



The Australian Newsline

Vol 9 Number 4

# Talking Avocados



December 1998



## A Sample of Llanos Hass Avocados

- AVOMAN Rebates
- Quality still a problem
- Fruit Spotting Bug Update Report
- AAGF Annual Report

# AUSTRALIAN AVOCADO GROWERS' FEDERATION

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**Talking Avocados** is the official magazine of the Australian Avocado Growers' Federation and in conjunction with the Australian Horticultural Corporation is published four times a year (March, June, September and December).

This publication is distributed upon the understanding that the publisher is not engaged in legal, cultural or other professional advice. The Editor, Directors and Executive Officers of the Australian Avocado Growers' Federation Inc (ACN Number IA 5122) do not accept any liability for and/or necessary enclose and/or concern and/or support any of the claims and/or statements made and/or views and/or opinions expressed anywhere in any edition of "Talking Avocados".

## Calendar of Events 1999

### January

- 12 **Avocado Growers' Association of WA** - meeting Conference Room, Market City commencing 5.30 p.m.

### February

- 17 **Bundaberg & District Orchardists Association** - meeting Fruit & Vegetable Growers' Office, Barolin St. Bundaberg commencing 7.30 p.m.

### March

- 2 **Avocado Growers' Association of WA Annual General Meeting** - Conference Room, Market City commencing 5.30 p.m.
- 17 **Bundaberg & District Orchardists Association** - meeting Fruit & Vegetable Growers' Office, Barolin St. Bundaberg commencing 7.30 p.m.

### Queensland Field Trip

The Coffs Harbour Branch of the NSW Avocado Association is organising a field trip to Queensland. The trip will be in the first 2 weeks of March 1999, the actual date to be confirmed.

Proposed itinerary 4 days/3 nights visiting the following avocado areas: Tweed, Nambour, Childers, Bundaberg and Toowoomba.

Estimated cost is \$300 per head for Association members and \$350 for non-members (includes transport and accommodation costs). An allowance of an additional \$100 should be made for meals. If the bus is full the trip will be cheaper per person, but if you don't wish to share a motel room it will be more expensive.

PLEASE contact either Andrew Wright on 02 6653 6087 or Chris Nelson on 02 6569 0881 by 15 January to reserve your seat on the bus. A deposit of \$50 per person is payable at time of booking. We have a limit of 46 passengers.

### Front Cover:

Examples of a new variety of avocado called "Llanos Hass".

### Back Cover

Anthony Llanos of WA holding his World Record Avocado (see page 5).

## New Recruit to Avocados

John Leonardi is our latest recruit to the team working on R & D issues on behalf of the Australian avocado industry. John grew up on a cattle property just north of Maryborough in Queensland and while a rural career was to be expected, by the time decisions had to be made he had developed a strong interest in horticulture. In 1989 he graduated with a Bachelor of Agricultural Science (Honours) from the University of Queensland.

John started his PhD studies in 1990 investigating factors limiting fruit set and retention in cashew nut (an emerging new crop in the Northern Territory and North Queensland) and has recently submitted his thesis for examination.

In the interim period he has worked with a number of crops including floral biology of macadamia, nutrition and irrigation of culinary bamboo, vineyard establishment and papaya dieback. More recently John has been working with CSIRO at Darwin where, for the last three years, he has been

involved with various aspects of mango production.

John replaces Dr Clive Kaiser in the "Canopy Health and Management" project and will continue the work that Dr Kaiser started. We take this opportunity to thank Clive Kaiser for his contribution to this project and the Australian avocado industry.

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# From Your Federation

By Astrid Kennedy, Executive Officer.



## Annual General Meeting

Your Federation held this year's AGM in the heart of grower land on the Sunshine Coast. HRDC Director Paul Ziebarth and AHC Executive Director Mark Napper attended and presented a view of the industry from an R & D and Marketing perspective.

Apart from being a statutory requirement, the AGM provides growers with the opportunity to hear at first hand how the Federation is spending levies, what activities it has been engaged in on growers' behalf and what plans have been formulated for the immediate and short term future. And just as importantly, it allows Federation Directors to discuss issues with growers other than their local colleagues thereby adding to their National focus. It was disappointing therefore that only eleven growers attended. A copy of the 1997/98 annual report is included with this issue of TA.

It was with regret that the Board accepted Mary Ravello's resignation from the position of Vice-President of the Federation. Mrs Ravello tendered her resignation from this busy position because of family commitments and will continue as a Director and Chair of the Marketing Forum. Frank Moore, Director and Immediate Past President of NSW Avocado Growers Association was elected unopposed.

A list of current Directors is given on page 2 of this magazine.

Membership of the Federation's committees and Directors' portfolio areas are listed below. These are your first points of contact when you want to receive or give information.

## Varieties Committee

Chairman	Rod Dalton
Directors	Mary Ravello Ross Richards
Nurserymen	Graham Anderson Peter Young
DPI Technical Advisers	Tony Whiley Ken Pegg
Registrar	Astrid Kennedy

## Code of Practice Steering Committee

Directors	Henry Kwaczynski George Green Geoff Betts
AAGF Executive Officer	Astrid Kennedy
AHC Industry Manager	Wayne Prowse
HRDC Industry Manager	Gerard McEvilly

## Research, Development and Extension Sub-Committee

Chairman	George Green
Director	Frank Moore
Consultant	Graeme Thomas
Grower/Consultant	Alan Blight
Growers	John Dorrian
AAGF Executive Officer	Astrid Kennedy
HRDC Industry Manager	Gerard McEvilly

## Marketing Forum

Chairperson	Mary Ravello
Director	Rod Dalton
Grower/Marketer	Ron Hansen
Grower/Exporter	Ron Simpson
Wholesaler (Brisbane)	Garry Poole
Wholesaler (Sydney)	Lindsay Tillbrook
Chain Stores	Barry Ross Jennifer Overland
Consumer	Astrid Kennedy
AHC Industry Manager	Wayne Prowse

## Directors' Portfolios

Export	Ross Richards
Californian Avocado Soc.	Ross Richards
World Council	Ross Richards
Market Research	Barry Daley
Statistics	Barry Daley
Industry Data	Barry Daley
Communications/ Talking Avocados	Frank Moore
Industry Advertising & Domestic Marketing	Mary Ravello
Product Handling	Henry Kwaczynski
Farm Management Practices	Geoff Betts
Quality Assurance	Wayne Franceschi

## General Meeting

The Board of your Federation stayed on the Sunshine Coast at the conclusion of the AGM for a general meeting held in the pleasant surroundings of Alexandra Headlands. Unfortunately a packed agenda prohibited the usual "on the coast" activities. **ANVAS Nurseries** The recommendation from the varieties committee that all four ANVAS nurseries remain accredited was accepted. The ANVAS nurseries are now inspected and samples taken twice annually and the Board extends its congratulations on the quality of the August results. Despite the "disease pressure" caused by unusually wet conditions—conditions ideal for fungal development—they passed the test.

**Talking Avocados** The subscription rate for Talking Avocados has been increased for 1999. The new rates are listed at the bottom of page 2. Prepaid subscribers will not have to pay the increase.

**AAGF Constitution** Past Federation Director, David Rankine, has redrafted

the Federation rules. Directors will discuss and consider the changes with their colleagues and report back by the end of December 1998. A second draft will then be prepared for Board discussion at the March meeting.

**AVOMAN** Firm expressions of interest to purchase the AVOMAN software package have been received from New Zealand, South Africa and California. Your Federation in conjunction with the HRDC and QDPI are preparing a proposal for New Zealand which, when accepted, will form the basis of the sale contract to the other countries. Revenue raised from local and international sales will be used for maintaining and upgrading the package.

**Multi-commodity R & D Group** This group, now known as Austhort R & D Group has identified three major issues for attention:

1. Improved labelling for Pesticides.
2. Horticulture environmental audit.
3. A coordinated response to the NRA existing chemical review, including immediate action for endosulfan.

Whilst all three proposed projects are important the third one concerns the avocado industry most at present. Essentially the proposed project will establish and fund from the collective kitty, worker exposure trials for endosulfan usage and collect data in a format acceptable to the NRA. I will update you on progress made in the March issue.

**Horticultural Industry Alliance** The funding proposal of 1 per cent of levies over two years has now been accepted by the Federation Board and by the vast majority of the other stakeholders. The HIA is scheduled to publish a green paper containing a series of options and recommendations in December 1998. A three-month consultation period has been allowed so I will be in a position to provide more details for you in the March issue. It is prudent to observe that to date this is industry's best opportunity to create and shape the service provider/s it needs.

**No Australian Conference for 1999** Directors agreed that a local conference in the same year as the World Congress could detract from both events. The proposal is that the next Australasian conference will be in 2001, in Australia and

hosted jointly by your Federation and New Zealand.

**World Congress – 1999** The organisers of the 1999 World Avocado Congress have changed the venue from that previously advertised.

The Congress will now be held at Urapan Michoacan, Mexico, on 17-22 October 1999. For further information, contact the AAGF Executive Officer or Dr Daniel Teliz Ortiz, Email <dteliz@colpos.mx>.

**World Congress 2003** For approximately four years now the international grapevine has said that 2003 is Australia's year for hosting the World Congress. Your Federation has held many heated debates on the pros and cons of hosting the

event and has now agreed that we should forego the opportunity and concentrate on local and Australasian events instead.

**R, D & E Sub-committee Meeting** The two-day event in Bundaberg at the end of October had a distinct international flavour. Avocado "gurus" exchanged information and ideas as they participated in the R & D meeting and studied the local field and chemical trials. Professor Carol Lovett (California), our own Dr Tony Whiley and almost local Dr Jonathan Cutting (New Zealand) joined the Sub-committee for a very productive meeting. Of particular interest was a comparison of current research, research methods,

funding and industry problems of the three countries present.

New Zealand and Australia have identified new areas for cooperation. In particular, with a proposed new project that may result from the recent retail survey—the results of which are published on page 14—and may attempt to follow fruit from tree to table to pin point the weak links in the chain.

A project brief is currently being prepared and will be considered by an Australasian review panel before it is issued to the research community.

*The Directors and the Executive Staff send season's greetings to you and your family and may 1999 be happy and prosperous.*

## TALKING AVOCADOS - HAVE YOUR SAY



Dear Sir

Thinking back to the time when I was going through the orchard with my wife Silvia, pencil and paper in hand, to record budbreak, flowering, signs of *Phytophthora* etc. for the construction of AVOMAN growth cycles, it was all worthwhile.

Having had AVOMAN installed for about six weeks now, I want to let you know that in our opinion this is the most wonderful program we can possibly imagine. It feels as though we have been working with it for years.

Silvia and I want to congratulate all the members of the AVOMAN team for the great job they have done. Not only the team but the avocado industry as a whole in this country should be proud to have such a wonderful tool on hand.

Once again, congratulations to the AVOMAN team.

Dieter Gort  
Twinhill Orchards  
Peachester Qld

Dear Sir,

Congratulations to the AVOMAN team. After six long years of development, hitches and glitches they have really produced the goods.

AVOMAN is a powerful management tool and an excellent record keeping system. The program uses comprehensive, up to date information and research from all over the world and helps you to customise it right down to each block on your farm.

AVOMAN is easy to use. You don't have to be a computer buff to find your way around. It comes with an excellent manual, simple to read and a breeze to use. In the manual are 23 tutorials. They teach you, step by step, how to find information, enter records, obtain recommendations, print

out spray diaries, and record your yield and prices for the year. You can use all of the features of the program or choose only the ones that suit you.

AVOMAN has the power to improve your production, your quality and your profitability.

If you haven't done so already, I think you should seriously consider buying the program. I'm glad I did. It's like having Tony Whiley and team on tap 24 hours a day.

Verna DeLai  
Tolga Qld

Dear Sir,

I read with interest your article on Avocado Maturity Standards in the 1997 June issue of "Talking Avocados".

Starting in April of this year and through to July, I have conducted dry matter testing for the Hass variety and also on a new variety which is very similar to Hass, but which matures 3 to 4 months earlier than Hass in Western Australia. The results of these tests are listed below:

	Hass	Llanos Hass
21 April	18 %	21 %
13 May	20 %	23 %
30 May	22 %	25 %
15 June	23 %	26 %
30 July	27 %	30 %

The above Hass would have been mature by the 30 May based on the 21% dry matter, whilst in fact Hass is only harvested in WA commencing around September. This, therefore, highlights the fact that 21% dry matter should not be used as the benchmark for all avocado varieties in Australia.

In California, there are different dry matter standards for the various avocado varieties, which brings into question the 21% standard in Australia.

As mentioned in your article, there are other factors to be considered in determining fruit maturity. Experience should now dictate at what time of the year various varieties mature. Timing of harvesting should be set, taking into consideration growing regions and climatic conditions.

