies, what are they good for!

#### Federal R&D and Marketing Levies

Levies come in all shapes and sizes. There are levies and charges at a number of levels in horticultural industries. Some are voluntary and you as a grower can choose whether to pay or not. The other is a statutory levy, one that is set down in legislation and is compulsory. This type of levy can be collected by either the State or Federal governments on behalf of a horticultural industry.

#### Federal or National Levies

The Federal levy system was developed and refined in the late eighties. Each industry is able to levy itself for R&D and Marketing on its own produce. Avocados were one of those industries that saw the early benefit of a R&D levy. This was closely followed in the early nineties with a Marketing levy for avocados.

The Federal government, to encourage industries to implement self levying agreed to match collected R&D levies dollar for dollar with a maximum Government contribution not to exceed 0.5% of GVP (Gross Value of Production). Marketing levies are not matched. This system continues to this day.

Currently the avocado industry has levies set at 8 cents per tray for R&D and 15 cents per tray for Marketing. This system is managed through an Act of the Federal Parliament and with this comes responsibilities and government red tape.

How does AAGF the peak industry body (PIB) utilise these funds for the industry? This is carried out through the R&D and Marketing Committees of AAGF. These Committees consider and select projects that best serve the strategic goals of the avocado industry with the limited levy funds available. Each project is then administered on behalf of the avocado industry by Horticulture Australia Limited (HAL).

HAL is a company limited by guarantee that is owned by all the horticultural industries that have a Federal levy. HAL has the role of service provider to each of these industries. It administers the levies and the projects that are funded through the levies on behalf of the industries.

#### How can they be used?

Levies are not a big pot of money to be spent as the AAGF wants. There are strict rules and processes on how, when and what they can be spent on. The levies are collected for the purpose of R&D and Marketing. This includes the administration, development and promotion of these areas.

Your levies cannot be used for any "agripolitical" activities whatsoever. Any person, publication or event that is funded through any levy cannot undertake any "agripolitical" activities. This fact is not widely understood. So any issue that may challenge the Federal government's policy position must be undertaken by the AAGF President and Board with no support from the Secretariat or its personnel.

If you have any questions regarding your avocado levies please call 07 3213 2477 or email [a.allen@aagf.org.au](mailto:a.allen@aagf.org.au)

#### AAGF Avocado R&D Roadshow 2003

As previously mentioned the Roadshow is coming to you in the second half of 2003. We have put together an exciting and information packed day for all of you. By the time you read this issue of Talking Avocados the Atherton Tablelands Roadshow Day will have taken place and Bundaberg/Childers will be very close. Please read the information on **Page 27** and fill out and return the registration form that is the pink insert. We all look forward to seeing as many of you as possible.

The Roadshow will visit seven areas across the country. The regions and dates are below.

- |                             |                  |
|-----------------------------|------------------|
| 1. Atherton Tablelands Qld  | 3 July 2003      |
| 2. Bundaberg/Childers Qld   | 24 July 2003     |
| 3. Gatton SE Qld            | 29 July 2003     |
| 4. Duranbah Tweed River NSW | 1 August 2003    |
| 5. Yarrahappini NSW         | 14 August 2003   |
| 6. Renmark SA               | 25 November 2003 |
| 7. Pemberton WA             | 27 November 2003 |

It will be an on farm, one day event, making it easier to break away from the orchard jobs, to be updated on the latest outcomes from the Avocado R&D Program and local issues. Attendance will be free of charge.

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# AUSTRALIAN ROUNDUP...

## Atherton Tablelands

The Shepard season for 2003 is over with the production very disappointing. Productivity has not kept up with planting rate increases and production estimates. Clearly seasonality has had a large impact.

The Department of Natural Resources and Mines has implemented a 50% reduction in water usage from 1<sup>st</sup> May 2003, affecting all of the users of the Atherton sub-artesian area. This restriction is for one year and unless we receive substantial rain will be extended.

The concern for avocado growers is that the current draw down is in excess of the refill existing at this moment. Another concern is that very few of the one hundred and seventy license holders in this area have water meters fitted. Those growers who have seen fit to fit water meters and install control-monitoring systems are being penalised by those who continually use far in excess of their license allocation.

I attended a meeting in Atherton with the DNR & Mines and put this point forward only to receive a response, "that it would take 15 months to bring forward standards on selection and fitment of meters to allow monitoring of all license holders" – a point I suggested was a joke as this is not rocket science.

Hass fruit from the district was in the markets in the first week of April. Hopefully growers are ensuring the maturity was up to standard and that because of the shortage of Shepard, this was not an opportunistic approach to be picking early for the sake of the almighty dollars.

*Col Cummings*

## New South Wales

Many NSW growers are watching the market as their season is due to commence. Early varieties have already started, and the Hass crop is ready in the warmer areas. Some welcome rain has arrived on the coast, but we are still behind in terms of water storage in many areas. It has been very mild weather so far, and we are hoping for a mild winter.

The NSW association's trip to South Australia in April was a great success. I would especially like to thank John Dirou (NSW Ag) for his assistance, and the SA growers for their hospitality. A separate report on the trip is in this edition. All who travelled had a very rewarding trip, and any future excursions are sure to be popular.

At the NSW AGM held on 20th March at Alstonville, the re-elected executive was:

**President:** Chris Nelson

**Secretary/Treasurer:** Alison Tolson

**Committee Members:** Geoff Betts, Tony Lawrence, Ian Tolson, Peter Molenaar.

John Dirou provided a very informative talk on his nutrient replacement work on avocados. The meeting was also addressed by Antony, who explained the imminent restructure of the AAGF to a company.

There was some discussion of the dangers of this proposal and then a motion from the floor requesting a review of the structure options and a 'go slow' on any further spending.

The next major event for the year will be the AAGF Roadshow, due to arrive in August, so look out for the date at your nearest venue. This will be an excellent opportunity to meet with your industry reps and experts.

Cheers, *Chris Nelson*

## South Australia

On May 14<sup>th</sup> the AGM of the SA Avocado Growers' Association was held at the Berri Hotel. As the Road Show is coming in November, we held the AGM in the afternoon to handle the formalities.

Business discussed at the meeting were:

**The Royal Adelaide Show** - any changes to the format and how to make a profit from it. We thought that we have a good formula, which works well. To make a profit the growers will donate a day to work there and also put our prices up a bit.

**The proposal to have the AAGF become a Company Limited by Guarantee** - This provided a good discussion with a lot of questions. Generally the feeling of the meeting was positive about the new set up.

**Retirement of Kevin Heritage** - A long-standing member of the committee, Kevin Heritage did not wish to continue as he is retiring from avocado growing. Kevin has been an active member of the association since its inception and has been on the committee for a long time (at least 15 years).

The cut in water usage by 20% for this coming year is causing a lot of headaches for growers in SA. Growers here are very efficient in their use of water with their irrigation practice, and now we will be hit with a 20% cut. Growers are considering how they will be able to manage it and still end up with good crop next year.

*Col Fechner*

## Survey Winner

The AAGF recently conducted a Survey of Talking Avocados readers. The first 300 forms received went into a DRAW for a copy of Dr Tony Whiley's book –

***The Avocado: Botany, Production and Uses***

CABI Publishing 2002

Valued at over \$200

**The WINNER of the DRAW was**

**L A & J A Ferns of Halls Head – WA**

*The AAGF expresses its appreciation to the readership for their overwhelming response to the SURVEY.*

*Thank You*

# Avocados on the Murray – A Grower Tour

By John Dirou – NSW Agriculture, Alstonville

Grapes and more grapes, citrus and more citrus. This was the view from my bus window as I travelled through the Riverland of South Australia and the Sunraysia district in Victoria. However, I was with a group of 25 avocado growers from NSW on a study tour of the Murray avocado growing areas.

We did find avocado trees and local growers only too willing to talk to us about their local growing conditions, tree management practices, fruit marketing, while we walked through their orchards looking at their trees.

Recent Australian Bureau of Statistics figures show that South Australia has 60 growers with 54,000 trees producing 1110 tonnes. Victoria has 110 growers with 69,000 trees producing 1160 tonnes.

Growing avocados in this area is so very different to that experienced on the mid and far north coast of NSW. Can you imagine not having to spray? That is right – no pesticide usage. What a saving in time and money.

I found it hard to believe there is no anthracnose disease or fruit spotting bug, just to mention two of our problems. Phytophthora root rot, a debilitating disease on the NSW north coast, is also not a problem on their deep sandy soils.

With a 200 mm per annum rainfall, growing avocados in this area is only possible with irrigation where up to 15 ML per hectare per year can be applied. This is equivalent to 1500 mm of rain.

Irrigation water was priced up to \$120 per ML. Murray River water could be purchased under licence in one area for \$1100 per ML. In another area, growers do not have to even worry about their irrigation as a water bailiff turns the water on and off according to an agreed roster.

In this environment monitoring tree water usage is vital. Many systems are being used including Enviroscan, Diviners and Gophers. The pH of irrigation water is around 7.9.

One very interesting system being used was developed by Spaniard Rafael Martinez. It is an open hydroponic system that supplies trees with an electrochemically balanced nutrient solution on a daily basis according to the phenological development stage of the tree. Irrigation is supplied by micro-drippers during the hottest part of the day. This makes evaporative cooling more effective.

With large irrigation schemes you invariably have a problem with the build up of salt. An interesting visit was made to the Woolpunda and Waikerie Salt Inception Scheme at Stockland Plain. Established in 1990 this scheme was designed to lower the river salinity levels further downstream. It consists of a network of 66 bores located north and south of the River that pump underground water at a rate of 340 litres per second from a depth of 75 to 125 metres. This water has an Electrical Conductivity of 25,000, about half of sea water. This waste water then either evaporates or soaks into the soil profile. It will take more than 100 years for this water to filter back to the Murray River.