Having a 21% dry matter for all varieties is really not an acceptable benchmark, as Hass does not reach an acceptable mature state until it has reached at least 23% to 25% dry matter.

Some of our readers may be asking what this new variety "Llanos Hass" is. Only an expert can tell the difference between this new variety and Hass. The skin, texture and colour are the same as Hass and the eating quality is as good as or even better than Hass, depending on one's tastes. Plant Breeder's Rights application of this new "Llanos Hass" has been accepted, and provisional protection received from the Department of Primary Industries & Energy, Canberra, Plant Breeder's Rights Australia. [*Llanos Hass are shown on the front cover of this magazine. Ed.*]

Anthony P Llanos  
Kwinana WA

### Avocado Makes the Guinness Book of Records

In 1992, Anthony Llanos was listed in the Guinness Book of Records as the grower of the largest avocado in recorded history, a 1.99 kg, 31 cm giant. The record stands today though there could be contenders in their orchard even today.

Mr Llanos is shown on the back cover of this magazine holding the world record avocado.



## Industry Manager's say .....

By Wayne Prowse



### Regional Consultation

In the last quarter I have had the pleasure of meeting with growers in their regions from Atherton Tablelands to Perth and Pemberton in WA. Where possible

I combine these visits with business for other industries that I work with to spread the travel costs more efficiently; however there are many benefits from these meetings.

Firstly they provide opportunities for me to discuss the issues and outcomes of the levy funded marketing programs. This then allows for open discussion to clarify the reasons behind the strategies. This is difficult to do in a column such as this.

Finally it gives me a better opportunity to understand the regional issues that may be addressed in a better way through modifying the programs. For example the proposed March merchandising program will not suit Western Australia so we are able to involve a service to Perth stores in January when the Western Australian Hass crop is still strong. However in Mareeba we identified opportunities for the March program to effectively link with the regional Shepard Australia promotion.

Also during this quarter I reported on the 1997-98 program at the AGM held at the Big Pineapple near Nambour. Again this was another opportunity to meet with growers mainly from the Sunshine Coast area. The written report is enclosed with this issue.

### New Marketing Forum Members

The Avocado Marketing Forum has two new members.

**Ron Hansen** will join the marketing forum and bring insights from the Western Australian market. Ron has served as a Director of AAGF until recently replaced by Wayne Franceschi as the Western Australian delegate. Ron's enthusiasm for maintaining an active role in the Western Australian elements of the national promotion program is well known and we welcome him to the marketing forum.

**Jennifer Overland** is no stranger to avocados having worked on the avocado promotions from the QFVG office in Melbourne until 1997. Now working as fresh promotions manager at Coles Head Office in Melbourne, Jennifer will bring a strong retail perspective to the forum.

The next meeting of the marketing forum will be held in February to review 1998 programs and plan for the 1999-2000 year. Anyone wishing to submit comments or suggestions is welcome to do so by writing to me at the address below.

### AHC on the move

After 10 years at 100 William Street our lease has expired and we moved offices on 27 November. Our new address is:

**Australian Horticultural Corporation  
Level 11  
51 Druitt Street  
SYDNEY NSW 2000**

The offices will provide slightly more space for our 16 people for similar cost. Our new lease is for two years and we will use the existing "fit out" to keep costs to a minimum pending the outcome of the Horticultural Industry Alliance (HIA) recommendations.

You are welcome to call in and see us if you are ever in Sydney.

### Market Statistics

We are now purchasing "HOMESCAN" data from research supplier AC Nielsen.

The benefits of this data is the measurement of a 5000 household sample of fresh produce consumers that relate statistically to the demographics of the total Australian population. By tracking the consumption of avocados we are able to measure:

- Total penetration of avocados into households by month and by State.
- The average time in between purchases of avocados.
- The percentage of 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> purchases of avocados in a period.
- Plus several other variables including prices paid etc.

Over time we will assist the marketing forum to effectively plan activities that work effectively by being able to more accurately measure the response to various promotions by State and period, the impact of strategies of various age groups etc.

### How do they work?

The consumer panels are co-ordinated by AC Nielsen to represent a population sample. Each member has a folder of special bar codes. After each shopping trip the panel member scans the bar code of the produce (eg avocados), the number purchased and price using a special wand. The information is then sent through a modem to the AC Nielsen computer and automatically collated.

Highlights from our first report show cumulative penetration in 16 weeks to 30 September as:

National	26.6%
NSW	27.1%
Vic	25.0%
Qld	31.2%
SA	23.8%
WA	18.9%

In future issues, I will expand on the information available. It should be interesting over a 12 month period.

### Perth Market analysis compared with Sydney

In other analysis, I have now received information from the Perth Market Authority that enables us to track the annual performance of fruit through the Perth market. This is different from the Sydney market that is reflective of east coast markets. By graphing the annual volumes by month on two scales so that they are comparable the differences between the markets are distinct. The graph on the next page highlights the need for a flexible strategy to take into consideration the needs of different States.

### Your Levy at Work October - December 1998

This period sees the completion of our main spring activity. The reducing supply coupled with strong demand for avocados in Summer season deems promotions to be less effective during the next few months. The Autumn program commences in late February with the arrival of the north Queensland greenskin crop.

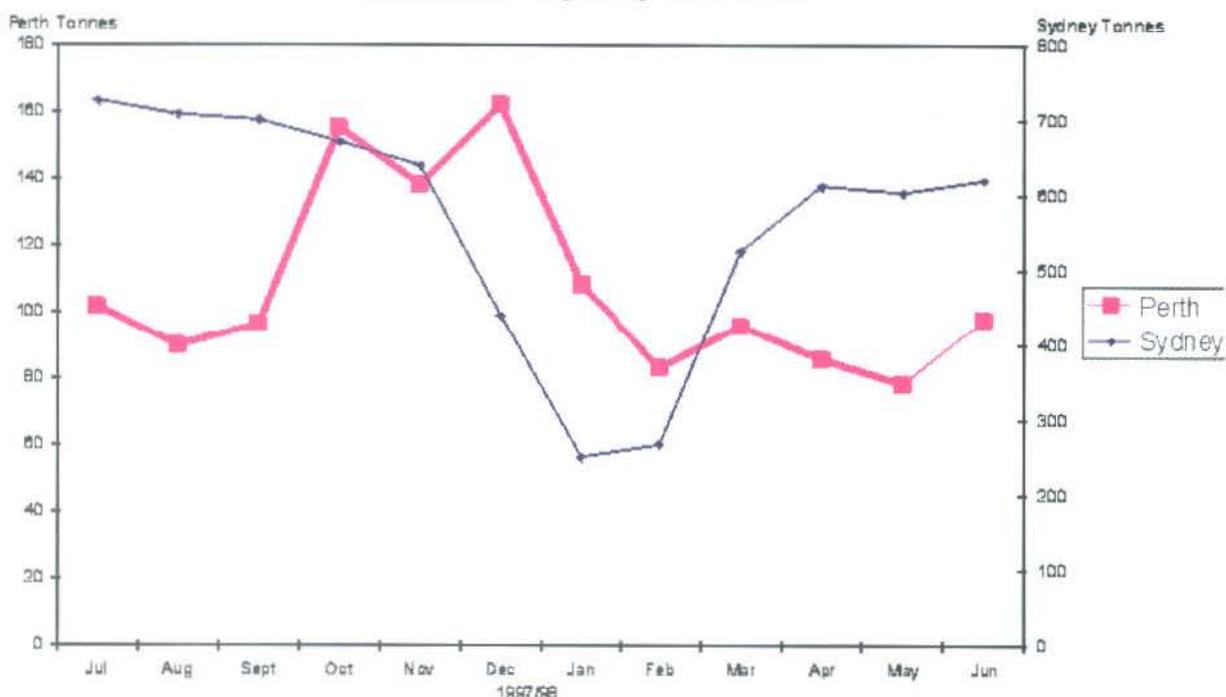
### Point of Sale material

- New Recipe leaflets are being distributed via demonstrators and retail chains.
- New retail Posters are being distributed to independent fruiterers (see next page).



# AUSTRALIAN HORTICULTURAL CORPORATION

## Avocado - Sydney vs Perth



(For more information contact Wayne Prowse 02 9339 1323)

### In Store Demonstrations

Avocado Industry in-store demonstrations conducted in October and November focussed on Hass varieties. The program continues to November (WA to December).

NSW	24 x 4 hrs
VIC	20 x 4 hrs
QLD	26 x 4 hrs
SA	36 x 4 hrs
WA	30 x 4 hrs

Next in store demonstration program starts in March 1999

### Merchandising

The next merchandising program is scheduled for March in all States except WA. We are arranging a special program in WA for January to suit local needs.

### Public Relations

- Avocado Recipes with Vikki Leng - September
- From tree tops to table tops (orchard and restaurant feature) - October

### Advertorials

*Bounty Magazines* - "Baby Care" and "Pregnancy" annuals - for distribution to

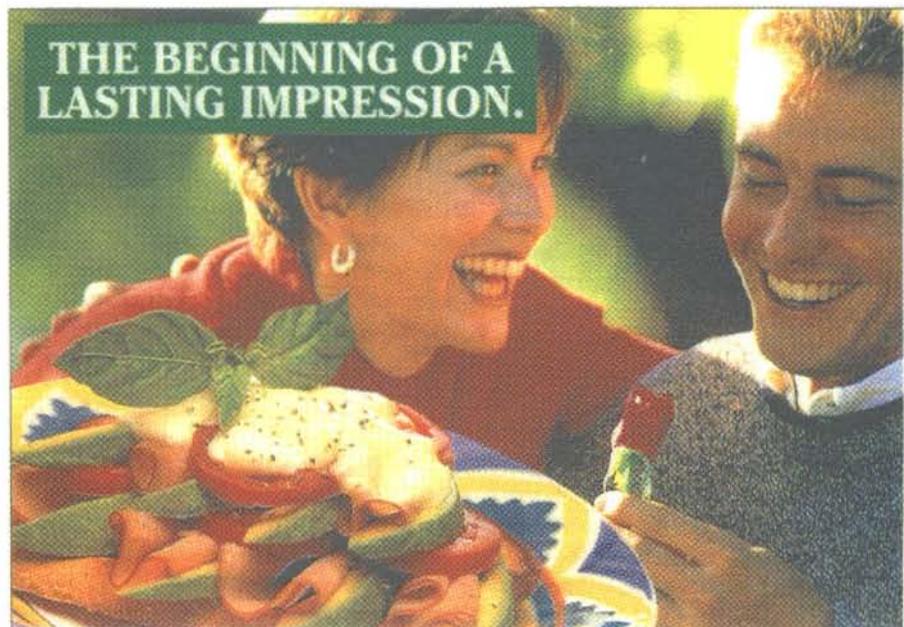
Maternity Hospitals - on going.

*HeartSmart journal* - September issue with recipes in addition to our advertorial commitment. Takes us to a double page spread in the magazine with an annual distribution of 130,000 health conscious people.

### Advertising

The final 1998 "spring" theme advertisements appeared in *Who Weekly* 4/10 and 11/10.

The next series of advertising is scheduled February - June.



**AVOCADOS**  
**REALLY MAKE A MEAL**  
*unique.*

This could be the start of a beautiful friendship. Because once you fall for the rich, creamy taste of avocados, it will stay with you forever. When the occasion calls for a lasting impression, avocados really make a meal unique.

And delicious!



**AUSTRALIAN**  
**AVOCADOS**  
DELICIOUS ON ANY OCCASION



JF&MVC2597NB

# Australian Round-up



## Sunshine Coast



The past quarter has proved to be a most interesting and sometimes confusing period for South East Queensland avocado growers. The AAGF's Annual General Meeting attracted a few interested growers, SCAGA's Canopy Management field day quite a lot more.

AVOMAN and AVOINFO were released to the growing public with little more than a whimper. The newly formed Horticulture Industry Alliance Steering Committee (HIASC) made a grab for a bucket full of growers' money to study the marriage of AHC and HRDC. In the meantime, QFVG has navel gazed with growers in its contemplations of the future of the Farm Produce Marketing Act—to PromptPay or to FarmPay, that is the question?

AAGF's AGM showcased the diligence and commitment of its members and supporting organisations to a small audience of growers. The Annual Report and other glossies that were tabled clearly demonstrated that the AAGF is aware of and is addressing the more pressing concerns of the industry. Interesting however, is the existence of out of session byplay which seems to focus on an informal agenda and through which some of the more unpalatable decisions are taken.

I am dismayed by the apparent pressures being applied by the chair in achieving outcomes contrary to the majority view. This undue pressure seemingly designed to achieve outcomes in favour of the political and not necessarily the industry's agenda.

One could be forgiven for suspecting that growers and regional grower bodies are no longer acknowledged as being sufficiently qualified to assess the merits or otherwise of bureaucracy driven initiatives or to determine research priorities for their industry.

R,D & E priorities, HIASC funding and the marketing merits of Hass over green-skins are issues of acute interest to growers and ought to be dealt with in a totally open and frank manner, immune from political pressure. Consultation is not just a word, it demands two way intercourse and growers have only themselves to blame if they accept lip service in lieu of legitimate discussion. Do we want to spend up to \$0.5m to

decide whether or not AHC and HRDC should amalgamate? Why did we contribute dollar for dollar to the development of AVOMAN/AVOINFO to end up with 1% ownership of the final commercial product?

Following many years of research, development and invention, AVOMAN burst forth to be quickly followed by AVOINFO. There is no question that these tools are a valuable extension to the grower's artillery. The smaller or computer illiterate grower may question its overall value but there is scarcely an on-farm issue that is not addressed in this very user-friendly software. The development team deserves the kudos that followed its release and it is disappointing to hear that to date the level of acceptance of this management and recording vehicle has been slow. This technology is not just a buzzword, if you don't get on the vehicles of its dispersal you will be left behind in the dust of change.

MHRS made a valiant attempt to give value for money to the 134 growers that attended the QDPI/SCAGA Canopy Management Field Day on October 7, but it was evident that very little preparation and equally as little new data was involved. Despite the intense interest shown in developing canopy management techniques speakers were not prepared to discuss the results of trials or the methods by which they were achieved.

The non-viability of under-tree use of Phosphonate was proved; however, foliar application under balanced pH conditions suffered a similar fate to that of pruning. By way of consolation it was ultimately announced that registration for use in approved applications had been given to 400-strength phosphonate. It is subsequently understood that QDPI have sought off-label approval for ongoing trials of foliar application of this chemical.

There is no doubt that AHC has produced some excellent marketing outcomes for our industry and HRDC has been similarly successful in progressing R,D & E priorities as set by AAGF. The case for their amalgamation/affiliation/alliance has been tossed around for some years now and there must be a mountain of paper collecting dust in a corner somewhere.

Perhaps the newly formed but budgetless HIASC should spend some time dusting off these papers before hitting the road in an all expenses paid fact finding safari. The

impression that growers are serving the wants of the bureaucracies established to serve them, persists.

Having championed a review of the Primary Producer Organisation Marketing and Farm Marketing Organisation Acts (outcomes of this review are awaiting Governmental pleasure), QFVG has embarked on the restructuring of the Farm Produce Marketing Act. The deregulation of this act seems inevitable and like NSW and Victoria the question of agent fidelity must be addressed.

Despite extensive promotion, PromptPay has failed to attract majority support from agent or grower. FarmPay has been better received but appears to be less effective in assuring returns to farms. Growers can only hope that QFVG will act strictly in the interest of growers and demand that agents warrant their own integrity just as farmers must warrant product integrity.

There has been no intention to appear negative about the progress of our industry but the reality is that we seem to be contributing a significant amount of our hard-earned funds to 'change for change sake' rather than the advancement of the industry. Ahead of us lies the increasing demand for food production traceability and producer responsibility. Growers must accept that on farm practices will come under ever increasing scrutiny. They must also expect that imminent changes in chemical use laws will require imaginative and practical solutions.

Similarly transparency, responsiveness, imagination and accountability can and should be demanded from those bodies whose reason for being hinges solely on the survival of horticulture industries.

In order to encourage growers to recognise and accept these facts of farming, SCAGA has planned a highly informative Christmas function in conjunction with its December QGM.

Representatives from all areas of the industry have been invited to attend and mingle with growers throughout the afternoon and evening. Our guest speaker will be Ms Margie Milgate, QFVG's Marketing Development Officer and Quality Assurance spokesperson. Members will be invited to register their intentions in the December issue of the SCAGA Newsletter.

## West Moreton

As reported last issue, a mild winter and warm spring had provided good conditions for flowering and fruit set. Unfortunately a cold snap in the middle of flowering along the range, Toowoomba to Hampton, has resulted in a poor final fruit set in most orchards, with a high percentage of "cocktail" Hass. Most other growers are reporting an average or better fruit set. Although the summer to date has been mild, it has stayed dry, so final crop yield predictions are at this stage premature.

The spray application workshop on 4 September was well attended and growers were able to evaluate and compare three quite different spray rigs.

Quite a few local growers attended the "Canopy Management and Tree Health Workshop" on the Sunshine Coast in October. This proved to be a very interesting and informative day, which was very well attended. Our thanks to SCAGA and Dr Tony Whiley for bringing it all together.



Christmas is upon us again! Most growers will have finished picking for the year. Generally, I believe, prices and volume

have been down this year. Fruit set in my area north of Coffs Harbour is quite promising for 1999—let's hope the January fruit drop doesn't change this view.

Legislative pressure continues to build on the farming community and with it the ever-increasing burden of costs. For example the moratorium on shooting fruit bats, while now conditionally lifted has cost stone fruit, banana and other commodity growers several million dollars this year. Fortunately, avocado growers are not affected but it must be remembered that many avocado growers also are producers of crops attractive to fruit bats.

Other problems that must be now faced, the wish to develop our property or change the rise or function of part of it, lie in the Native Vegetation Act and the Threatened Species Act administered by the DLWC and NPWS respectively. Previously unprotected flora such as native grasses (e.g. bracken fern and bladey grass) are now covered by the Act. In their own interest, any grower wishing to carry out clearing should consult with these departments for proper advice in the light of these new regulations.

A new Food Act has just passed through NSW parliament. While the Food Production (Safety) Act will initially apply to dairy fish and meat products, in the future there is the probability that it will be

extended to fresh produce and therefore horticulture.

So many changes and I haven't mentioned the irrigation question that is unresolved and ongoing. With all that is happening on the legislative/regulatory front it is even more important that you, as growers, support your local organisations. The AAGF lobbies government on your behalf on a wide range of industry issues. You give their effort more credibility through membership of a local branch.

On a different note, I must remind all growers that June 1999 is the deadline for Farm Chemical Handling Accreditation. After this date only persons with valid accreditation will be able to purchase Endosulfan. The list of chemicals so restricted will grow quickly so in your own interest make sure you have accreditation.

The Coffs Harbour Branch is planning a 3-4 day bus trip to the Sunshine Coast/Bundaberg area. Major growers, nurseries and packhouses will be visited. The trip should be interesting and informative. A date has not been set but early March 1999 is favoured. Anyone interested should contact Andrew Wright, Ph 02 6653 6087.

As advised in the September issue there will be no NSW Avocado Association Xmas function this year. Instead a major field day, with some interesting and different speakers and demo's followed by a dinner in the evening, is planned for April/May 1999.

In conclusion, the NSW Committee and I wish you all a very Merry Christmas and a Happy New Year.



Promotional activities in Western Australia have been very busy. They include the Royal Show, which targets a wide range of people and would have to be by far our biggest promotional activity.

Growers from all areas attended, to make dip or promote avocados to the public. A professional arranged the avocado display and what a difference, it has never looked so great.

In-store demonstrations are currently under way and so far 30 demonstrations have been completed with a further 30 still to be done by the end of November.

Avocados in the classroom project was run through August, in which 6 schools with a total of 27 classes and some 490 students prepared and sampled avocados.

The SQF 2000 generic plan has been audited and is currently at the printers and will be available soon (see page 16). We hope that by the end of the year several orchards will be SQF 2000 Certified.

Shane Mulo and Christine Bezzina held AVOMAN training over two days at Bunbury. Growers from as far as Carnarvon attended and the training was very rewarding, especially the lollies.

Robert Battaglia held a workshop on spray calibration. The morning session was for Agri Business and we had quite a few representatives, from machinery salesmen to people from Farm Care, who carry out chemical accreditation courses.

Growers arrived after lunch for their turn, in which they got to calibrate the different types of sprayers. Once this was done fluorescent dye was sprayed and the different methods of application were observed. This was a rewarding and fun day for all, which was topped off with a BBQ and night walk through the orchard.

At the field day we were given a kit which contains the equipment necessary to calibrate your spray units. Anybody who wishes to use it can contact Wayne Franceschi on 08 97761332 for more information.

## Seasonal Variations



Without any obvious differences between 1996 and 1997, my Hass crop dropped from 3,000 to 63 trays. Many similar crops have indicated it was now the year

to reform our trees. Fifty-four growers attended a Field Day where guest speakers Peter Young and Kevin Heritage of Chiquita demonstrated that there was much reforming necessary. Light stopped play.

## Salt/Lime Tolerant Rootstock

This week we have planted the cloned rootstocks which have some historical background as likely candidates. Now we wait for some years to measure their characteristics to identify the best selections.

## Royal Adelaide Show

Colin Fechner, our State secretary, has taken over the running of our exhibit at the Royal Show, which is why we set another record (avocado sales of \$16,000 and third prize in the Horticultural Exhibits). Our thanks go to all our members, their families and friends, who spent from 1 to 11 days in Adelaide working very hard indeed. No wonder we set a new record with Colin's home-made port as an additional "workers incentive". Our thanks also go to Diana Tucker and Chiquita's demonstration team.

## Isozyme Time

Our Malaysian post graduate student is now equipped with a well-earned M.Ag.Sc. His mentor is most impressed with the work, which is "eye opening" and indicates room for further research. We will receive copy of his thesis and then discuss what comes next.



## Rebates, Information And Training

### Rebates On Sale Price Of AVOMAN

#### Queensland

Growers can apply for a 75% rebate on the training component of the AVOMAN software price. This component includes the cost of the two-day instruction course and the user's manual, which together make up \$140 of the \$250 purchase price. Thus the rebate is worth \$105. To be eligible growers need to demonstrate that most of their income is derived from the land and that most of their time and effort is spent in farming activities.

To obtain the application form and guidelines, contact Mr Bill Russell at:  
Queensland Rural Adjustment Authority  
GPO Box 211  
BRISBANE QLD 4001  
Phone: 07 33700159

Fax: 07 33700180

This scheme is about to be replaced with a new one so be quick in case the rules change.

#### West Australia

Growers may be eligible for a 50% rebate on the training (instruction and manual) component of the sale price through a State government scheme. Contact team member Alec McCarthy at the Bunbury Agriculture WA office for application forms and details.

#### NSW

No rebate is currently available but a new scheme is due to be released soon which may offer some assistance. Keep in touch with team members Greig Ireland or John Dirou at the Coffs Harbour and Alstonville NSW Agriculture offices respectively.

### AVOMAN Web Site And Newsletter

In order to keep AVOMAN users in touch with the latest news and information, an AVOMAN web site is being prepared for those with access to the Internet and a newsletter for those without. Users will be kept up to date with tips, details about bugs, news about software updates,

All AVOMAN and other technical articles and reports published in this magazine are sponsored by the HRDC and the avocado industry.



At one of the Alstonville sessions Graeme and Lorraine Moore and Richard Bennett get some instruction from Shane Mulo. John Dirou is looking on.



A diligent group at the Sunshine Coast University gets stuck into a tutorial.



Ursula Starkovsky, Dieter and Sylvia Gort and Ted Tree get assistance from Christine Bezzina at one of the Sunshine Coast training sessions.



Wayne and Jennie Franceschi from Pemberton WA learn about the finer points at the training in Bunbury.



forthcoming RPG activities and so on. Growers will also be encouraged to have their say. Look out for the first issue of the newsletter soon.

## AVOMAN Training

The scheduled two-day training sessions around the country are now complete. Thirteen separate sessions were conducted over a period of ten weeks covering the country from Mareeba in North

Queensland, to Coffs Harbour in NSW, Mildura in Victoria, Berri in South Australia and Bunbury in West Australia.

Age and distance proved no barrier, growers from as far a field as Bairnsdale in East Gippsland (Caroline and Roger Bilney) and Carnarvon in West Australia (Keith Collier) motored over 9 hours to attend and ages of those attending ranged from 10 to over 80, we feel honoured!

Two or more team members delivered the training in each growing region and over 150 growers attended in total.

For growers who could not make it to one of the scheduled training sessions or who would like further training, please contact your local team member. It is envisaged that short sessions may be held on a local level if sufficient people register their interest. In the meantime remember the manual is very user friendly and that the tutorials (Chapter 8 of the manual) will take you one step at a time through most operations. Also, don't forget to check the yellow hint bar on the screen and use the help files especially via the help key on your keyboard (F1).

## AVOMAN Tips

### Short cut for date entry

Rather than using the calendar icon to change or select a date in AVOMAN did you know you could type over the top of a date when it is highlighted?



Figure 1: A date entry point in AVOMAN with the date highlighted.

This will save you time and is particularly helpful when you are entering multiple entries, e.g. weather data. When you press the "+" button (on the navigator bar) today's date will be automatically entered and whilst it is still highlighted you can type the desired date over the top. You can use a short format too when typing it in (e.g. 2/6/98 instead of 02/06/1998).