New plantings are mainly Hass with some Reed. Zutano rootstock is used predominately. We were told it is more tolerant to saline water, the cool winter temperatures and the limestone derived soils with a pH up to 7.8.

Frosts in winter are a real concern. We saw wind machines in vineyards. One avocado grower indicated he is seriously considering the economics of installing this technology. Another grower uses overhead sprinklers, one per tree. This system is also used to combat the high summer temperatures that can reach the mid-forty degree Celsius.

Of late, more attention is being paid to canopy management and the use of mechanical hedging. We saw unpruned 13 metre trees, they let little light onto the orchard floor. Since there is no need to drive spray machines through the trees many blocks have never been pruned.

One of the concerns associated with hedging is its timing, as trees are always carrying fruit – two crops for several months of the year. Sacrificing fruit by pruning it off is a big ask, especially when you calculate its value on the high priced market from Christmas through to March.

This study tour would not have been possible without the cooperative, friendly and welcoming attitude of the Riverland and Sunraysia avocado growers. Special thanks goes to NSW Avocado Growers' Secretary, Alison Tolson and South Australian Col Fechner for their organisational efforts. Our study tour was planned by AgTour Australia and was partly funded by FarmBis.

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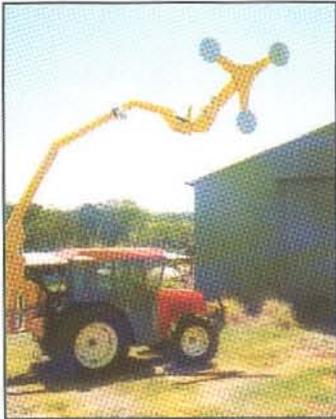
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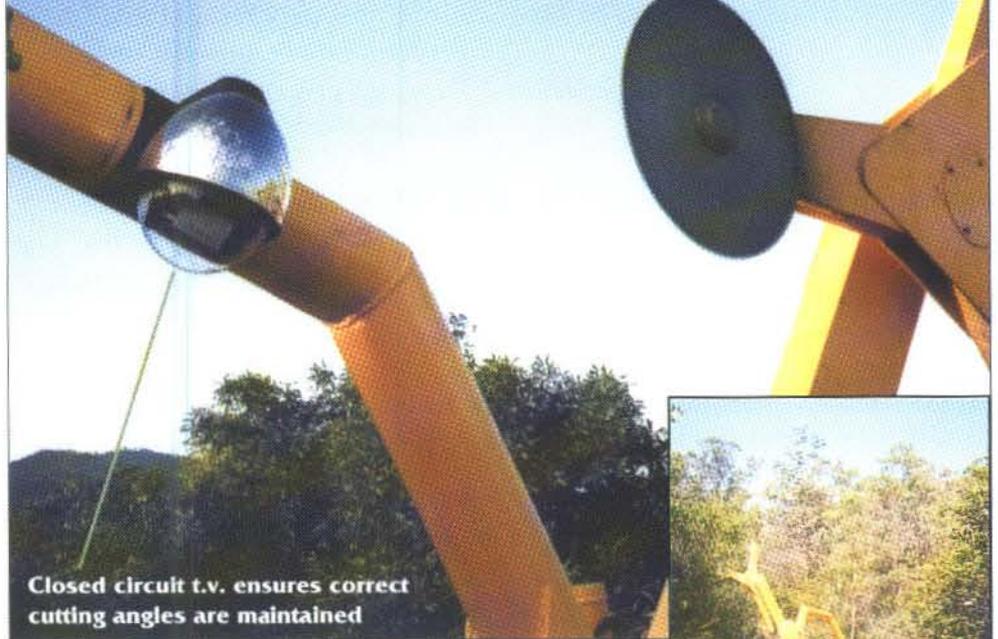
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**Photo 1:** Stuart Point growers Sue and Chris Nelson, Alison and Ian Tolson. Chris is President of NSW Avocado Growers Association and Alison is Secretary/Treasurer.



**Photo 2:** Waikerie grower Greg Leibig explaining his canopy management practices to the NSW growers.



**Photo 3:** Geoff Betts from Halfway Creek takes a close look at a Lamb Hass fruit.

# Developing a Crop Prediction System for the Australian Avocado Industry

*A Study conducted by Marie Piccone, Piccone PHC and Rod Woolcock, GRM International for Horticulture Australia Ltd*

*This study was conducted during the period July to December, 2002 and was funded by matched industry levy funds.*

The Australian Avocado industry has expanded its production and marketing activities significantly over the last 20 years. Currently there is no formal, industry initiated system to predict crop volume in the short or longer term. The purpose of this project was to investigate the feasibility and potential of developing a crop prediction system for the Australian avocado industry. The desire is to be able to estimate the size of the crop at an orchard, regional and national level. The project has entailed review of existing systems in avocados and other industries within Australia and relevant production regions and countries globally. The decision making process has been strongly underpinned by a Crop Forecasting Steering Group consisting of AAGF, Horticulture Australia and the appointed project consultants.

## Priority Objectives

Widespread industry consultation to determine the priority objectives of the project and the existing knowledge and techniques has been integral in the project. Based on industry research and current international trends, the following objectives were defined as priority objectives for a potential forecasting system:

- To develop a statistical industry database to be used for estimating and forecasting
- To know the volume of the avocado crop by region
- Achieve an accuracy of 10 to 20 percent variation between estimated and actual
- Provide final opening season estimates (this would be the end of January or early February) and a mechanism to adjust due to seasonal conditions at designated intervals
- Estimate the percentage of "fruit sizes" determined and reported by region
- Provide information that will enable better supply chain management

## Taking a Step Forward...

The Australian avocado industry is fortunate to have a number of precedents to be able to use in developing a customised system to suit current and future needs. The precedent overseas and in Australia is that the development of these systems has not eroded prices, industry relationships or industry development.

In contrast, the opinion of key players that were contacted was that it assists in stabilising returns and pricing, reduces the likelihood of supply instability, allows better marketing and supply chain management and relationships. The

operational benefits are also cited as significant and financially beneficial.

## Options Being Considered

In view of the Australian avocado industry profile, the stated priority objectives, feedback from industry, three possible options were recommended for consideration by the AAGF.

### OPTION A

- Provide information on estimates of the variation in the estimated crop volume (further detail could also be incorporated) in comparison to last year's actual production. The process would involve using volunteer participants/orchards in each of the regions throughout Australia. These volunteers would be "trained" on the various methods that are available for field estimation and the training could be funded via the state FarmBis programmes (75% subsidy for marketing, supply chain management, and financial/business management training programmes).
- Training delivered jointly by local extension officers, crop estimation experts (eg Steve Pierce), local producers who have had known success with their techniques and experienced consultants. Information from volunteer orchards collected and analysed by AAGF representative/s or companies invited to tender to manage the process.
- Expenditure on training and coordination would be in the range of \$2000 to \$4000 per regional training session (depending on the trainers involved and their associated travel expenses etc). Using partial FarmBis funding (available until June 30 2004) this would equate to \$500 to \$1000 per training session. A more accurate estimate of the total cost would be feasible once the locations of training activities and the trainers were decided. The national cost of collecting, collating and communicating the information would probably be in the vicinity of 10–20 days per year (approximate cost \$5000 - \$10000).
- This option does not necessarily require the development of a statistical database to be effective. However, it is debatable as to how useful it would be and whether it would meet the priority objectives and desired outcomes of various industry sectors.
- Developing a more in-depth skill base on crop estimation techniques amongst the avocado grower base and key industry providers and "field testing" the various techniques would be of great value especially if the system was developed further in the future.

**OPTION A would provide basic information on the relative size of the crop and the variance from last year's crop. It would also provide a base for packhouses and individual growers to develop expertise and systems in crop estimating.**

## **OPTION B**

- Utilise most elements of the California ACE system - the California Avocado Crop Estimation System is explained below - (excluding the aerial surveys at this stage) customised to suit the Australian industry including an industry survey technique similar to the 'mail out' used currently by the Australian Citrus Industry and the Californian Avocado Commission. The better orchard estimation techniques that have been identified could still be "field tested" within this system.
- If this relatively accurate system was to be adopted then it would be wise to study it closely on-site and hopefully develop a relationship with the Californians so that open access to their techniques and maybe even cost effective access to their computer model etc would be achieved.
- Training regarding field estimation techniques would still be included as in *OPTION A*. The AAGF could utilise a range of resources to deliver the system. It could be administered by AAGF and a sub-committee in much the same way as the R&D programme is administered and structured. The implementation could be put to tender or key personnel could be directly employed by AAGF to perform the role/s. In other Australian horticultural industries, Industry Development Officers located in production areas often perform the training, data collection or auditing involved in the system. The delivery options for this system are numerous and a cost-effective method could be found.
- A budget of \$220 000 to develop the system over 24 months would be feasible i.e. \$110 000 per annum. This budget is derived from assuming the employment of a full time development officer or contracting to an industry service provider or company to develop the industry statistical database, conduct industry training, collate and deliver information and coordinate an industry wide extension/public relations programme.
- The option of using an industry service provider would provide the opportunity to utilise a range of skills across a group of people to achieve the desired outcomes. There are a number of organizations both government and private that would be amenable to taking on such a project.
- The cost of the project could be shared if it was put forward to Horticulture Australia and FarmBis as an avocado industry project. The ongoing maintenance of the programme is 'estimated' to be half of the development phase based on comments from the Californians and other figures on time commitments that the consultants have gathered mainly from the Australian citrus case study.

- This option has the potential to deliver the priority objectives outlined by the Steering group. It provides for industry involvement and can utilise other funding sources available to industry. It is based on the key component of having a competent person or organization to meet the objectives in the desired timeframe. Involvement of an AAGF sub-committee leading the planning, monitoring and review process should maintain strong industry involvement, performance of the provider and strategic direction.