There is only one place you can't use this short cut method and that is on the main toolbar.

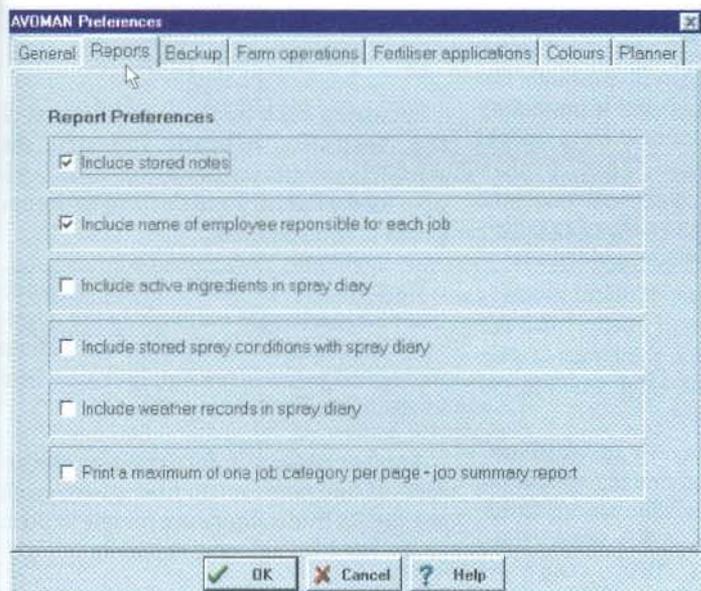


Figure 2: The reports page in Options/Preferences where you can specify details about your reports.

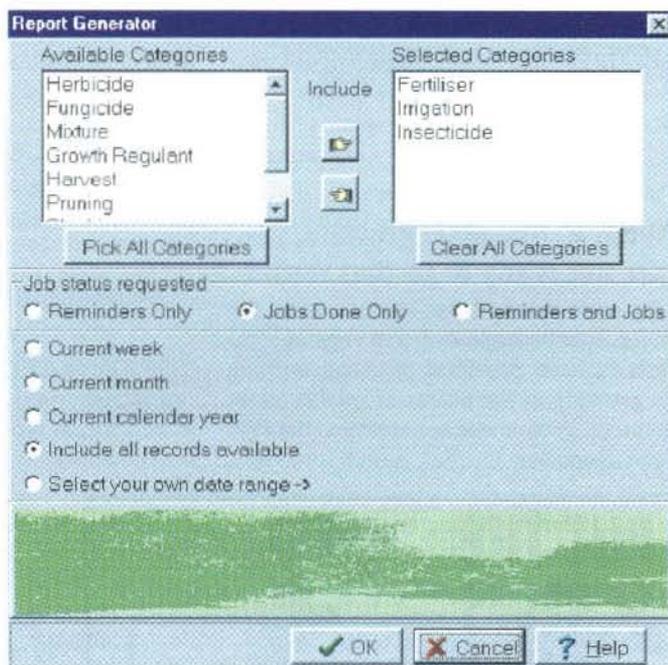


Figure 3: A typical "Report Generator" screen where you can further customise details about a report.

### Customising Reports

What appears on your printed reports can be customised in two ways. Firstly in Options/Preferences/Reports you can select the details you would like to appear such as notes you may have written with the job, the name of the employee you may have assigned to do the job and the spray conditions recorded at the time.

The other area where you can customise your reports is in the "Report Generator" screen that appears when you select a particular report (e.g. from the operations screen).

The "Report Generator" allows you to select certain details about the report such as the categories of jobs you want on the report, the status of the jobs (i.e. reminders, jobs already done or both) and the date range you want reported. The options that appear on the "Report Generator" will vary to suit the report you select.



# HRDC Report

By Gerard McEvilly, Avocado Industry Manager

The recent publication of the HRDC HortReport [a copy is enclosed with this magazine] is a timely reminder that there are some real benefits in looking outside the industry you are involved in for new ideas. We have tried to feature projects that have potential application to more than one crop and that show the wide scope of work funded by HRDC.

Good examples of learning across industries are found in the Quality Management area, covered in other articles in this issue.

A group of West Australian growers took the SQF2000 system developed by table grape growers and, with some effort and a little HRDC funding, adapted it to suit their own enterprises. With some further adaptation, as Dave Duncan explains, it can help other avocado growers achieve SQF2000.

### What if, like most growers, you are not ready to go that route?

Projects funded by HRDC with the melon, mango stone fruit and vegetable industries have provided practical training for growers in the basics of quality management. From these has emerged the Produce Supplier Guide, which provides

guidance on developing an approved supplier program. The guide includes a checklist of growing and handling practices which commercial packers, marketing groups, wholesalers, exporters and processors may require of growers to become an approved supplier.

Implementation of these practices will provide a first step towards a recognised quality management system such as SQF2000. The developers of the guide have consulted widely with all industry sectors, including the retail chains, and are currently amending the draft publication to incorporate the industry feedback. It is expected to be released by late January.

There still exists a deal of confusion about Quality issues and the HRDC publication "The Competitive Edge" explains the various options and provides case studies from a range of industries where we have provided support.

### The promotion of health claims in food

On a quite different matter, a number of industries, including avocados, have joined forces with HRDC to help fund a major research study into the promotion of health claims in food.

There are currently very strict rules about claiming specific health benefits.

The pilot study, organised by the Australia and New Zealand Food Authority (ANZFA) will promote the benefits of folate in protecting unborn babies from spinal disorders. This highly targetted study will assess the benefits and risks of changing the advertising guidelines.

Some issues affect virtually the whole of horticulture and it can be a challenge to gain consensus (and funding) to tackle these.

There is now an "AusHort" R&D committee, which the industries have set up to address this. A key issue identified at this stage is Endosulphan, along with the other pesticides listed for review by NRA. A project is

being commissioned to provide the additional data required by NRA and this will also help as other pesticides move through the review system.

Other AusHort projects are; an environmental audit for horticulture, to provide better industry knowledge about any positive or negative impacts that it may have, and market development through market access and disinfestation methods.

### Links with avocado industries in other countries

Apart from sharing information and resources with other industries in Australia, the avocado program is developing links with avocado industries in other countries.

With Prof Carol Lovatt from California and Jonathan Cutting from New Zealand at the recent avocado R,D&E committee meeting, a comparison of notes resulted in the Table on the next page. It is hoped to build on and update this information and include other producing countries in future.

We are trying to become aware of our relative research strengths and weaknesses and avoid "reinventing wheels", while recognising that new technologies often need adaptation for the very different growing conditions in each country.

### R,D&E plan

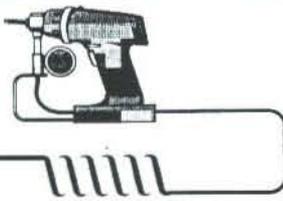
Focussing back on the specific needs of the Australian avocado industry, the AAGF Board has ratified a revised R,D&E plan for the industry and this will be used to guide future spending.

Projects are generally to be commissioned and a brief is currently being developed for a project to identify and address the critical points in the supply chain where avocado quality is being affected.

Another project is focussing on the effects of tree nutrition on fruit quality, with the results from a literature review to point to the need for any new research.

*The article on this page is sponsored by HRDC and the avocado industry.*

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Issue	Australia	New Zealand	California
<b>Funding</b>	<ul style="list-style-type: none"> <li>• Statutory national levy of 8c/tray (\$13.33/tonne) for R&amp;D. Also 16c promotion levy of which 10% goes to national body AAGF. State/local associations supported by subs or State levies.</li> <li>• R&amp;D funds matched through HRDC, providing \$300k in 1996-97, \$500k in 1999-2000.</li> </ul>	<ul style="list-style-type: none"> <li>• 3% levy funds NZAGA, which with Hort Exporters Assoc, forms Avo Industry Council. AIC collects levies on export fruit of 50¢/tray plus 10¢/tray from exporters (\$700,000) Promotion was \$68k in 1997-98 (\$155k in 1998-99). R&amp;D funding in 1996-97 was \$112,500 out of total \$227,500. (\$260k in 1998-99) Aims for 2:1 or 1:1 matching.</li> </ul>	<ul style="list-style-type: none"> <li>• \$500,000 R&amp;D funding from grower levy.</li> <li>• Other levies fund Californian Avocado Commission activities including promotion.</li> <li>• All growers are members of Californian Avocado Society.</li> <li>• Also Californian Avocado Development Association.</li> </ul>
<b>R&amp;D Planning, management, priorities</b>	<ul style="list-style-type: none"> <li>• AAGF Strategic Plan 96-2000, R,D&amp;E plan 1996-2000 (audit each 2 yr, review each 4 yr).</li> <li>• Gerard McEvilly p/t Program Manager through HRDC, plus other HRDC input.</li> <li>• AAGF R,D&amp;E committee chaired by George Green. Secretariat Astrid Kennedy.</li> <li>• Current priorities on-farm includes prevention of postharvest rots. Major past investment in tech transfer through AVOMAN.</li> <li>• Improved quality of ripe fruit is future priority.</li> <li>• Consider concept proposals, but mainly advertised/targetted commissioning.</li> </ul>	<ul style="list-style-type: none"> <li>• Industry Strategic plan to 2006 (Aug 97).</li> <li>• Jonathan Cutting employed as Industry Manager.</li> <li>• Current focus is postharvest, plus work on IPM towards Avo-Green. Some work on human nutrition. Major packaging research undertaken in 1998-99.</li> <li>• Managed by targetted commissioning of research providers.</li> </ul>	<ul style="list-style-type: none"> <li>• No overall research plan, but priorities developed annually based on detailed grower survey.</li> <li>• Len Francis part-time Research coordinator.</li> <li>• R&amp;D committee has 8 members from CAC and 7 members from CAS.</li> <li>• Focussed on production, particularly thrips and screening of germplasm from Bob Berg breeding program. Seeking rootstocks &amp; scions to widen production zone.</li> <li>• Manage by screening submissions in response to priority list. Introduced world-wide call for proposals in 1998.</li> </ul>
<b>Research base/strengths/gaps/resources</b>	<ul style="list-style-type: none"> <li>• QDPI has majority of avocado technical R&amp;D expertise. Full use not yet made of other agencies covering technical and other R&amp;D.</li> <li>• Development of young researchers is left to agencies.</li> <li>• Current strengths in physiology/agronomy, postharvest and pathology.</li> <li>• Weaknesses in industry statistics/forecasting.</li> </ul>	<ul style="list-style-type: none"> <li>• Hort+Research provides most R&amp;D expertise.</li> <li>• No industry extension program in place.</li> <li>• Pay full recovery cost of research with no government contribution.</li> <li>• Current strengths in: postharvest handling, packaging, IPM/AvoGreen, Stats/forecasting.</li> <li>• Weaknesses: production systems.</li> </ul>	<ul style="list-style-type: none"> <li>• University of California Riverside is primary provider of avocado R&amp;D expertise.</li> </ul>
<b>Market Focus</b>	<ul style="list-style-type: none"> <li>• Primarily domestic, where usage is low.</li> </ul>	<ul style="list-style-type: none"> <li>• Primarily export (608k trays to export most to Australia, 50k trays to California 1997-98).</li> <li>• Expect 700-750k export trays 1998-99 season.</li> </ul>	<ul style="list-style-type: none"> <li>• Domestic sales account for 90% of sales.</li> <li>• 20% of crop is processed.</li> <li>• Significant imports, particularly from Mexico.</li> </ul>
<b>Industry snapshot</b>	<ul style="list-style-type: none"> <li>• 20,000t/3.5m trays valued at A\$50m.</li> <li>• 740,000 trees.</li> <li>• 1300 growers.</li> </ul>	<ul style="list-style-type: none"> <li>• 1.1m trays in 1997-98, 1.2-1.25m trays in 1998-99.</li> <li>• 60,000 mature trees, 130,000 new trees in past 3 years.</li> <li>• 600 growers.</li> <li>• Forecast 3-3.5m trays, 18000t, 1800ha, 450 growers by 2006.</li> </ul>	<ul style="list-style-type: none"> <li>• 6000 growers, 24,000 ha (bearing) 203ha (non-bearing), producing 150,000 tonnes (329m pounds).</li> <li>• Value (1996-97) US\$259million.</li> </ul>
<b>Varieties/rootstocks</b>	<ul style="list-style-type: none"> <li>• Primarily Hass on seedling rootstocks.</li> <li>• Nursery accreditation scheme is operating.</li> </ul>	<ul style="list-style-type: none"> <li>• Hass.</li> <li>• Rootstock seedling Zutano.</li> <li>• Nursery scheme operating (Colin Partridge is coordinator).</li> </ul>	<ul style="list-style-type: none"> <li>• Hass.</li> </ul>
<b>Information management</b>	<ul style="list-style-type: none"> <li>• Talking Avocados (quarterly)</li> <li>• AVOMAN and AVOINFO.</li> <li>• Agrilink.</li> <li>• Regional productivity groups.</li> <li>• Biennial conference.</li> <li>• Occasional field days.</li> </ul>	<ul style="list-style-type: none"> <li>• Avo Scene (AGA quarterly magazine).</li> <li>• The Orchardist (monthly).</li> <li>• Annual grower (1-day) conference.</li> <li>• 2x annual packing shed workshops.</li> </ul>	<ul style="list-style-type: none"> <li>• All researchers expected to interact with growers individually and at meetings.</li> <li>• Spring research meeting for presentation to growers.</li> <li>• Numerous other workshops/field days covering northern and southern industries.</li> <li>• Publications include SubTropical News (Ed. Mary-Lu Arpaia), Californian Avocado Society Yearbook, Avocado Quarterly, Californian Farmer, Citrograph and grower newsletters from local associations.</li> </ul>

# Internal Quality Still A Big Issue

By A. Story and A. Fuss, *Story Horticultural Services, Toowoomba Qld*

A survey of 49 retail outlets across Brisbane and Sydney was undertaken during September, 1998, as a follow-up monitoring exercise of the internal quality of Hass avocados available to Australian consumers. Previous surveys undertaken as part of the project "Improving the Management of Avocado Quality during Marketing" were used with respect to methodology and for comparative purposes.