**OPTION B is capable of delivering a system that can grow with the Australian industry and prove that substantial benefits are achievable. It can provide the data required for a dynamic crop prediction system.**

## **The California ACE System**

The Avocado Crop Estimation (ACE) system in California was first developed by Avi Crane and has been used since 1985. In essence the system involves a crop survey of growers of California avocados twice a year. A field officer checks on any anomalies and checks the situation in each district throughout the year.

A crop estimation team including the field officer, the team leader, a statistician and a computer programmer meet several times during the year to discuss the data and reach consensus on the numbers prior to general release to the industry. An accurate inventory of California acreage is essential to obtain an accurate state wide projection from sample groves. Annual acreage surveys are conducted to maintain an accurate inventory of the state's avocado acreage. An aerial survey of all avocado production areas in the state is conducted once every 4 years as an additional measure to determine acreage.

45 to 50% of growers participate in the grower survey that is done twice a year (initially it was done three times per annum). The initial survey is mailed out in autumn. Growers are requested to estimate total production by variety and to verify acreage details. This information is processed and compiled. As surveys are returned by growers the information is compared with neighbours, with historical data and with the field officer's assessments at nearby sites if necessary. Any abnormalities or peculiarities in the data are checked personally by the field officer. The current field officer is very experienced and is reputed to be highly skilled and accurate in his methods of estimation in avocado groves.

Ground tramping done by the Field Officer is a vital part of the system. Field surveys are done by the field officer on a random basis after fruit set in each region of the state. In March every year a second grower survey is done.

After each survey, the data is inputted into a customised computer programme and a projection by area is generated. The model used in the programme has been further developed since Avi Crane first developed it in 1985. One of the main issues with the technique is that adjustments need to be made

in the event of fruit being dropped due to a “high wind event” or some other natural disaster. This is done by the Crop Estimate team at the California Avocado Commission (CAC) and is based on some field damage assessments of the losses.

The Crop Estimates Committee meets regularly to review the process. They compare current fruit movements with the historical database. They evaluate data from handlers and packhouses to look at crop movements and actual throughput in relation to the estimates for the same timeframe. This process is continuous as the California industry harvests 12 months of the year. The season is officially from 1 November to 30 October in the following year. The estimates are reported to the CAC Board in October then released as the Opening Season Estimate for the coming 12 months. An update to this is only made if there is a significant change or revision required to the Opening Season Estimate.

In terms of accuracy, the aim is to be within plus or minus 5% of the actual crop volume. Generally, the difference between the actual volume and the estimate has been 0 to 3% since the early 1990s with only 2 exceptions.

The Opening Season Estimate and other information is available on the CAC website – [www.avocado.org](http://www.avocado.org) within the grower section.

### OPTION C

- Instead of using individual grower volunteers, packhouses, large individuals, local associations or marketing groups could be used to gain the representative indication of the situation in each region in conjunction with the industry statistical census technique. This would be similar to the California ACE system except that the packhouses and the marketing groups form the point of contact and as such share in the administrative roles and system development and maintenance.
- Central packhouses, local associations, individuals or marketing groups would “host” and “fund” the training sessions and the collection and provision of data to AAGF for further analysis and communication. The AAGF would still need to conduct and administer the industry statistical census.
- The cost of the development would be similar to *option b* but the on-going costs of maintenance and continuous development would be partly met by the participating businesses or groups due to the use of their internal resources in many aspects of collecting and forwarding data (as is the case in New Zealand). However, a resource would still be required to manage the process nationally.

**The strong outcome of *OPTION C* would be a base of knowledge and ownership in the marketing and packing companies as well as with the individual growers and industry organizations. This option is also able to provide the priority outcomes desired by the Steering Group and the vast majority of those listed by the industry stakeholders.**

### An Industry Investing in its future?

Industry direction and investment are dependent on the consensus of the industry and the ultimate decisions of the AAGF. One of the key issues is the decision of whether or not to proceed based on the investment involved. Other industries that have formal systems have invariably stated that the benefits and advantages are immeasurable and substantial especially in the areas of marketing, strategic planning, promotion programmes, logistical management and business planning. The financial investment by each industry does vary considerably.

The success of any crop prediction system will depend on the management, accessibility and utilisation of the information and trends provided. Many operators around the world and within Australia would argue that such a system is fundamental to a successful, professional and strategic industry that has a sound basis for strategic financial, marketing and industry planning into the future.

At this point in time the AAGF, due to the large cost of implementing any of the options proposed, is not recommending proceeding with any of options set out in the above report. AAGF will continue to look into systems that may serve the industry in a more cost effective way.

## Avocado R&D Road Show 2003

Presented By The  
**Australian Avocado Growers Federation Inc**  
In Conjunction With  
**Your Local Grower Organisation**

**Schedule and Venue:** Are as set out on the pink insert in this issue of Talking Avocados.

**Date:** Check your closest “Road Show Day” for its date

**Start Time:** 8:30 am

The “Road Show” offers to all growers the opportunity to learn, inspect and discuss various horticultural techniques and technologies in practice, as well as the opportunity to examine many current research sites to see some of the alternative strategies being investigated by researchers. It is an opportunity to discuss the interpretation and implementation of research outcomes at a regional level and to see current on farm research and practical applications of previous research in the growers own growing region.

Have direct access to all these experts and the AAGF team to extract the information you need to work smarter, improve your productivity and increase your bottom line. The day is all inclusive, R&D Experts, Industry Leadership, food and drinks will be supplied.

**Fill out the pink form and fax back to 07 3213 2480 to register and we will send you details of your event.**

# Environmental management – is EMS the answer?

There is a lot of talk these days about EMS – environmental management systems – and how they can be used by Australian farmers.

It is important that growers keep informed about this issue because the idea that Australian farmers should adopt EMSs is gaining momentum.

Certainly most growers recognise that they need to avoid causing environmental problems from farming activities. There's plenty of evidence around of soil degradation, soil erosion, salinity, poor health of rivers and loss of native bushland.

Growers, like all business managers and community members, need to play their part to protect the environment and to manage natural resources efficiently. But do growers need an EMS to achieve this? To think this one through, let's go back a step here.

## What is an EMS anyway?

An EMS is a tool that any business can use to improve its environmental performance through a clearly defined process of planning, implementation and review. Through an EMS, a business:

- ✓ Identifies and prioritises its risks of causing environmental impacts
- ✓ Sets environmental policies and targets
- ✓ Identifies the aspects of its operations that may cause environmental impacts
- ✓ Sets out a program of management to address actual or potential impacts
- ✓ Monitors the effectiveness of management actions
- ✓ Formally reviews and evaluates the system, usually once a year
- ✓ Keeps good records of the system

ISO14001 is the international process standard against which an EMS can be audited and certified.

As you can see, designing, implementing and maintaining an EMS is quite a commitment, regardless of whether or not you chose to have the system independently certified.

## So what are the pros and cons of having an EMS?

Some of the benefits can include:

- ✓ Helps you demonstrate your commitment to minimising environmental impacts from your business
- ✓ Helps you protect your natural capital and ensure the long-term sustainability of your farm
- ✓ Provides a good basis for marketing your produce as environmentally-friendly
- ✓ Ensures you are up to speed with the requirements of all relevant environmental regulations
- ✓ Helps identify efficiency improvements in production process that may lead to reduced production costs

- ✓ Formalising your environmental management may help you get on top of your general business management
- ✓ Keeping better records generates information that helps you make better management decisions
- ✓ Use of a good risk management framework may help you gain better access to finance, insurance, and possibly, down the track, government approvals
- ✓ Helps you discipline yourself to actually take and evaluate management actions and make gradual but continual improvements to environmental management
- ✓ There are opportunities to use the EMS as a structure in which to integrate all of your management considerations, including food safety, quality and possibly financial.

### The disadvantages:

- ✓ Implementing an EMS will cost you time and effort and you may want to buy in help
- ✓ Management improvements you identify may cost time and money to implement
- ✓ Maintaining the system takes a genuine commitment and will almost certainly mean more paperwork
- ✓ At the moment, the only standard available against which an EMS can be independently audited and certified is the ISO14001 standard. This can be expensive and for many growers the costs cannot be justified
- ✓ Critics of the EMS approach say that an EMS does not guarantee a business will achieve good environmental performance, simply that a management process is in place. So an EMS will not convince everyone that a business is environmentally friendly

## Who is driving the EMS agenda in agriculture?

At the moment, the most significant push is coming from the Commonwealth Government. EMS is being promoted as a way for the agriculture sector to address the significant environmental problems affecting rural Australia.

A national framework has been developed to guide the use of EMS in Australian agriculture and a national steering committee has been formed to actively encourage farmers to take up the EMS approach.

Australian retailers have so far demonstrated limited interest in EMS. On the world stage, however, European retailers are promoting a protocol of good agricultural practice, which includes a component on environmental management.

Queensland Fruit & Vegetable Growers (QFVG) has been investigating EMS for the last couple of years. QFVG's position is that EMS may offer a useful management tool for some horticultural businesses, but there should not be an expectation that the majority of growers have one.

*cont. pg. 12*



## WORLD AVOCADO CONGRESS IN MALAGA, SPAIN 19<sup>TH</sup> – 26<sup>TH</sup> OCTOBER 2003

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*cont. from pg. 11*

### **So what does this mean for avocado growers?**

In deciding whether or not EMS would be valuable for you, think about these issues:

- ✓ Are environmental issues important to your customers?
- ✓ Do your competitors have an EMS?
- ✓ Is your property in a sensitive environment where it would be advantageous to be able to demonstrate that your environmental performance?
- ✓ Do you have quality and food safety management systems in place and want to build on these to further develop your competitive advantages?
- ✓ What other options are there for tackling environmental issues?

If you decide you would like more information about EMS, you can:

- ✓ Go to a training course on environmental management or EMS
- ✓ Find out about the Commonwealth government's incentive scheme and the national framework
- ✓ Contact industry groups or government departments for EMS guidelines and templates
- ✓ Check out the EMS navigator at [www.affa.gov.au/emsnavigator](http://www.affa.gov.au/emsnavigator)

**Contact: Jane Muller, Environmental Policy Officer at QFVG for more information on 07 3213 2483.**

# Rootstock Incompatibility – Does it Effect Tree Performance?

A.W. Whiley - Sunshine Horticultural Services, Nambour

Most commercially-produced fruit trees have one thing in common: the scion variety is grafted to a rootstock. Notable exceptions in the subtropical/tropical world are litchi, which is mainly produced from marcots and polyembryonic mango varieties such as 'Kensington Pride' that produce "true to type" seedlings. However, even in these two crops there is evidence showing greater benefits from grafting the fruiting scions to rootstocks.

Within each fruiting species it is normal to find graft compatibility between different varieties/lines so that varying genetic combinations can be used with often different results on tree performance. The apple and citrus industries are prime examples of how rootstock/scion combinations can be used to manipulate orchard production whether it be through disease resistance to soil-borne pathogens or restricted tree vigour to allow higher planting densities and easier canopy management. In other crops there is graft compatibility between different species of the same genus, which can also be used to a similar effect to manipulate tree growth and fruiting. For example, in custard apple *Annona squamosa*, *A. cherimola* and *A. atemoya* are all graft-compatible although physiological incompatibility between them is evident. Similarly, in persimmon *Diospyros kaki*, *D. virginiana* and *D. lotus* are all graft-compatible but show physiological incompatibility that for both crops has variable effects on tree performance.

What is meant by physiological incompatibility? Successful grafting results in the rejoining of the xylem (water conducting) and phloem (carbohydrate conducting) tissues of the scion variety to the rootstock. However, it is the level of tissue integrity established between the two which determines whether or not physiological incompatibility occurs. When present we can clearly see either an under or overgrowth occurring at the graft union caused by unequal exchange of nutrients and carbohydrates between two genetically different parts of the tree.

For avocado three botanical races are recognised within the species. These are *Persea americana* var. *drymifolia* (commonly called the Mexican race), *P. americana* var. *guatemalensis* (commonly called the Guatemalan race) and *P. americana* var. *americana* (commonly called the West Indian race). While all botanical races are horticulturally graft-compatible there is some evidence that they may not be physiologically graft-compatible. Most avocado-producing countries are still using seedlings for rootstocks, the exceptions being California and South Africa where vegetatively propagated (cloned) rootstocks are used for a significant percentage of nursery trees propagated. In

the subtropical regions of the world 'Hass' has become the main variety grown. If we examine its genetic heritage we find that it is a Guatemalan x Mexican hybrid with a predominance of Guatemalan race genes. Seedling rootstocks commonly used in different parts of the world for the production of 'Hass' are 'Lula' (a West Indian x Guatemalan hybrid) in Argentina and the Dominican Republic, 'Mexicola' (Mexican race) in Chile and 'Zutano' (a Mexican x Guatemalan hybrid) in New Zealand. In Australia we draw on a supposedly Guatemalan race population of seedlings but many are hybridised with either Mexican or West Indian races.

There is little doubt that 'Lula' is a poor rootstock to use with 'Hass' as it consistently produces a high percentage of trees that show severe physiological incompatibility. The significant overgrowth of the scion results in disruption of nutrient and carbohydrate movement between the top and bottom of the tree. The overall result is poor tree growth with severe "on"/"off" cropping cycles. In generally, trees appear unthrifty, heavily defoliate during flowering and produce a sparse canopy of leaves during spring and summer. Seedling 'Mexicola' rootstocks used by the Chilean industry also show a high percentage of trees with scion overgrowths (Fig. 1). As has happened in most avocado-growing countries the choice of 'Mexicola' as a rootstock has been one of convenience and availability rather than based on good research.

With 20 000+ ha of avocados planted the Chilean industry has only recently been researching other alternatives. For example, 'Velvick' was imported from Australia in the early 1990's and results this year from a field experiment comparing 'Velvick' and 'Mexicola' grafted with 'Hass' showed trees on 'Velvick' rootstocks produced 8 t/ha at 3.5 years of age while 'Mexicola' produced 2.5 t/ha.

The New Zealand industry is primarily based on seedling 'Zutano' rootstocks. Once again a significant number of trees produce a distinct overgrowth of the scion when compared with the rootstock (Fig. 2). While there is no data to support cropping patterns, growers questioned generally remarked that trees with scion overgrowth were very biennial. In the "on" year trees were very slow to produce new leaves following flowering with many terminals supporting only fruit well into the summer. In sub-tropical Australia such growth would result in sun damage to fruit. The consistency in the scion/rootstock interaction in New Zealand varies among orchards even though "Zutano" was commonly used. Thus, maybe the strength of the union reaction in grafted trees is dependent



*Fig. 1 Incompatibility between 'Hass' grafted to a 'Mexicola' seedling rootstock growing in Chile.*



*Fig. 2 Incompatibility with 'Hass' grafted to seedling 'Zutano' growing in New Zealand.*



*Fig. 3 Incompatibility with 'Hass' grafted to an unknown seedling rootstock growing in South Africa.*

on the variety 'Zutano' seed trees are exposed to during flowering as outcrossing will change the genetic mix in the seed.

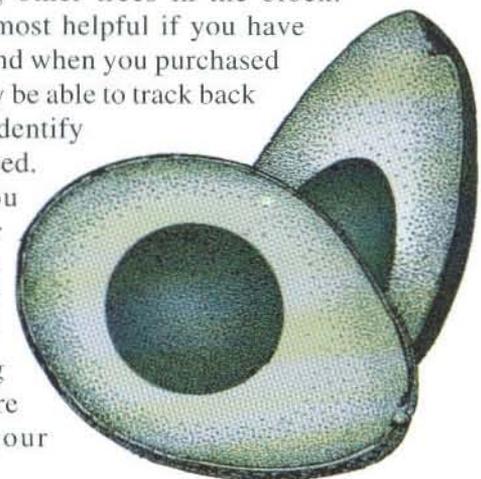
Not all rootstock combinations result in scion overgrowths as rootstocks may also become dominant in the partnership. This is illustrated in Fig. 3 where 'Hass' grafted to an unknown seedling growing in South Africa showed significant overgrowth of the rootstock. Unfortunately there was no observed history available for this tree. Physiological graft-incompatibility in avocados may not always be deleterious to tree performance. The 'Hass'/'Borchard' combination researched in California produces a scion overgrowth but has consistently been one of the higher producers in rootstock research (Mary Lu Arpaia, UC Kearney, pers. communication, 2003).

Physiological graft-incompatibility to varying degrees is widely seen in Australian avocado orchards but we have little information on whether or not the condition is negatively impacting on production. Where information has been collected, trees showing scion overgrowth have been considerably poorer performers than those where overgrowths are not detected at the graft union. In an orchard at Hampton, where individual tree yield was monitored for a number of years, it was evident that those which showed physiological incompatibility (low yielding) had significantly lower production (about 400% less) than trees without graft-union overgrowth (high yielding) (Table 1). Other information from the data shows that the low producing trees with scion overgrowth had a very strong "on"/"off" cropping cycle that was repeated over the six years data was collected. This result is consistent with the observations made by New Zealand growers with the 'Hass'/'Zutano' combination where scion

overgrowth was clearly visible. In comparison, high-yielding trees where graft union overgrowths were not detected had consistently high yields over the six year period (Table 1).

Field observations show quite clearly that many rootstocks used in Australian orchards have physiological incompatibility. Traditionally, and through to more recent times the various nurseries producing trees have drawn on a number of favoured "seed" trees generally selected because of their ability to consistently yield high numbers of fruit that produce vigorous seedlings easily handled in the nursery. However, due to poor record keeping both at nursery and/or farm level we have little idea of which seed source trees are giving us the best performance. We can all do our bit to improve tree performance in the future. I am interested in hearing if you have any information/observations on trees in your orchard with scion overgrowths that are either out-performing or under-performing other trees in the block.

It would also be most helpful if you have details on where and when you purchased the trees as we may be able to track back to the nursery to identify the source of the seed. Alternatively you can contact your nursery men directly to see if there is any chance of tracing seed lines that were used to graft your trees.



*cont. pg. 15*

**Table 1:** Yield comparisons between consistently high and low-yielding trees from 1991 to 1996 (from Thomas, G. 1997. *Proceedings of the Australian Avocado Grower's Federation and New Zealand Avocado Growers' Association Conference '97*. Rotorua, New Zealand.).

Year	Tree description							
	High-yielding (kg/tree)				Low-yielding (kg/tree)			
	R21T8	R22T7	R19T5	Mean	R23T3	R20T8	R14T5	Mean
1991	190	140	138	156	5	1	44	17
1992	183	107	219	170	82	21	95	66
1993	328	325	328	327	57	0	2	20
1994	195	263	228	229	106	61	80	82
1995	256	240	145	214	50	23	8	27
1996	160	302	225	229	145	110	70	108
<b>Total</b>	<b>1312</b>	<b>1377</b>	<b>1283</b>	<b>1324</b>	<b>445</b>	<b>216</b>	<b>299</b>	<b>320</b>
<b>Mean</b>	<b>219</b>	<b>230</b>	<b>214</b>	<b>221</b>	<b>74</b>	<b>36</b>	<b>50</b>	<b>53</b>

### Acknowledgments

The rootstock improvement project (AV01007) is funded by the AAGF and Horticulture Australia.

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# Avocado Promotions

By Wayne Prowse – Horticulture Australia Limited

## Getting the marketing mix right

As any marketing person will tell you getting the right mix of the right product and the right time at the right price with the right promotion is the secret to a successful marketing program. The 2003 Avocado season is no exception. With stronger promotion and more consistent quality demand for avocados, this season has remained strong which is good news for growers.

## Right Product Quality

Consumers expect good clean flesh when they cut avocados and we have long discussed the consumer disappointments. From our post harvest research we know that there is a strong correlation between age of fruit and internal quality so keeping avocados as “young” as possible has been a goal.