During the period of the project, the methods used in handling avocados shifted to incorporate more widely the use of controlled ripening as a tool to improve internal quality and provide consumers with a fruit that was at the desired stage of ripeness.

Avocado purchases were seen to be a high-risk purchase with 50 to 60% of purchases displaying some form of internal defects. This year's survey was to check whether this still remained the case and to qualify internal defects that were of concern to the avocado industry.

Suburbs surveyed were selected according to socio-economic groupings, with three retail outlets sampled per suburb (where possible a supermarket, a fruit barn and an independent fruiterer). Five different supermarket chains were surveyed in Brisbane and three in Sydney.

At each retail outlet, 20 ripe or sprung fruit were purchased as representative of fruit on display. Avocados that appeared sound and likely to be purchased by a consumer were selected. In most instances, fruit samples were sourced from the retailer's stock so as to gain information on the supplier (grower/packer) and minimise consumer selection bruising. If no stock was on hand, avocados were sampled from the retail display.

Details of the display position in the retail outlet, the fruit history, the brand, the packer and the grower were noted if available. Notes were also made on the purchased fruit's size, class and price. Where possible, the pulp temperature of the fruit was recorded at the time of purchase.

All ripe fruit were cut within 24 hours of purchase (and in the main within 12 hours) whereas sprung fruit were held under ambient conditions (up to 48 hours) until judged eating ripe. The ripeness of each fruit was determined by its firmness. Ripe fruit were cut into thin wedges to assess their internal quality.

The form, incidence and severity of any defects were recorded. The severity was divided into 4 categories: slight, mild, moderate and severe, with category guidelines provided for each defect. An overall rating of acceptability was recorded for each fruit. A fruit was rated as unacceptable if a moderate or severe defect was present, and as having minor defects if those defects present were slight or mild.

Photographs were taken of examples of major or severe internal quality defects in both Sydney and Brisbane or to support patterns observed in some of the defects.

## What was Found

Hass avocados remain a high-risk purchase with an unacceptably high level of internal quality defects, irrespective of the category of retail outlet from which they were purchased. The proportion of defect free fruit available at point of sale in both Brisbane and Sydney was around 10% lower than in 1997. No fruit lot sampled over the two cities was 100% free of internal quality defects.

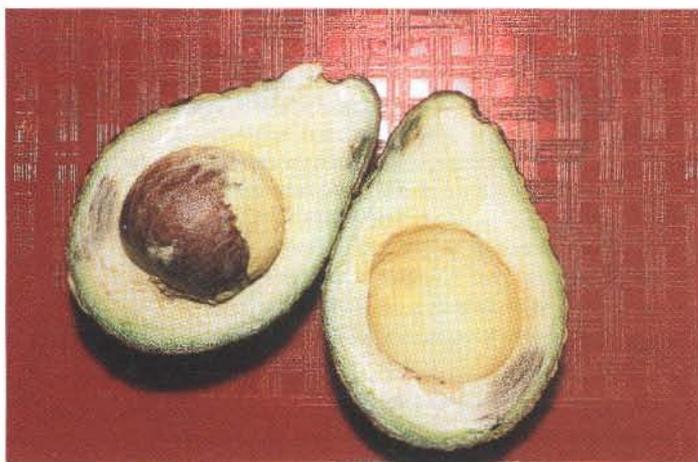
Sourcing policies of different retail outlet categories appear to be impacting on the extent of internal defects at the time the avocado is presented for sale. With fruiterers and fruit barns continuing to favour sourcing of green (unripe) fruit, supermarkets have embraced control-ripened fruit. In some instances, fruit on display at some of the supermarkets have bordered on being over-ripe which may be linked to a preference by the supermarket's buyer.

## Bruising

Bruising, as depicted in the photographs on this page, was the main quality defect. Whilst the extent of fruit showing bruising has fallen slightly on 1997 levels, over 30% of fruit surveyed across all retail outlet categories were afflicted with this defect. The pattern of bruising observed in the 1997 survey was once again strongly evident. Of those fruit with bruising, 56% in Sydney and 65%

in Brisbane, showed it to be all or in part at the base of the fruit at an angle consistent with the point of contact of the fruit with the base of the tray insert.

Supermarkets had approximately one third of their fruit offered for sale in a bruised condition (33.5% in Sydney and 31.7% in Brisbane). However, there was a big difference in the amount of bruising on fruit offered by different chains. In Brisbane, chains 2 (52.5%) and 4 (70%) had high levels of bruising and approximately half the fruit affected were bruised to the extent that the fruit was deemed unacceptable. Chain No. 3 had the lowest incidence of bruising (7.5%) and most of this was considered slight to mild in nature.



# Australian Avocado Growers' Federation Inc

## Annual Report 1997- 98

*By Rod Dalton, President*

The vast majority of avocado growers rely on the insecticide endosulfan to enable them to produce a marketable product. When the NRA threatened to ban endosulfan they threatened the viability of the industry.

Your Federation responded to the challenge and demonstrated its ability to successfully research, coordinate, communicate, lobby and negotiate its way to a favourable outcome for the industry. Endosulfan will continue to be available to growers provided the industry supplies worker exposure data and growers use the product responsibly.

The R, D & E plan and program underwent a comprehensive audit during the year and was found wanting in that it concentrated on on-farm problems rather than consumer requirements. The plan has been re-focused and resources allocated to assist with the management of subcommittee activities.

The industry strategic plan was refreshed. Completed projects were updated, deadlines revised and a general realignment was made to meet the needs of a growing industry.

The Federation Executive was actively involved in the restructuring process of our service providers, the AHC and HRDC, and in deliberations relating to the establishment of a Peak Industry Body for Horticulture.

A steering committee was established, of which I am a member, to drive the restructuring process known as the Horticulture Industry Alliance and was given the task of creating an efficient, responsive service-providing organisation that meets the needs of horticulture. This is a long awaited opportunity for industry to create the structure it wants and needs, rather than make do with two organisations handed down ten years ago by a well meaning government.

The Federation has had a busy and eventful year and, in following the standard set over the last few years, I have kept this report brief and focused and attempted to provide you with a succinct account of the work undertaken on your behalf.

### Finance

#### General

The Federation's consolidated financial position remains healthy with total assets in the region of \$140,000.

Consolidated profit for the year, including the surplus from Conference '97, was \$18,507. Reserves are in place for contingencies and each committee or subcommittee is sharing administration costs as well as funding its specific activities.

#### 1998/99 Budget

The Budget for the financial year 1998/99 follows the style adopted last year and lists items under function headings rather than individually.

The Federation has taken over responsibility from the AHC for the industry magazine "Talking Avocados". Funds are sourced from the Marketing and R & D Levies for this project and the expenditure is included in Communications.

Income	\$
Levy Contribution - AHC	47,600
Talking Avocados	28,900
Sundry Sales	500
Interest	2,500
Membership	3,720
<b>Total Income</b>	<b>83,220</b>

Expenditure	\$
Secretariat	36,000
Communications	30,250
Meetings	14,000
Dept of Consumer Affairs	250
Bank charges and fees	250
Contingencies	2,470
<b>Total Expenditure</b>	<b>83,220</b>

### Committee Reports

#### Varieties Committee

The varieties committee lost a very valuable member during the year when Mr Alec Kidd OAM retired. Mr Kidd was a founding member of the committee and his knowledge will be sorely missed. This committee oversees ANVAS and the registered tree scheme. It meets when required and continues to work efficiently.

## R, D & E Sub-Committee

The committee welcomed Mr Frank Moore, Federation director, and Mr Alan Blight from WA as new members during the year. In keeping with our commitment to form closer working relations with New Zealand, Dr Jonathan Cutting is invited to attend R & D meetings where appropriate.

The HRDC has established a cross-commodity reference group to develop policy guidelines for multi-industry R & D projects. Andrew Pearce, the Macadamia industry R & D Chairman, represents avocados on the group.

### Achievements

1. Eight projects new or continuing were funded from levies, one brief was issued and the farm management software packages AVOMAN and AVOINFO were completed and were due for release in August 1998;
2. Grower networks were developed to support the fruit spotting bug project and for AVOMAN training;
3. A review/audit of the R, D & E plan has been completed;
4. Closer links have been developed with overseas avocado industries through the successful combined conference in New Zealand in September 1998;
5. The commencement of a contingency plan for exotic pest and disease incursion.

### Current Projects funded by levies

- AV96004 - Avocado canopy health and management (Dr Tony Whaley)
  - AV96005 - Managing avocado irrigation for yield and fruit quality (Dr David Turner)
  - AV97001 - Field management of avocado post harvest diseases (Dr Lindy Coates)
  - HG97010 - Ecology and behaviour of fruit spotting bugs (Dr Geoff Waite)
  - HG97011 - Improving pesticide application in large canopy trees (Mr Robert Battaglia)
  - AV98008 - An analysis of the risks of exotic pests and diseases to Australia's avocado industry (Dr Ian Muirhead)
  - AV98000 - Funding AAGF R & D Committee
  - AV97003 - Technology Transfer through Talking Avocados
- **Projects completed during the year.**

Two projects were completed - AVOMAN/AVOINFO and Boron Nutrition - a project supported by Sunshine Coast growers.

• **Project Briefs issued.**

It was recognised that avocado growers do not have the data available with which to consistently optimise yield and quality to consumer requirements. The Sub-committee issued a brief seeking expressions of interest to conduct a project to overcome the lack of data on optimising tree nutrition to maximise fruit quality.

The overall aim of the proposed project will be to maximise the production of avocados with high external and internal quality, which meet consumer needs.

### Grower Networks

Both the FSB project and AVOMAN training have established valuable grower networks. For FSB the networks collect data and with AVOMAN the software is trialed, training given and field days conducted. It is now up to growers to support these initiatives otherwise they will disappear from lack of interest.

### Audit of R, D & E plan and program

The R & D program was subject to audit during the year to ensure that existing projects were relevant and that the sub-committee was adhering to industry's original brief. As a result a refocus of priorities was recommended as well as allocating

dedicated resources to assist with the management of sub-committee activities.

The audit found that the R, D & E plan was very much focused on production issues prior to the farm gate. It was noted that projects associated with the consumer end of the chain were all category C. A realignment was recommended to increase the emphasis on growing and delivering fruit that meets consumer expectations. No problem areas identified at the workshop in 1995 were deleted or amended but they were re-categorised and prioritised to change the focus from before the farm gate to quality to the consumer.

### Joint Conference with New Zealand

This successful conference attracted the world's leading avocado researchers to present their latest findings to an international audience. More information on the conference is presented later in this report.

### Exotic Pest and Disease Incursion

Contingency Plan This project has just started and will conduct a major analysis of the pests and diseases of potential concern to Australia. We thank the New Zealand industry for their contribution to the project.

## Quality Project Management Committee

### • **Background**

This project arose out of research conducted in 1990 and in 1993 that reported alarmingly high levels of internal quality problem with avocados. According to one study 53 percent of consumers found avocados that looked satisfactory were unsatisfactory when cut. The project was formulated in conjunction with Story Horticultural Services and Rudge Product Systems. A three-phase work-plan was developed over a four-year time frame.

### • **Phase One**

A national survey was undertaken to ascertain how avocados were being handled at wholesale and retail level. It was found that:

- (1) ripening was most frequently uncontrolled;
- (2) little if any importance was given to pulp temperatures of fruit;
- (3) there was an irregular supply of fruit at wholesale level requiring wholesalers to store fruit to service their customers;
- (4) product knowledge of the avocado was very low resulting in many incorrect practices.

From this study a hazard analysis was prepared.

### • **Phase two**

A national training strategy was developed using information gained from:

- (1) a survey of wholesale and retail handling practices;
- (2) a desk audit of current information, domestically and internationally;
- (3) the hazard analysis of handling practices.

The national training program consisted of workshops that focused on handling practices and controlled ripening. All major avocado handlers in the central markets attended the courses at least once and many retailers, particularly in Perth, were also trained.

### • **Phase Three**

This phase was conducted throughout the project and consisted of consumer market research and retail surveys. They evaluated consumer's perceptions about avocados and in the retail surveys fruit was bought from retail outlets in Sydney and Brisbane and cut open to evaluate the internal quality.

- (1) The research found that consumers regarded avocados as a high-risk purchase and discarded one in four purchased. However due to the uniqueness of the product consumers accepted a certain degree of risk.
- (2) The retail surveys indicated that a high proportion of internal quality problems were related to rots and bruising.

Whilst the project has come to a close, it is important to maintain the momentum created during the past 4 years and to address some of the problems identified.

- (1) **Bruising** - significant bruising was found in the same position on the fruit. This could be due to either packaging or transport or a combination of both.
- (2) **Ripening** - there is a need to further refine the controlled ripening process for different varieties at different stages of maturity. Currently one recipe is used and it is possible that it may not be entirely suitable for all varieties.
- (3) **Follow-on project** - there is scope for a follow-on project. All the information collected by the project could be consolidated to develop a code of practice for the industry.

The Federation has established a Quality/Code of Practice committee to advance the concept of a follow-on project.

### Quality/Code of Practice Subcommittee

The training momentum created over the four years of the Quality Management project will be wasted if a follow-up project is not initiated. Further, the project generated a large quantity of data, which if not captured and converted for multi-sector use, could be lost to the industry.

The March 1998 R, D & E audit identified that a code was needed to link growers and consumers to assist in the supply of quality fruit. Accordingly, the March 1998 board meeting established a Sub-committee to advance the matter. There was general agreement that a "Code of Practice" could prove to be a very useful tool and the committee's initial task is to explore the possibilities and make recommendations to the September 1998 meeting.

### Conference '97 Committee (Australian Component)

"Searching for Quality" was the theme chosen for Conference '97 by the joint organising committees. Coordinating a local event can be challenging but this event presented a steep learning curve for both halves of the committee because of the need to liaise and coordinate across the Tasman.

The result was seen in September 1997 when an extremely successful Australia and New Zealand Inaugural Avocado Conference was held in Rotorua, New Zealand.

People attended the conference from Australia, United States of America, Mexico, South Africa, Chile and New Zealand. Indeed it was regarded as the "World Conference - Southern Hemisphere". The attendance figure for the two-day marketing and technical event was in the region of 275 people.

The conference dinner was enjoyed by 218 people and the field day saw 190 people visit a number of orchards and packhouses. The pre-conference tour attracted 137 people.

There were a couple of timing hitches along the way mainly due to changing well laid plans at the last minute; however all seemed to take it in their stride.

### Marketing Forum

Due to this committee's efforts the Australian consumer is finally starting to recognise the health benefits of Avocados and are eating them more often.

Over the last few years the forum has tightened its strategy on promotions to include the health benefit message in all components of its marketing effort. This appears to have worked with the latest research results showing that 28 percent of the population now eat avocados on a regular basis (up from 21 percent 3 years ago) and that they are not nearly as concerned about fat and cholesterol in avocados.

The marketing program contains four major components - Public relations, In-store demonstrations, Point-of-sale information/recipe leaflets and Magazine advertising.

- (1) **Public Relations** - The aim of the PR program was to introduce consumers to the range of avocado varieties and to give them general tips on health benefits and usage, and recipe suggestions. It was estimated that from 6 press releases and a very successful media luncheon in Sydney exposure to the value of \$236,000 was generated.
- (2) **In-store demonstrations** - The aim was to introduce consumers to the taste and texture of avocados. Demonstrators were briefed on the health benefit message and offered serving, storage and purchasing suggestions.
- (3) **Point-of-Sale** - Avocado information and recipe leaflets were taken on board by the major retailers and distributed to consumers nationally through their systems.
- (4) **Advertising** - The advertising agency prepared three advertisements that involved people in lifestyle situations enjoying a meal with avocados - "Avocados really make a meal unique" The program purchased advertising space in magazines and targeted young women. Additionally advertising continues in the Bounty Pregnancy book and the Baby Care book where information about the nutrition of avocados, particularly folate, is published.

Overall we believe the marketing program has helped lift the image and demand for avocados. Consumption has increased by 30% in the last two years and this program together with the quality project has helped lift industry value.

### Directors' Portfolios

During the March Board meeting the industry strategic plan was reviewed and refreshed to accommodate changing needs and tasks completed. Directors each have a portfolio area of the plan and are charged with the task of overseeing and/or advancing the various areas. Outlined below is a list of the portfolios, the objectives and functions and the Director responsible for each area.

### Market Research - Mr R Richards

- **Objective** - To update existing consumer market research and initiate research as needed to further penetrate domestic marketing and identify export markets.
- **Functions** - Consumer research, wholesale/retailer surveys, establishing an export market database and initiating and maintaining communications with NZAGA on market research in general.

### Product Handling - Mr H Kwaczynski

- **Objective** - Initiate a quality handling system throughout the market chain.
- **Functions** - Develop a code of practice manual; develop training resources to support and reinforce wholesaler/retailer training programs; influence the design of and encourage the adoption of industry accepted standards in packaging and develop a wholesaler and, where applicable, a retailer accreditation system.

### Farm Management Practices - Mr F Moore

- **Objective** - Have the AVOMAN program in common usage and promote industry best practices.
- **Functions** - Encourage the continuation of regional productivity groups; encourage responsible chemical handling and usage; encourage implementation of quality assurance systems in all orchards; develop national farm care guidelines for the avocado industry; encourage utilisation of AVOMAN; encourage adoption of industry best practices and initiate and maintain communications with NZAGA on farm management practices.

### Marketing - Mrs M Ravanello

- **Objective** - Increase profitability at all points along the marketing chain by continuing an advertising and promotion plan. This plan should respond to opportunities identified from consumer market research thereby increasing and widening market penetration.
- **Function** - this portfolio is closely linked to the Marketing Forum of which Mrs Ravanello is Chair.

### Industry Data/ Statistics - Mr B Daley

- **Objective** - Create a data base which will cover the area planted, number of trees, production, sales, price and price indicator.
- **Function** - Participate in ABS surveys; consolidate and publish results of survey; investigate methods to obtain better market data and monitor crop forecasting systems.

### Quality Assurance - Un-allocated.

- **Objective** - Encourage the adoption of QA programs nationally.
- **Functions** - Introduce quality assurance for orchard management throughout regional producer groups based on SQF2000; prepare and publish articles in TA and encourage regional presentations.

### Export Marketing - Mr R Richards

**Objective** - Monitor and, when appropriate, form the basis of a coordinated export program. At present the export portfolio has been assigned a watching brief only.

### Funding - Un-allocated

- **Objective** - Broaden the base from which levies are collected. This portfolio is inactive.

### Communications - Mr F Moore

- **Objective** - To disseminate information in a timely fashion.
- **Functions** - Publication of Talking Avocados, information to Directors.

## Service Providers

### Horticultural Research & Development Corporation (HRDC)

Our relations with the HRDC remain good. The organisation has its new board in place since August with James McGeogh as Chairman, the dynamic Lindy Hyam as Managing Director and the experienced and helpful Gerard McEvilly continues to look after Avocado needs.

There was one upset during the year—the commercialisation of AVOMAN. We were disappointed by the lack of consultation and in the way that the matter was handled in general. The end result was that the organisation who owns the intellectual property rights, in this case the QDPI, owns AVOMAN. The HRDC, on our behalf, has only a 1% claim.

### Australian Horticultural Corporation (AHC)

Out with the old and in with the new is a very apt phrase to use here. The AHC has changed. It has a new board, Deputy Chairman John Gibson is the only continuing director, it is on its second Chairman and has a new managing director. The organisation's attitude has changed to one of consultation where the members' view is important and gets a fair hearing. Congratulations AHC, keep it up and we will continue to support you.

### AQIS

Relations between the Federation and Officers at AQIS remain amicable.

## Conclusion

The 1997-98 year has been a fairly busy one for the Federation, although unfortunately much of the effort has been in reacting to issues such as the Chemical Review Process rather than pro-actively progressing issues for the long term benefit of the industry. The challenge for your Federation is to ensure that a balance in the workload is maintained between the pro-active and reactive issues.

The highlights for the year from a grower's perspective were the successful conference in New Zealand, the final recommendations of the Endosulfan review and the imminent release of the AVOMAN and AVOINFO programs. The auditing of the R, D & E plan and the revisiting of the industry strategic plan were important issues for the continued development of this industry in a planned and strategic manner.

The strength and effectiveness of the Federation is the product of the commitment and involvement of the growers, their representatives on the Board, the members of the various sub-committees, the staff of the Corporations and the Executive Officer of the Federation. I would like to sincerely thank all those who contributed to the efforts of the Federation in 1997-8. The enthusiasm, professionalism and efforts of our Executive officer, Astrid Kennedy, have been greatly appreciated by myself as President, the Board and the industry at large.

Let's hope that 1998-9 sees a continued commitment to the industry from all stakeholders and that we don't need another "endosulfan" to galvanise our efforts to advance our industry.

## QUALITY



Conversely, in Sydney, chain No. 3 had the highest level of bruising (37.5%), just ahead of chain No. 2 (36.3%), with both chains having a similar proportion of affected fruit classed as unacceptable. This highlights the variation between supply chain systems.

### Anthracnose and Chilling Injury

Anthracnose was the second most common defect and similar levels were found in both cities. Chilling injury had markedly increased and was substantially higher in

Brisbane (11.7%). Only very minor levels of chilling injury were found in Sydney. Fruit were on special in Brisbane at the time of surveying and it is possible that older stock was being cleared which may explain the level of chilling injury observed. The photographs above show both anthracnose and chilling injury.

The presence of stones/hard lumps and dark streaks had decreased. However, the incidence of lumps/stones from supermarket samples was double in Brisbane (7.5%) as compared with Sydney (3.5%). Interestingly, more than half of the fruit affected in Brisbane was purchased from one supermarket chain.

Sydney consumers had larger fruit, paid higher prices but were offered better quality fruit in terms of the frequency and severity of any internal defects as compared with Brisbane. In both Brisbane and Sydney, supermarkets were found to present to consumers a fruit of superior internal quality to either fruit barns or fruiterers. Three Sydney supermarket chains were similar in performance and provided consumers with reasonable Hass avocados. In Brisbane, one supermarket chain offered consumers better Hass avocados (judged on internal

quality) whilst another chain offered fruit of reasonable quality.

### Results

On the basis of these observations, there still remains a significant need for improvement of internal quality of Hass avocados. This should be viewed as a partnership exercise where pre- and postharvest handling systems collectively need to deliver an avocado of consistently good internal quality to the consumer.

Handling systems should be examined within the supply chain, as clear differences in internal quality were obvious across the range of retail outlets surveyed. It should be stressed that the results of this survey are the cumulative results of moving avocados through the total supply chain and do not necessarily reflect on any one particular segment within that supply chain.

### Reports

Full copies of the two reports, "Internal Quality of Avocados in Brisbane and Sydney Retail Shops" and "Internal Quality of Avocados in Brisbane and Sydney Supermarkets" are available from the AAGF secretariat.

### Use Dates Or Code On Cartons By Rod Dalton

The report "Internal Quality Still a Big Issue" and the full report on the survey conducted in September 1998, highlights that the industry still has a lot of work to do to provide the consumer with high quality avocados.

An aspect of the problem that has been identified with the release of the report to all growers, whose fruit was sampled, is the age of some of the fruit. A few of the packers whose fruit was sampled were able to identify the date of packing of their fruit as they had included a date or code on their carton at time of packing. In one case the fruit had been packed on 31 July and sampled at retail level on 14 September. I believe 45 days storage in the carton is excessive!

I strongly urge all packers, as part of their quality management program, to put a date or code on each carton. The principal benefit of this action will be that if a problem is identified with their fruit in the marketplace, this information will help ensure that the source of the problem is correctly identified.