The in-store merchandising program has focussed on the age of fruit measured by “packed on” dates vs the date of surveys. It has been good to see averages of 14 days or less.

Combined with improved growing and packing practices to reduce bruising in the supply chain and the realisation that holding on to stock “hoping for a price increase” is false economy consumers are getting better quality avocados and are paying higher \$\$ for them

## \$\$ Right Price

Whilst the price is regarded as the largest influence in the final buying decision once the buyer or consumer has assessed the value of the fruit to them, this does not mean the buyer will buy the cheapest – rather best value. As we are now seeing consumers are happy to pay \$1.29 - \$1.99 regularly for avocados that they can be confident will not be thrown away. The numbers of 66c avocados for sale in retail shops have dramatically reduced and there has been less need to cut prices to clear surplus stock.

Another function of the price consumers will pay also relates to the substitution products. Consumers now appear to see additional value in avocados as a spread compared to other packaged products and combined with the growing awareness of health benefits, good quality and an image that consumers enjoy has brought avocados towards an “everyday” staples where they become part of a shopping list where price has less relevance. They have gone beyond the occasional “luxury impulse” category of a few years ago.

## Right Place

Argue at will about the power of supermarkets, being unfair etc; the bottom line is that the supermarkets and the larger fruiterer chains allow our products to be available to the widest number of consumers who shop there every week. Growers often argue that they achieve better prices at their roadside stall, however to extrapolate this to a national distribution (where every consumer needs to swing past a grower stall every few days for their fruit) and it is quickly seen as impractical. Grower Markets in the cities also have a place, however not many growers assess the real cost of their time and travel to take their fruit in for the marginally better prices achieved.

By working with the major chains to manage fruit displays better this season there has been a wider availability of good quality fruit. Retailers have also been pleased that avocados are a growth category achieving double-digit volume growth with higher prices. Sales through the major supermarkets have been exceptionally strong this season.

The right mix of distribution to supermarkets, fruiterers, grower markets and even roadside stalls, all help ensure that your avocados are widely available throughout the country for maximum sales potential.

## Right Promotion

Promotion is more necessary to sell products that consumers know little about which is why some companies spend more than 20% of sales value on promotion. In the case of avocados most people know what they are, however some gentle reminding of the versatility of uses can help increase the demand!



This year the avocado TV commercials are being run on Channel 7 & 9 in Brisbane, Sydney, Melbourne and Adelaide during May through July. In-store leaflets, and excellent support from journalists and food writers are complementing the TV promotions.

Avocado TV	May	June	July	August
Brisbane	X X X X			
Sydney		X X X	X X X	X
Melbourne		X X	X X	
Adelaide		X X	X	

Consumers, impressed by the visual impact of the TVC, maybe reading more mouth watering articles in magazine, then seeing a good display in the retail outlets, assessing their value of the avocados compared to the price offered as being “in sync” and ultimately enjoying the eating experience completes the marketing mix to generate the best sales potential.

Overall the promotion package combined with generally good quality avocados, reasonable prices for both buyers and sellers and good support in store by the retailers has been the necessary ingredients for a good season. The importance of all aspects working together, not against, is critical.

*For more information contact:*

**Wayne Prowse - [wayne.prowse@horticulture.com.au](mailto:wayne.prowse@horticulture.com.au)**

**Note: Cover Photos used are taken from avocado promotional material.**

## Practical recommendations for canopy management

By John Tyas - Horticulture Australia Limited

Despite significant research in Australia and internationally, canopy management continues to be a major issue for the industry. Although there is general agreement that this is an important issue, there is varied opinion about what should be done.

Some believe that we need to have a much better understanding of the whole plant physiology. Others feel that certain strategies are working well, while others are really struggling to maintain productivity and quality. However, investment of research dollars needs to be carefully managed across the various priority industry needs.

It is not surprising that there is such interest and debate about canopy management, given it has such a huge impact on the viability of an orchard. The current canopy management project (AV00007) has made significant progress in improving canopy management strategies. The project has been extended for one year to June 2004 and during this time we will be conducting a review of this area to develop some practical decision making tools for growers and determine the most appropriate way forward with this research.

In Australia, there are relevant case studies and a significant amount of experience and knowledge. However, the information is scattered and has not been collated or systematically analysed for use by the Australian industry.

This study will investigate and analyse comprehensive data from the wide range of sources and situations where it is held and present it in a usable decision making system. This system will outline the details of various options of canopy management strategies including their characteristics, outcomes in terms of yield, quality and economics and suitability of options to various regions and business situations. The analysis will also highlight deficiencies in current information and systems, research possibilities and associated gaps in information.

The outcomes of the project will include the provision of up-to-date, commercially applicable and comprehensive information on what is currently known including research internationally and commercial experiences. It will also provide a platform for evaluating the research needs of the Australian avocado industry in terms of canopy management and any networks or linkages that should be pursued. This in turn will provide some clear recommendations and act as a tool in decisions regarding future research and development investment.

This project is due to be completed by the end of November 2003.

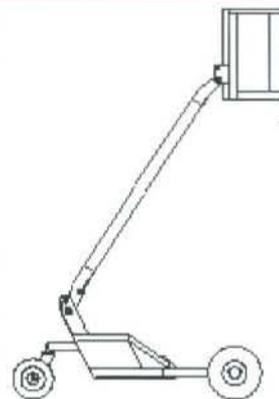
## DON'T FORGET

### Avocado R&D Road Show 2003

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In Conjunction With  
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**Schedule and Venue:** Are as set out on the pink insert in this issue of Talking Avocados.  
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SUNNY® is a highly effective plant growth regulator for increasing the size of avocado fruit.

First registered in 2001, SUNNY® has been adopted by many growers as an important input in the production of premium grade fruit.

Previously the product was only registered for use in Queensland and NSW and for use on Hass, Fuerte and Pinkerton varieties.

The "all States and all varieties" registration will be welcomed by many growers who were previously excluded from using the product.

Other important changes to the label are improved directions for use to help ensure growers get the best performance from SUNNY®. These include:

- Reduction of the registered use rate to 0.5L-1L/100L of water
- Clarification of rates for dilute and concentrate spraying
- Increased information on optimal timing of application, direction of spray to the tree canopy and mixing instructions

"The label has been fine tuned to reflect commercial application practices that have proven to work well in Australian orchards," said Patrick Press of Sumitomo Chemical.

"Much of this feedback came from grower field walks held last season in conjunction with Avoman, where growers were encouraged to share their experiences with SUNNY® and discuss how to get the best out of the product.

"Discussion on other orchard management practices such as nutrition, water and tree health and their importance to SUNNY® performance was very useful.

"Clearly many growers are getting excellent financial returns from SUNNY® and there is no doubt that this information is most plausible when related directly from a grower to his peers," said Patrick.

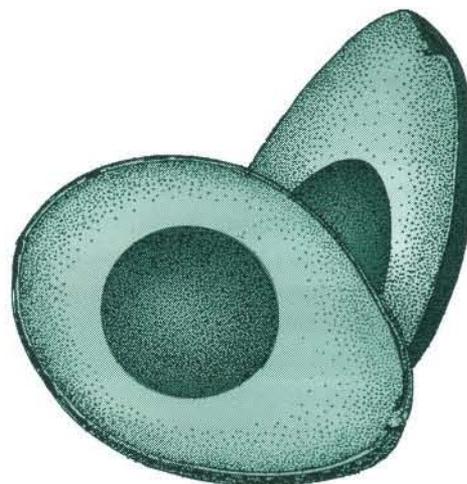
To date the adoption of SUNNY® has been highest among large operators in Queensland.

"In 2002 we noticed a host of new growers purchased product to test it on their properties which was most encouraging. Feedback on pack-outs and financial returns have been very positive."

Mr Press said that SUNNY® was a productivity proposition that needed to be weighed up by each grower. "You don't need SUNNY® to grow a crop of avocados. However, if you are looking to lift the average size of fruit and obtain the financial benefit of premium grades, then SUNNY® has to be considered."

Meanwhile work continues on the use of SUNNY® for canopy management by Dr John Leonardi. "Once Maximum Residue Limits have been set to allow application to hanging fruit, this use will be pursued for registration," he said.

*A copy of the new SUNNY® label can be down loaded from the Sumitomo Chemical Australia website - [www.sumitomo-chem.com.au](http://www.sumitomo-chem.com.au).*



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## Generic Barcode Sticker for Avocados

AAGF is pleased to announce the successful implementation of a generic barcode sticker for "Hass" avocados. "Hass" barcode stickers will be available in the following sizes, small, medium and large. These barcode stickers have been accepted by both Woolworths and Coles for immediate acceptance into their systems. After 18 months of work and development there is now **one** barcode sticker for both the major supermarkets.

The use of the sticker is tied to a unique grower/packhouse Barcode Registration Number (BRN) that will be allocated by AAGF (upon application) for inclusion on the sticker. Only growers and packhouses with this BRN will be authorised to use the barcode sticker. There are currently two authorised label printers that you can purchase the

sticker through, Label Press and Compass Labels. Once you have your BRN you may order the sticker direct.

The variety "Hass" is the first in a range of barcode stickers to be released.

"Shepard" is the next to be processed and should be in place in the next few weeks.

AAGF sees this sticker as a positive step towards streamlining packing and marketing of avocados across Australia.

*For further information regarding the sticker or to apply for a grower/packhouse BRN, please contact Antony Allen on 07 3213 2477 or via [a.allen@aagf.org.au](mailto:a.allen@aagf.org.au).*



## Avoid planting Phytophthora infected windbreak trees and ornamental plants near your orchard.

By Ken Pegg

Many of the plants used for windbreaks and as ornamentals are susceptible to *Phytophthora cinnamomi*. *P.cinnamomi* is known to have a very wide host range with over 1000 varieties and species of plants affected. Many Australian and South African native plants are particularly vulnerable to disease.