## BATSON FAMILY AVOCADO NURSERY



### ANVAS accredited Avocado Trees

**Varieties Include: Fuerte, Hass, Sharwil, Wurtz, Pinkerton and Reed**

Merv and Pat Batson have been growing avocados on their farm on the Sunshine Coast for 25 years and have operated the avocado nursery on a commercial basis for 20 years. They have a wealth of experience and knowledge and are more than happy to spend the time needed with customers to pass on this knowledge.

**Place your order now! Phone/Fax 07 544 21657**  
P.O. Box 105, Woombye Qld 4559

**Or call at the nursery at Schulz Road Woombye near the Big Pineapple**

## 'Quality' Team Prepares Guidelines For Suppliers

A national group of horticultural quality management trainers is answering the call of horticultural produce suppliers for a definitive guide to food safety and quality practices.

The guide will set out to dispel confusion in the horticulture industry over what basic steps must be taken by produce suppliers (growers and packers) to give assurance that their product is safe and meets customer quality demands.

"Proposed changes to the Food Standards Code will impact on the horticulture industry," working group coordinator, Scott Ledger of the DPI's Queensland Horticulture Institute said. "Food businesses will be required to establish a food safety management plan. It is unclear at this stage whether farms will be classified as a food business, but the customers of growers and packers certainly will be and they will

require food safety practices to be implemented."

Major customers, such as the supermarket chains, are demanding that their grower and wholesaler suppliers have a recognised quality management system, incorporating a Hazard Analysis and Critical Control Point (HACCP) based food safety plan.

In turn, wholesalers are demanding that produce suppliers develop a system which meets certain requirements for managing food safety and quality, described as an 'Approved Supplier Program'.

"There is much uncertainty about what these requirements should be," Mr Ledger said. "The guide would help customers and their suppliers determine requirements for approved supplier programs."

The supplier guide is expected to be ready for release later this year, when a comprehensive training program to assist

produce suppliers implement the requirements, will also be available to the horticulture industry. Businesses using a HACCP based quality management system will have already implemented the basic practices covered in the supplier guide.

The working group was formed after it was found that there was an urgent need for food safety and quality management guidelines to be developed for use throughout the horticulture industry.

A program for industry consultation in the refinement and acceptance of the guide has also been established. Mr Ledger said response had been most encouraging, with the concept winning widespread support.

Further information can be obtained from Mr Ledger at the Queensland Horticulture Institute, phone (07) 3406 8555.

## The SQF 2000 Quality Management System For Avocado Production And Packhouse

By Dave Duncan

### Introduction

A little over two years ago Paul Ryan addressed a meeting of members of the Avocado Growers Association of Western Australia (AGAWA), on the SQF2000 quality code. Also addressing the meeting was a grower of Red Globe table grapes who had already worked with the system with that crop. His enthusiasm was unbounded and infectious. He was probably on a steep learning curve and the discipline and accumulated crop knowledge built into the system enhanced his profitability considerably. While not all growers could expect to make the same scale of gain the meeting decided unanimously to investigate a similar development. The big hurdle was Paul Ryan's estimate of a \$80,000 price tag... well out of our financial reach.

### The Wherewithal

Those of you who have seen the terrible concrete floor in my shed would understand that Do-It-Yourself is not necessarily a wonderful way to go, but it was our only option.

The project organisation resulted in:

- AGAWA funded HACCP training for a group of six growers.
- Agriculture WA agreed to provide the services of Graham McAlpine and Alex McCarthy for up to 20 days each during 1997-98. Graham is experienced in guiding horticultural groups into the SQF2000 code and Alex is the department's liaison man with the avocado industry in WA.
- Growers contributed their time free of charge.
- AGAWA sought funding support from the Avocado Growers Committee of the Horticultural Produce Commission and HRDC. Both provided the requested support.
- The HRDC approved budget, \$11,000, was spent mainly on travel costs of all personnel, audit fees and printing costs.

### Results

The results of our efforts are to be presented in two separate binders covering **Production and Packhouse** operations.

**Part 1** is a Quality Manual, a system overview covering Quality Policy, Material Input Control,

Production Control, Inspection and Testing, Document Control and Quality Records, Product Identification and Traceability.

- Part 2**
- 2.1 HACCP Plans and Procedures
  - 2.2 HACCP Audit Check List
  - 2.3 Codes of Practice
  - 2.4 References

**Part 3** Quality Records

**Part 4** Document Register

The core of the system and the part which took us most time is 2.1, where we have broken the production process into 3 preproduction stages, 6 growth cycle stages, plus 2 more stages to cover harvest and canopy management.

In each Stage we have identified a number of process steps and for each process step we have attempted to define the hazards to food safety or fruit quality. For each hazard we attempt to specify control measures, critical limits, monitoring method and frequency, corrective actions, records and responsibilities.

In the Production binder, each Growth Stage is meant to be complete in itself, consequently there is much repetition from

stage to stage. The stages were selected because we perceived the need to introduce or delete some activity.

## What Now?

The system is generic and will need individual attention to modify it to produce a system for any particular operation wishing to receive SQF2000 accreditation. Any Growers or Packers seeking SQF 2000 accreditation will need to have contact with a "Skilled HACCP Practitioner" (SHP). A list of SHPs appears elsewhere in this issue. Computer skills of the "Cut and Paste" variety will also be valuable.

There is interest from AAGF and from regional growers groups in promoting the QA line. It seems that the most cost-effective way to do this is for regional groups to pick up the generic system produced by the AGAWA people and, as a group, review it for regional changes in emphasis before individualising for particular operations. Some department and/or SHP help may be needed.

It would also be advantageous if a few growers from each region undertook HACCP training (\$700 approx) and further training to SHP status could produce a resident facilitator. Nobody from the WA group has done this extra training (\$1500 plus). Regional groups would be expected to be self-funding.

If there is a perceived need for it, a small WA review group could continue to monitor changes thought to be necessary. Maybe new research results will change thinking. It seems unnecessary to record all regional changes unless they affect Critical Control Points or Quality Control Points.

After the first year there would have to be a charge for this, probably about \$50 annually per registered user. The price of the package, \$200, includes the cost of a

couple of review meetings during the first year after release.

## The Package

- The package being offered consists of:
1. Plastic comb bound printed copies of the Production and Packhouse generic Quality Management Systems.
  2. Floppy disc copies of the same.
  3. Printed ring binder covers complete with all necessary tabbed internal dividers.

The printed version is your starting point, the disc is to facilitate changes to suit your operation, and the binders are to house your working copy.

## No Abracadabras

There are no magic words. The system does not spell out how to manage your canopy, fertilise your trees, calibrate your sprayer or stomp on your spotting bugs. Instead it looks at the hazards to food safety, fruit quality, marketable yield and personnel safety and tries to offer some control over those hazards based on commonsense or a reference to some recognised authority e.g. AVOMAN.

## Giant Brains

Giant brains are not required to see that the package offered could be had for the cost of a little effort but less cash by collusion between potential users.

AGAWA does not seek to copyright or licence anything and does not seek to recoup funds already spent. It does want to cover the costs of printing and distribution and the costs of keeping a handle on what is happening with the system nationally for a year or two. Nobody wants a career as a minder.

When compared with the \$80,000 price tag to get to where we are now, the asking price of \$200 per user seems quite modest.

The adjacent box lists the Skilled HACCP Practitioners available for consultation.

## Skilled HACCP Practitioners

The following is a list of SQF 2000 Network Facilitators qualified in the intensive horticulture category, with contact phone numbers.

### WA

Chris Robinson - Kununurra	08 9166 4037
Malcolm McCallum - Perth	08 9311 5309
Stephen Pezet - Perth	08 9321 5556
Grant Wilson - Perth	08 9335 8999
Kim Burke - Perth	08 9368 3546
Graham McAlpine - Perth	08 9368 3330
Cheryl Hughes - Perth	0413 734 774

### VIC

Peter Bryar - Research	03 9437 0902
Gerrit Linde - Sunshine Coast	03 9364 8644
Graham Corless - Ocean Grove	03 5255 2270
Tim Marchington - Officer	03 5942 7210
Michael Hopf - Kew	03 9817 5632

### NSW

Debbie Peters - Oatlands	02 9898 0344
David White - Yanco	02 6951 2636
Ross Peters - Oatlands	02 9898 0344
Bruce Valentine - Orange	02 6361 3919
Gerard Kelly - Dareton	03 5027 4409

### QLD

Craig Firrell - Lowood	07 5426 4221
Anne Story - Toowoomba	07 4635 6845
David Licence - Nambour	07 5430 4930
John Nagle - Oonoonba	07 4722 2650
John Bagshaw - Hamilton	07 3406 8523
Scott Ledger - Hamilton	07 3406 8524
Neville Munro - Bris Markets	07 3379 4666
Michael Whereat - Gatton	07 5462 3190
Matthew Rogers - Townsville	074722 2661

### SA

Richard Akkermans - Glen Osmond	08 8272 3188
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## The SQF 2000 Quality Code

The SQF 2000 Quality Code has six elements and each element contains specific requirement that must be addressed to achieve certification. Parts of some of the elements of the ISO 9000 series have been incorporated into the Code to support the HACCP framework.

Anybody involved in developing, validating and verifying SQF 2000 HACCP plans must be licensed with AGWEST

Trade & Development. Once licensed, they are known as "Skilled HACCP Practitioners" (SHP).

SHPs must complete a HACCP training course recognised by AGWEST. A number of HACCP training courses are licensed and courses are available in all States. Currently there are 90 SHPs who have completed the course and are licensed.

## Auditing the SQF 2000 Quality Code

SGS International Certification Services and QAS (Quality Assurance Services P/L) are the two internationally recognised JASANZ accredited third party certification agencies currently licensed to certify and audit SQF 2000 quality systems. Their auditors must be HACCP trained,

experienced in the field being audited and registered with the Quality Society of Australasia at the food Safety Auditor level or above. SGS and QAS operate Australia wide.

The audit process has been aligned to the protocol required under ISO certification. A desk or document audit, a certification audit and six monthly maintenance audits are required. The time taken to audit SQF 2000 quality systems depends on their type and complexity.

**Current Status**

At the end of October 1998, a total of 385 businesses across many production/distribution and processing sectors Australia wide have gained certification to the SQF 2000 Quality Code with 88 being Western

Australian. According to projections by the licensed certifying bodies, the number with certification is expected to reach 500 by the end of 1998.

NSW Agriculture (Horticulture), Agriculture Victoria, DPIF Tasmania, Queensland DPI, Northern Territory DPI and SA Primary Industries are actively promoting the Code and assist producer groups with its implementation. The system is currently being implemented in Thailand and New Zealand. Interest has also been received from India, Israel, UK, France, Ireland, South Africa, Chile, Canada and the USA.

The SQF 2000 Quality Code has received support from organisations such as The Pork Council of Australia, the Quality Society of Australasia, the Wheat Quality CRC, The Grains Research and

Development Corporation, the Australian Fodder Industry Association, the Pork Research and Development Corporation, the Australian Horticultural Corporation, the Australian Apple & Pear Growers Association, the Australian Fresh Stone Fruit Growers Association, the Australian Quality Council, the WA Food Centre, SGS ICS, Quality Assurance Services, retailers Woolworths, Coles, Franklin's Australia and the NZ Ministry of Agriculture & Fisheries Quality Management Services to name a few.

For further information please contact Mr Paul Ryan, The Quality Manager, AGWEST Trade & Development, Agriculture Western Australia, Locked Bag 4, Bentley Delivery Centre, Bentley Western Australia 6983. Ph 08 9368 3382 Fax 08 9367 7389; E-mail atongue@agric.wa.gov.au



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## Award To Recognise Grower Quality

In its tenth year of operation, the Sunshine Coast Fruit Marketing Cooperative Assn. Ltd., trading as Natures Fruit Company, has created an annual award to recognise the grower who consistently provides the cooperative with quality fruit.

The award, called Natures Champion, acknowledges growers who make that extra effort to produce an outstanding product.

The company's Queensland based Nambour packhouse, has been at the forefront in implementing Quality Assurance programs into its operations.

With ISO 9002, HACCP and ICA 02 accreditation in place, it's all part of Natures Fruit Company's guarantee to the marketplace—a pivotal role in the ten-year success of marketing a quality product.

To further enhance these programs, the company will facilitate On-Farm Quality Management for its cooperative membership from next season—a move that is overwhelmingly supported by grower

members and of strategic relevance to the company's marketing effort.

Auditing will be from paddock to plate next season to ensuring consistency of quality for the Cooperative's customers.

The distinctive pink carton and symbolic trade mark have become synonymous with quality avocados.

One of the key areas of success has been its ability to command premium prices for its brands. Factors influencing this excellent result for growers have been the long lines of production, a focus on consistent quality and marketing expertise.

In excess of 400,000 trays of avocados are today marketed annually under Natures Fruit Company brands representing production from a 160-strong cooperative membership. And varietal production lengths are assured with membership stretching from Bundaberg in the north, to the Tamborine Mountains in the south and Toowoomba in the west.