*P. cinnamomi* is a soil-borne pathogen that survives in infected roots as mycelium or chlamydospores. When environmental conditions are favourable (temporary flooding, soil temperatures of 21-30 degrees C), sporangia release zoospores that swim through the soil water or are carried by surface floodwaters to new hosts. Thus the pathogen can readily move from infected windbreak trees and ornamental plants into an avocado orchard which has been established with trees from an ANVAS accredited nursery.

Where possible only purchase windbreak trees and ornamental plants from a nursery which participates in the NIASA accreditation scheme where plants are regularly checked for the presence of *Phytophthora*.

If you still suspect a problem in a NIASA nursery ask the manager if you can take a representative sample of roots and potting mix from the plants you intend to buy and have them checked for the presence of *P.cinnamomi*. A reliable testing service is offered by Grow Help Australia, Redlands Research Station, PO Box 327, Cleveland, Qld 4163. The prevention of disease by limiting the introduction of the pathogen is very important.

## ANVAS Accredited Nurseries

ANVAS accredited trees can be purchased from the following nurseries:

### Anderson's Nursery

Graham and Vivienne Anderson  
Duranbah Road, Duranbah NSW  
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### Batson's Nursery

Merv and Pat Batson  
Schulz Road, Woombye Qld  
Phone: 07 5442 1657

### Birdwood Nursery

Peter and Sandra Young  
71 - 83 Blackall Range Rd, Nambour Qld  
Phone: 07 5442 1611

### Rainforest Nursery

Ron and Joan Knowlton  
25 Reynolds Street, Mareeba Qld  
Phone: 07 4092 1018

# Incidence of pepper spot on 'Hass' avocado fruit

By *Fiona Giblin* - CRC for Tropical Plant Protection, The University of Queensland, DPI, 80 Meiers Road, Indooroopilly, 4068, Qld. Email: [Fiona.Giblin@dpi.qld.gov.au](mailto:Fiona.Giblin@dpi.qld.gov.au)

## Industry Relevance

Preliminary data suggests:-

- 1 Pepper spot is caused by *Colletotrichum gloeosporioides* and is especially severe on fruit affected by mild sunburn. Thus, the disease can be quite prevalent in trees affected by *Phytophthora* root rot where the canopy density is reduced and sunlight exposure to fruit is increased.
- 2 Pepper spot does not appear to progress to a fruit rot. However, severe symptoms will downgrade fruit quality.
- 3 Rootstocks seem to influence the incidence and severity of pepper spot. In inoculation studies, 'Hass' on Guatemalan rootstocks developed less disease than 'Hass' on Mexican rootstocks. This may be due in part to the effect of rootstocks on fruit skin minerals but is also likely to be due to the influence of rootstocks on the levels of enzymes such as peroxidases which play a key role in phenol production and lignin synthesis.
- 4 Tear stain and anthracnose isolates of *Colletotrichum gloeosporioides* from mango are weakly or non pathogenic on avocado.

**NOTE:** In field trials conducted by Tony Cooke at Mt. Tamborine, copper and strobilurin (Amistar®) sprays effectively reduced pepper spot levels and also controlled anthracnose.

## Introduction

*Colletotrichum gloeosporioides* (Penz.) Penz & Sacc. continues to cause significant postharvest losses of avocado due to large, spreading anthracnose lesions on the surface of ripening fruit. In the past decade, a preharvest fruit spotting symptom on avocado cv. Hass has become evident in south-east Queensland and north-east New South Wales (Willingham *et al.* 2000).

This disease, also caused by *C. gloeosporioides*, is called pepper spot because numerous small, shiny, black lesions form on the surface of the skin. It is more prevalent on sun-exposed surfaces and symptoms usually develop from mid to late summer. A similar symptom occurs on mango fruit where the small, black lesions develop in a tear staining pattern.

In some areas of southern Queensland, the blackening of fruit due to extensive pepper spot infection has caused substantial crop loss as fruit quality is reduced and fruit become unmarketable.

The current PhD project is investigating relationships among strains of *C. gloeosporioides* attacking avocado and mango fruit. In particular, the pathogenicity and molecular diversity of *C. gloeosporioides* isolates from different symptom types, hosts and growing regions are being evaluated. The influence of rootstock on disease development is also being investigated.

Initial field trials in 2000/2001 were carried out at Mt. Tamborine (Charlie Eden's property) and current trials are being undertaken at Duranbah (Graham Anderson's property). Further assessments will be undertaken at Mt. Tamborine before the end of this season.

## Collection

*C. gloeosporioides* isolates were collected from avocado (cv. Hass) and mango (cv. Kensington) fruit showing preharvest (i.e. pepper spot symptoms in avocado and tear stain symptoms in mango) and postharvest (anthracnose) symptoms. Five sites across northern NSW and south-east Qld were chosen for the

collection (Bangalow, Cudgen, Duranbah, Green Pigeon and Mt Tamborine). Fifty isolates were obtained from each site: 25 anthracnose and 25 pepper spot isolates. Similarly, 50 mango isolates each were collected from two sites in NSW (Bangalow and Green Pigeon) and one in Qld (Ayr). Isolates are stored in a large collection at DPI Indooroopilly.

## Trials

Several trials have been carried out over a number of seasons to examine the processes of infection.

For pathogenicity tests, selected *C. gloeosporioides* isolates were used to inoculate avocado fruitlets in the field and detached, mature fruit in the laboratory. In the field, fruit were selected at random and tagged. Spore suspensions were prepared from each fungal isolate ( $5 \times 10^6$  conidia/mL) to make up treatments while water was used for controls. Each tagged fruit, including the pedicel, was immersed in the appropriate suspension for 60s and symptom development assessed at regular intervals.

The same isolates were used in the laboratory for inoculation of detached fruit. Sites were marked on each fruit and fruit were inoculated by placing a filter paper disc, saturated in the spore suspension, onto the surface of fruit and incubated at 25°C (95%RH) for 48h. Following incubation, fruit were transferred to 23°C (65%RH) before being assessed for lesion development at the "eating-ripe" stage.

**Pathogenicity tests in the field revealed that avocado fruitlets developed typical symptoms of pepper spot from both pepper spot and anthracnose isolates within 2 weeks of inoculation.**

Detached fruit inoculated with the same isolates developed typical symptoms of postharvest anthracnose at fruit ripeness. There is no evidence at this stage to suggest that a pepper spot type infection will ultimately develop into anthracnose. A fruit can be virtually covered in pepper spot lesions but when ripened and peeled may be completely free of anthracnose.

As speculated in South Africa (Schoeman and Manicom, 2000), the developmental stage of the fruit may be an important factor in susceptibility of avocado to pepper spot. Our pathogenicity trials using more developed fruit indicate that fruit are less susceptible to infection at this stage of maturity. Reports from South Africa also suggest that incidence is greater during wet periods.

**Field inoculation experiments carried out over an entire growing season have determined that pepper spot incidence and severity in 'Hass' avocado are directly correlated with fruit maturity and inoculum concentration.**

Resistance to disease is being monitored by measuring antifungal compounds and associated pH levels in the skin of the fruit throughout the 2002/2003 growing season.

Trials for the 2003 season are continuing and will assess variation of disease incidence on avocado fruit on several different rootstocks ('Nabal', 'P1', 'Anderson 8', 'Anderson 10') and on trees ('Velvick' and 'Duke 6') receiving high or low nitrogen treatments. Mineral nutrient levels of dried, ground leaf and fruit skin samples will be quantified.

A current trial is monitoring pathogenicity of 80 isolates of *Colletotrichum gloeosporioides* on 'Hass' avocado petioles and leaves on young grafted trees ('Velvick' rootstock) in pots in the glasshouse. Plants were inoculated in April (2003) and symptom development should occur soon.

The same isolates were also inoculated onto detached 'Fuerte' cocktail avocados in the laboratory in mid May (2003). Anthracnose lesion development is being rated daily.

## Molecular studies

DNA has been extracted from isolates collected from anthracnose and pepper spot lesions on avocado and anthracnose and tear staining lesions on mango from several geographic sites. Genetic variation among *C. gloeosporioides* isolates is being analysed using a modified DNA amplification fingerprinting (DAF) system as described by Bentley and Bassam (1996).

Previous studies (Hayden *et al.* 1994) have shown that isolates of *C. gloeosporioides* from avocados vary considerably in DNA fingerprint patterns, whereas mango isolates are comparatively uniform, irrespective of geographic origin.

**Preliminary analysis has revealed that there is considerable genetic diversity among isolates from both pepper spot and anthracnose lesions in avocado, including some overlap of strains from both the pepper spot and anthracnose collection, although there is less diversity within the fungus isolated from pepper spot lesions than from anthracnose lesions.**

The lack of genetic diversity within mango isolates corresponds to our findings that the sexual stage of the fungus is lacking (ie. no ascospores have been seen). Ascospores have been observed in some avocado isolates and this varies from orchard to orchard. Sexual reproduction allows recombination of genetic factors and selection favours such traits as survival and virulence. It is possible that pepper spot isolates are the result of sexual recombination or mutation of *Colletotrichum gloeosporioides* to produce more aggressive progeny. This occurs more frequently in agricultural systems, particularly where monocultural practices are applied.

Ultimately, such diversity work will ascertain if there are distinct strains of *C. gloeosporioides* causing avocado pepper spot or mango tear stain versus anthracnose.

## Histopathology

The mechanisms by which *Colletotrichum gloeosporioides* penetrates avocado skin have been studied over several decades. Using histopathological techniques, it has been established that anthracnose lesions are initiated by direct penetration by the fungus into the surface of the skin of immature fruit. The fungus is then suppressed but growth resumes as the fruit starts to ripen (Coates *et al.* 1993).

Pepper spot symptoms occur on the green skin surface while fruit are still on the tree. This is thought to be a hypersensitive response, whereby cell death occurs at the point of pathogen penetration. Thus, pathogen growth within the tissues is inhibited and lesion development is limited. This is typical of an incompatible interaction of host and pathogen.

The purpose of our study is to compare cellular processes occurring under pepper spot isolate invasion compared with the latent infection occurring during anthracnose development.

**Avocado fruit has a thick wax layer and cuticle and at the site of pepper spot lesion development enhanced thickening has been observed.**

There is some evidence of barrier formation and cell death. These processes are still under investigation.

## Future Work

All experimental work for this project will be completed and analysed over the next few months and a written thesis will be prepared by early 2004.

## Acknowledgements

This project is being funded by CRCTPP, AAGF and HAL. Research is supervised by Dr Lindy Coates and Prof. John Irwin.

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# Effect of harvesting methods and maturity on stem-end rot of 'Hass' avocado

By Jay Anderson - Plant Pathologist, Horticulture Agency for Food and Fibre Sciences  
Department of Primary Industries, Indooroopilly - Jay.Anderson@dpi.qld.gov.au

Although not considered as serious as postharvest anthracnose, stem-end rot can at times be responsible for substantial losses. In my research I like to differentiate between stem-end rot caused by the anthracnose pathogen *Colletotrichum gloeosporioides* (Cg) (Figure 1) and stem-end rot (SER) caused by a number of other fungi (Figure 2). These are mainly *Dothiorella* spp., *Lasiodiplodia theobromae* and *Phomopsis perseae*, but other fungi such as *Thyronectria pseudotrichia*, *Fusarium* sp., *Pestalotiopsis versicolor*, *Botrytis* sp. and *Rhizopus stolonifer* are sometimes associated with the disease.

Field sprays with copper fungicides and azoxystrobin (Amistar®) give some control of stem-end rot. Postharvest treatment with prochloraz gives control of stem-end rot caused by the anthracnose fungus Cg, but this chemical is relatively ineffective against the other stem-end rot fungi. Stem-end rot is also reduced by good orchard hygiene and minimisation of stress (eg. drought, *Phytophthora*, waterlogging, poor soil aeration, poor nutrition).

The method of harvesting can also affect stem-end rot. Simon Newett in his revised notes for AVOMAN help files



Figure 1. Stem anthracnose



Figure 2. Stem-end rot

suggests that snap picking of 'Hass' should only be considered under the following circumstances:

- Trees are healthy and not stressed
- Fruit is fully mature but not over mature (about 23 to 29% dry matter)
- Fruit is not picked in a wet or humid environment
- Growth regulators (eg. Sunny®) have not been used (fruit are prone to skin tearing when snap picked).

cont. from pg. 21

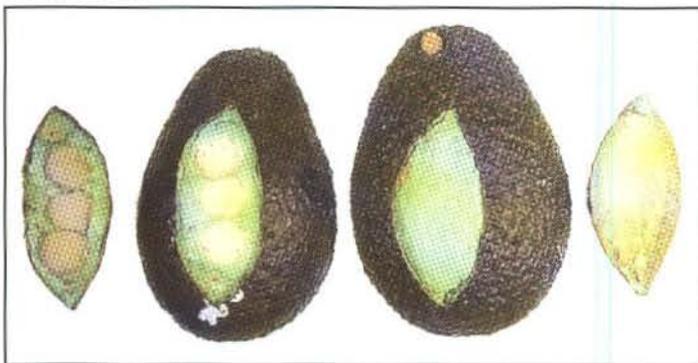


Figure 1: Detached fruit inoculated with pepper spot isolates developed typical symptoms of postharvest anthracnose by fruit ripeness.



Figure 2: Typical symptoms of pepper spot often associated with sunburn

Table 1: Influence of rootstock on pepper spot development on "Hass" fruit following field inoculation with *Colletotrichum gloeosporioides*.

Rootstock	Pepper spot severity*
Nabal (Guatemalan)	1.4
Anderson 8 (Guatemalan)	1.5
Anderson 10 (Guatemalan)	1.9
<b>P1 (Mexican)</b>	<b>2.6</b>

\*Ratings from 1 (low) to 5 (high).

**Snap harvested fruit which do not meet these criteria tend to have higher levels of stem-end rot and also tend to ripen significantly faster than clipped fruit.**

My research outlined in the following report addresses the first three of the issues listed above.

In 2002 I harvested early and late 'Hass' fruit from three locations and examined the effect of harvesting method on the incidence and severity of stem-end rot.

**Methods**

In fully replicated experiments fruit were either snap or clip harvested<sup>1</sup> and immediately packed into count 20 cartons in the field. Fruit were bought back to Indooroopilly Research Centre and allowed to ripen at 22°C and 65% relative humidity until eating soft as determined by hand. Fruit were

not treated with prochloraz and high humidity was used in order to maximise disease development. Fruit were then peeled and assessed for the severity and incidence of stem-end rot. Severity is the average area of flesh decay as a result of stem-end rot of each fruit and incidence is the percentage of fruit in the sample affected by stem-end rot.

Isolations were carried out on diseased tissue to determine the fungi causing the stem-end rot, the results were divided into stem-end rot caused by the anthracnose fungus *Cg* (stem anthracnose) and stem-end rot (SER) caused by other fungi. Data was analysed using analysis of variance. Marketable fruit was calculated as the percentage of fruit with less than 5% of fruit surface area affected by anthracnose (data not presented in this report) and no SER. A sample of fruit was taken at each harvest for dry matter determination.

**Results and discussion**

**BUNDABERG**

Table 1. The effect of harvesting method and maturity (early vs late season) on the mean incidence and severity of stem anthracnose and stem-end rot in 'Hass' avocado harvested from Bundaberg in the 01/02 harvest season.

Treatment	Days to Eating Ripe	Stem anthracnose		SER- other fungi		Marketable Fruit (%)	Dry Matter (%)
		Severity (%)	Incidence (%)	Severity (%)	Incidence (%)		
Bundaberg early harvest							
Clip	17.61	9.15	49.5	2.91	8.8	33.8	22
Snap	17.34	8.14	39.4	5.08	19.4 *	26.4	
Bundaberg late harvest							
Clip	13.1	1.45	17.6	2.74	12	61.6	24
Snap	12.8	1.29	10.6	4.26	16.2	57.9	

\* Significantly different from clip harvested fruit at P=0.05

- The fruit from the Bundaberg harvest were from severely drought stressed trees. This meant that the dry matter content for this harvest maybe a false dry matter (fruit took more than 17 days to ripen).
- The incidence of stem-end rot in snap harvested fruit from the early harvest was significantly higher than the clip harvested fruit. The SER fungi isolated from the fruit were mostly *Lasiodiplodia theobromae*, *Dothiorella* spp., *Fusarium* sp., and *Pestalotiopsis versicolor*.
- There was high incidence and severity of stem anthracnose in the early season fruit but there was no significant difference between clip and snap harvested fruit.
- As well as having less disease than the early season fruit, the fruit from the late harvest had a higher percentage of marketable fruit due to its greater maturity.

**MT TAMBORINE**

Table 2. The effect of harvesting method and maturity (early vs late season) on the mean incidence and severity of stem anthracnose and stem-end rot in 'Hass' avocado harvested from Mt Tamborine in the 01/02 harvest season.

Treatment	Days to Eating Ripe	Stem anthracnose		SER- other fungi		Marketable Fruit (%)	Dry Matter (%)
		Severity (%)	Incidence (%)	Severity (%)	Incidence (%)		
Mt Tamborine early harvest							
Clip	11.13	0.53	5.62	0.19	0.63	96.3	2
Snap	10.55	7.72 *	24.37 *	0.05	0.63	79.4 *	
Mt Tamborine late harvest							
Clip	13.27	3.39	33.13	2.94	10.00	71.3	33
Snap	11.56 *	4.74	30.00	2.87	13.13	61.9	

\* Significantly different from clip harvested fruit at P=0.05

- The fruit in the initial test at this site were harvested wet because conditions were misty until noon.
- There was high stem anthracnose incidence and severity under the humid conditions, with greater stem anthracnose in snap picked fruit. It is important to use prochloraz within 24 hours to control postharvest anthracnose as Cg (the anthracnose pathogen) is able to form infection structures to invade fruit within that time.
- Late harvested fruit had an average dry matter of 33%, over-mature snap harvested fruit ripened more quickly but did not develop more stem-end rot than clip harvested fruit.
- Fruit from the late harvest were less marketable than fruit from early harvest due to over-maturity.

### NORTHERN NSW

Table 3. The effect of harvesting method and maturity (early vs late season) on the mean incidence and severity of stem anthracnose and stem-end rot in 'Hass' avocado harvested from Northern NSW in the 01/02 harvest season.

Treatment	Days to Eating Ripe	Stem anthracnose		SER- other fungi		Marketable Fruit (%)	Dry Matter (%)
		Severity (%)	Incidence (%)	Severity (%)	Incidence (%)		
Northern NSW early harvest							22
Clip	13.00	5.49	24.00	3.75	11.7	65.5	
Snap	12.39 *	3.13	16.40	2.35	8.1	71.1	
Northern NSW late harvest							29
Clip	7.1	0.01	0.56	0.01	0.46	64.7	
Snap	7.1	0.12	1.45	0.36	2.04	64.6	

\* Significantly different from clip harvested fruit at P=0.05

- Early snap harvested fruit from Northern NSW ripened significantly faster than clip harvested fruit. The fruit from the early harvest had a dry matter of 22% whilst the fruit from the later harvest had a DM of 28%.
- There was no influence of harvesting method on stem-end rot as fruit were harvested in dry weather from trees that were not under stress.

### Summary

The aim of my research is to increase consumption of this wonderful fruit by having good quality fruit at the retail level and to achieve this by improving their agronomy (including harvesting) so as to reduce reliance on agrochemicals.

The data gathered in this study supports Simon Newett's comments in updated AVOMAN.

- **Do not snap harvest wet fruit as high relative humidity induces anthracnose invasion of the stem-end**
- **Do not snap harvest fruit from stressed trees at any time**
- **Do not snap harvest under- or over-mature fruit as they ripen more quickly and may have more stem-end rot**

### Acknowledgements

Funding provided by Australian Avocado Growers' Federation, Horticulture Australia Ltd., Cooperative Research Centre for Tropical Plant Protection and Queensland Department of Primary Industries.

Technical assistance provided by Tony Cooke and Jan Dean. Research supervised by Lindy Coates and Ken Pegg.

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<sup>1</sup> Snap harvested fruit are pulled from the tree leaving no part of the stem on the fruit. Clip harvested fruit are cut from the tree using secateurs. A second cut maybe required to trim the stem to 2mm.





As a member of the Management Committee of the NSW Avocado Growers' Association, I was recently involved in a meeting between the Committee and the Executive of the AAGF. The meeting was about the Constitutional change of AAGF that would see it become a company limited by guarantee called Australian Avocado Growers Limited (AAGL).

My concern at aspects of the proposed changes to the AAGF Constitution prompts this letter.

The Directors of the AAGF have identified problems with the current Constitution and, rather than address these problems, have opted to change the whole structure from a Federation to a Company. I have no problem with this in principal. However, in taking this option they have been at pains to make the new structure as flexible as possible. The proposed new structure is therefore 'long' on flexibility and 'short' on accountability.

Far too many of the operational aspects of the revised AAGL will be at the discretion of the board. For example, Australia is to be split into 'growing areas' based on production volume without regard to grower numbers. These 'areas' would be entitled to nominate a director to the AAGL. The criteria for establishing 'grower areas' are not prescribed in the new Constitution. They will be decided by the board based on a running average of production coming from these 'areas'. With the vagaries of production season to season, this could see 'areas' being folded into each other to maintain the production required to be an 'area' or these production figures could be a moving target.

All such decisions would be at the discretion of the board. There is to be no account of State boundaries in setting up these 'areas'. This will work heavily against individual growers dealing with the ever-increasing regulation of the industry by State authorities that are not in concert with each other.

The lack of account being taken of growers in the decision making process and its reliance on production I believe tends to disenfranchise growers and places greater emphasis on production than on individual grower's interests.

As in any company there will be shareholders, but to become one and be able to vote at 'AAGL' meetings, growers will have to pay a membership fee set by the board.

Alternative approaches incorporating grower numbers into the decision process have been put forward, but at the moment seem to have little chance of being accepted.

It appears to me that the progression of this push for constitutional change of the AAGF has gone forward with undue haste, without any opportunity for input from growers at the 'grass roots' level on the issues that make the 'nuts and bolts' of their Peak Industry Body the sort of organization they would want to represent their industry.

Talking Avocados is presently the vehicle that provides ongoing information on Research and Development outcomes to all growers (levy-payers). This is a basic right and should be enshrined in any new Constitution to remain so, in whatever form to which T.A. may mutate e.g. electronic dissemination.

The Editor,

It was to my surprise that while attending our NSW Avocado Association's AGM in March of this year, growers were presented with a folder which related to proposed options to be considered in order to update or change the current AAGF constitution.

I would have welcomed the opportunity to participate in any such proposal. However, we were quickly informed by our Industry Development Manager, that the AAGF Board of Directors had already passed a motion to move from our current situation and commence establishing a new industry structure (AAGL) as a Company limited by guarantee under Corporations law.

There is no doubt that our current constitution has been badly in need of being updated for many years. However, it has served us well. To make the move away from our current Federation is a major move and ultimately involves all the growers in our industry.

Why then, haven't the growers been given the opportunity to contribute to such an important decision?

Given that there has been no mention in Talking Avocados by the AAGF Board of their intentions, I feel the AAGF Board have let their growers down badly by failing to involve them in the process and ultimately taking the growers for granted. Furthermore, it is my opinion that the driving force behind this sudden concern to operate under an updated and legal constitution is being brought on by the changes to QFVG. That being the case, the Queenslanders are turning a state issue into a federal issue.

Whilst we all have to work together to ensure a strong and united industry, sometimes it is inevitable that changes are necessary and not always popular to all growers. However, it should not mean that openness and transparency should be replaced with arrogance and stealth.

The challenge now for the AAGF Board is to get growers to financially support their changes (which they will need) when they never had the decency to ask for grower input.

**Frank Moore**

9<sup>th</sup> June, 2003. 🌱

In conclusion I believe the Constitution should be:

- I. More prescriptive in respect of the mechanism for deciding what constitutes a 'grower area';
- II. This mechanism should employ both grower numbers and production volume in the process;
- III. The 'grower areas' should not cross State boundaries; and
- IV. T.A. should be specified in the constitution as the vehicle for providing, free to all levy-payers, the results of industry research.

This approach would cause the board to have to 'go to the people' if it wished to make changes in these important areas.

**Geoff Betts**

8/6/03 🌱



The Editor,

On behalf of the Board of the AAGF I must take this opportunity to clarify the position with respect to the proposed changes to the constitution of the AAGF as raised by Mr Moore in his *Letter to the Editor*.

The current Federation structure means that the members of the AAGF are the State grower bodies and there are major members having greater than 20% of national production and minor members having less than 20% of national production. As a consequence the AAGF Board currently has 4 delegates from Qld and 1 from each of NSW, SA and WA.

As David Rankine pointed out in a letter to Talking Avocados in March 2001, growers are not able to *"have any say or control over their industry. At the Annual General Meeting, growers do not approve the policies, finances or decisions of the Board. No grower or growers may move a motion of censure or a motion of no confidence in the Board and the Board has no responsibility to the growers"*.

The AAGF Board acknowledged at its meeting in October 2002 that the current constitution and structure needed to be updated. A sub-committee was formed and the process of reviewing the organisations structure was commenced. The major stages in that process are detailed below.

1. Sub-committee sought legal advice on the options which should be considered.
2. An options paper was prepared for the March 2003 Board meeting.
3. The AAGF Board moved to *"Provide direction to drafters/legals to draft the constitution based on Option 2"* at the March meeting. This motion was supported unanimously. Option 2 referred to the formation of a new industry structure as a company limited by guarantee under corporations law with individual levy payers as grower members.
4. Draft constitution prepared by legal advisors.
5. Draft constitution reviewed by the AAGF Board in June 2003. If the draft constitution is endorsed by the AAGF Board it will then be presented to growers as a recommendation of the Board at the "Roadshows" which will be held in the various regions between July and November.
6. A final constitution which may include amendments raised during the consultation process will be adopted and implemented effective 1st January 2004, if it has received support during that consultation process.

A number of points raised by Mr Moore need to be clarified.

1. The *"folder which related to proposed options"* was a Board options paper and had not been prepared for general distribution.
2. Growers will have an opportunity to participate in the process through attendance at the "Roadshows" and through their Board Director.
3. The fact that the Board was moving towards a new constitution was reported in the Autumn 2003 edition of Talking Avocados.
4. The changes in structure at QFVG simply mean that with the Federation structure QFVG could remain the member of AAGF however it would not necessarily represent all Qld avocado growers. This would be a similar situation to NSW where only some 20% of the avocado growers in NSW are members of NSWAGA.

The Board is strongly of the view that all avocado growers should have an opportunity to influence the industry's national direction. Each levy payer will be able to register as a "Grower Member" and has:

- The right to stand as a candidate for election as a Director of the new organisation.
- The right to elect Directors of the new organisation.
- The right to propose and vote on resolutions put before general meetings of the company.

The legal advice to the Board has been that a company limited by guarantee is the most appropriate structure to provide growers with this involvement.

It is proposed that a membership fee will be implemented, the quantum and justification of which will be presented at the "Roadshow".

The draft constitution provides for a Board of 7-10 Directors elected from electorates which will be determined based on geography and production.

The AAGF Board encourages you to become involved in this process. Attend the "Roadshows" and discuss the proposal with your local Director or contact me.

**Rod Dalton**

President AAGF



# Avocado R&D Road Show 2003

**Presented By The**  
**Australian Avocado Growers Federation Inc**  
**In Conjunction With**  
**Your Local Grower Organisation**

8:30 am	Welcome
9:00 am	Tony Whiley – Avocado Researcher “Rootstocks, varieties and viroids – what you should know!”
9:25 am	John Leonardi – AAGF Avocado Researcher “To prune or not to prune” Developments in Canopy Management
9:50 am	Local Presenter
10:10 am	Break
10:40 am	Ken Pegg – Plant Pathologist “Integrated management of avocado diseases”
11:05 am	Antony Allen – AAGF Industry Manager “Marketing and promoting the world’s most nutritious fruit”
11:30 am	Simon Newett – QDPI Senior Extension Horticulturist “Avoman 2- simpler, smarter, more powerful”
11:55 am	Local Presenter
12:15 pm	Rod Dalton – AAGF President “Industry leadership now and into the future”
12:40 pm	Lunch
2:00 pm	Farm and Packing Shed Walk
3:30 pm	Panel of Wisdom Question and Answer Session with all Presenters
4:30pm	Finish Drinks
<b>Venue:</b>	Are as set out on the pink insert in this issue of Talking Avocados.
<b>Date:</b>	Check your closest “Road Show Day” for its date
<b>Start Time:</b>	8:30 am

The “Road Show” offers to all growers the opportunity to learn, inspect and discuss various horticultural techniques and technologies in practice, as well as the opportunity to examine many current research sites to see some of the alternative strategies being investigated by researchers. It is an opportunity to discuss the interpretation and implementation of research outcomes at a regional level and to see current on farm research and practical applications of previous research in the growers own growing region.

Have direct access to all these experts and the AAGF team to extract the information you need to work smarter, improve your productivity and increase your bottom line. The day is all inclusive, R&D Experts, Industry Leadership, food and drinks will be supplied.

**Fill out the pink form and fax back to 07 3213 2480 to register and we will send you details of your event.**

# Talking Avocados

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