Bundaberg based cooperative member, George Green, said that having joined Natures Fruit Company over four years ago, he now had a share in the best markets and a share of those long lines of consistent quality assured product. "It's a profitable exercise with few hassles," he said. "It's a lot harder on your own."

The company is well positioned to provide major retailers with preferred individual brand identification. Smaller growers cannot hope to compete in a market where the retailing of fresh fruit and vegetables is strongly influenced by the 'Big Three'. Only those operations with long lines of consistent quality assured product are positioned to effectively service this expanding market.

The Natures Champion award reinforces Natures Fruit Company's drive and support for quality excellence. The inaugural award would be presented early in 1999 following the current avocado season.

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# The Efficiency of Low and High Pressure Trunk Injection of Phosphonate Fungicide

By C. Kaiser, A.W. Whiley, Maroochy Research Station, Queensland Horticulture Institute, Nambour, and P.A. Hargreaves, Department of Natural Resources, Meiers Road, Indooroopilly

As part of the "Canopy health and management" project, evaluation of the efficiency of high-pressure injection systems currently used to trunk-inject avocado trees with phosphonate fungicides was carried out. High-pressure injection systems (Agmurf gas gun, the Rawlin's hydraulic injector and the Sidewinder®) have been introduced to the industry since the completion of the original phosphonate research in 1987, and have not been compared with the low-pressure (Chemjet®) system. In this research, the Sidewinder® was selected to represent the high-pressure injection systems while the opportunity was taken to assess uptake and translocation of phosphonate in well-watered and stressed trees.

Healthy, three-year-old 'Hass' trees with no previous history of phosphonate fungicide application, were chosen for the study. The water status of the experimental trees was preconditioned prior to phosphonate fungicidal injection by withdrawal of water from one group of trees (stressed, tensiometer reading of -55 kPa). Another group of trees was watered to field capacity the day before injection (non-stressed; tensiometer reading of less than -10 kPa). Eight stressed and eight non-stressed trees were injected just above the graft union between 8.30 and 9.30 a.m. using Chemjet® syringes, at a pressure of 80 kPa. At the same time, a similar group of trees were injected with a Sidewinder® high-pressure injector at pressures between 3500 and 3800 kPa, at approximately one metre above the ground. Later that same day, another identical group of trees was injected similarly between 12.30 and 1.30 p.m. The holes from the Chemjet® syringes were left open while Sidewinder® holes were sealed as per manufacturers instructions. Treatments included:

- (1) 15 mL of 20% phosphonic acid solution per metre of canopy diameter applied by Chemjet® (i.e. a total of 60 mL of 20% phosphonic acid per tree);
- (2) 15 mL of 20% phosphonic acid solution per metre of canopy diameter applied by Sidewinder® (i.e. a total

of 60 mL of 20% phosphonic acid per tree);

- (3) 7.5 mL of 40% phosphonic acid solution per metre canopy diameter applied by Sidewinder® (i.e. a total of 30 mL of 40% phosphonic acid per tree).

Note: the grams a.i. injected with both formulations of phosphonic acid is identical.

Samples of white feeder roots were taken fourteen days after injection from the four sides of the trees and analysed for phosphonic acid concentration.

## Results and Discussion

Uptake from the Chemjet® units is largely passive and dependent on the movement of the water stream in the trunk of the tree. With this equipment, injection uptake was faster in well-water trees compared with water-stressed trees at both times of the day in this study. This confirms previous observations that for the most rapid uptake from low-pressure injection, trees should be non-stressed so that they

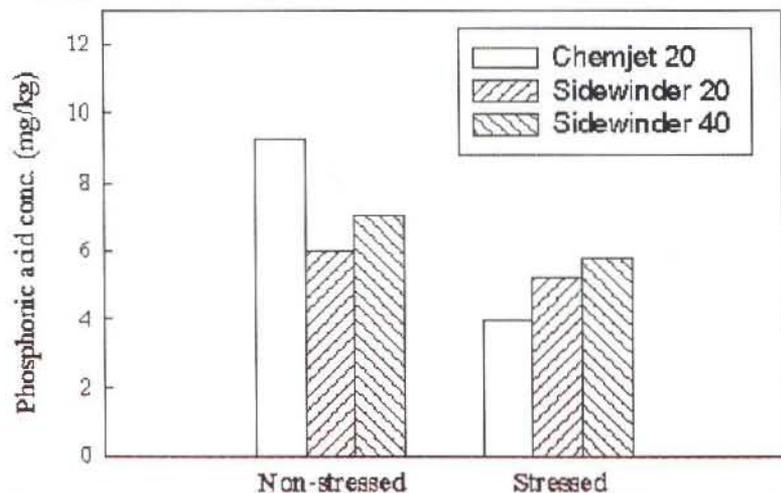
are actively losing water from leaves, hence moving water faster through the trunk.

Following the morning injections there was no commercial difference in the phosphonic acid concentration of roots between the two applicators or the different phosphonate fungicide concentrations used in well-watered and stressed trees (Figure 1).

Root phosphonic acid concentrations following afternoon injections were highest where the 40% phosphonate fungicide formulation was used with the Sidewinder® in well-watered trees (Figure 2). However, in stressed trees there was no commercial difference between either the applicator or the fungicide formulation used. The high phosphonic acid concentration in roots of well-watered trees following treatment with 40% phosphonate fungicide applied with the Sidewinder® is of interest but goes against the general trend of results. With our present knowledge there is no obvious physiological

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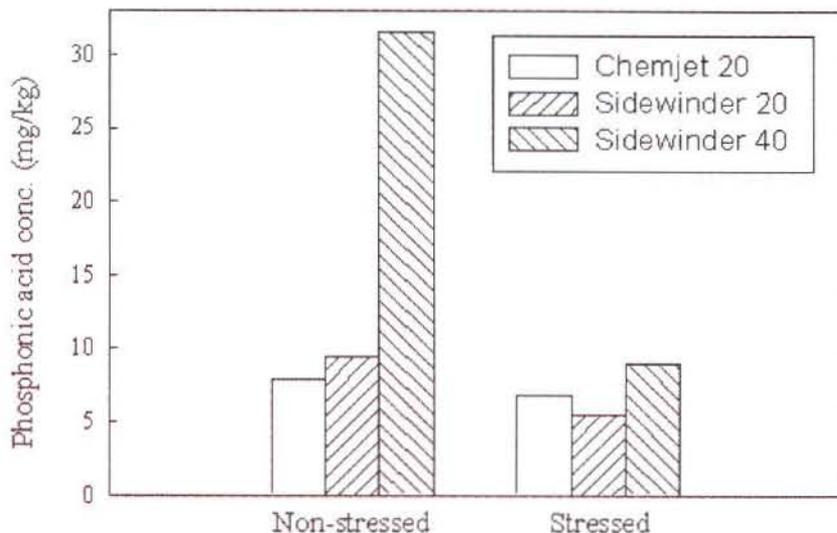
**Figure 1** Phosphonic acid root concentrations of well-watered and stressed trees following trunk injection with low-pressure (Chemjet®) and high-pressure (Sidewinder®) systems at 8.30 am. Phosphonic acid was injected as a 20% (Chemjet® and Sidewinder®) and 40% (Sidewinder®) formulation.



# Warning

Due to the current la Nina pattern, weather forecasters are predicting a higher probability for a wet summer in Queensland and northern NSW. The current la Nina pattern in the Pacific ocean is similar to that which preceded the 1974 summer, which caused extensive damage to avocado trees grown along the east coast of Australia. It is strongly recommended that protective action against Phytophthora root rot be taken in orchards where this disease is present before the onset of summer rains.

**Figure 2** Phosphonic acid root concentrations of well-watered and stressed trees following trunk injection with low-pressure (Chemjet®) and high-pressure (Sidewinder®) systems at 12.30 pm. Phosphonic acid was injected as a 20% (Chemjet® and Sidewinder®) and 40% (Sidewinder®) formulation.



explanation for this difference and caution should be exercised in interpreting this result. It may be due to a particular set of circumstances between the tree and the environment which is difficult to repeat, or experimental error.

### Conclusions

Following trunk injection with a phosphonate fungicide, low and high-pressure applicators gave similar phosphonic acid concentrations in avocado roots in well-watered or stressed trees. However, there was a general trend

for higher root phosphonic acid concentrations when trees were well-watered prior to injection. The phosphonic acid root concentration in this study mostly falls below that believed to be necessary for protection against Phytophthora root rot (about 20 mg/kg). This is because trees were injected when spring growth was still flushing, a practice not recommended to optimise root phosphonic acid concentration.

Injection of healthy trees as a protection strategy during or shortly after flowering will limit the amount of phosphonic acid reaching the roots and give excessive fruit

residues which may exceed MRL's at harvest. These trees should be injected when the spring flush matures if treatment is required at this time of the year. Non-fruiting, diseased trees can be injected at any time during the spring and should be retreated during summer.

When using Chemjet® applicators, uptake time was faster in non-stressed trees. While our study has shown high-pressure injection systems give similar results to low-pressure systems, the potential for structural damage to trees is much greater if excessive pressure is used. Safe uptake with high-pressure injection is also dependent on water movement within the tree and operators of this equipment should not use excessive pressure when resistance to uptake increases. Check with the manufacturers of high-pressure injection systems for their recommendations.

### Acknowledgments

Assistance for this research was provided by Chemjet® Trading Pty Ltd and Sidewinder Injection Technology Pty Ltd with funding from the Queensland Horticultural Institute, The Australian Avocado Growers' Federation and the Horticulture Research and Development Corporation. We also thank Simpson Farms for access to the experimental trees.

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# Fungicide Screening Experiment to Control Anthracnose in Avocado

By Sonia Willingham, Lindy Coates, Tony Cooke, Ken Pegg, Peter Langdon, Jan Dean and Dean Beasley  
(Queensland Horticulture Institute, Indooroopilly DPI)

The fungicide screening experiment was part of an AAGF/HRDC-funded project on "The Field Management of Avocado Postharvest Diseases".

The major postharvest diseases in avocado fruit are anthracnose and stem-end rot. Field management of these diseases currently relies on orchard hygiene and regular protectant copper sprays. Some examples of good orchard hygiene practices include pruning of lower tree limbs to facilitate tree ventilation, removal of infected fruit, dead leaves, twigs and branches from the tree canopy prior to flowering, and controlling insect pests to minimise fruit damage.

Because copper is a protectant fungicide, it needs to be applied frequently and for best results, complete coverage is essential. This means that during showery

weather the number of sprays required can easily escalate.

## Spray Treatments

The aim of this experiment was to evaluate a range of fungicide compounds for their efficacy against both preharvest (e.g. pepper spot, sooty blotch) and postharvest diseases in avocado. The following compounds were applied as a foliar spray (from fruit set until harvest) to a block of 6 year-old 'Hass' trees growing in a commercial orchard at Mt. Tamborine, Queensland:

1. Control - untreated
2. Bravo 500 (chlorothalonil)
3. Fungicide A
4. Kocide (copper hydroxide)
5. Fungicide B
6. Dithane OC (mancozeb + oil)

7. Fungex (potassium phosphonate) + Profert (protein fertiliser) + Xtend (oil)
8. CGA 245704 + oil

All of these treatments, except Fungicide A, were reduced from a 28-day spray interval to a 14 day spray interval during showery weather. Fungicides A and B are unregistered experimental products and thus, we are not permitted to identify these compounds. However, we can state that Fungicide B is a new class of fungicides derived from naturally occurring compounds. This fungicide has a low toxicity (to mammals and bees) and is non-persistent in the environment. Thus, this product is considered to have a reduced

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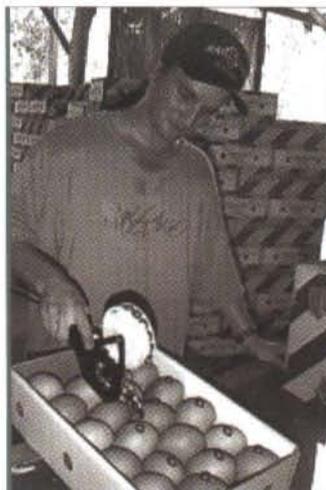
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risk profile to consumers, the environment and operators.

Prior to harvest, fruit were rated for the preharvest diseases, pepper spot and sooty blotch. At this time the trees were also rated for phytotoxicity symptoms, blossom emergence and foliage density.

Mature fruit were harvested in July 1998, ripened at 22°C (65% RH), and assessed for disease. The effect of fruit position on disease was also evaluated by comparing fruit harvested from the north side of the tree to fruit harvested from the south side of the tree.

## Field Results

The Bravo, Kocide, Fungicide B and Dithane spray treatments all reduced the incidence of pepper spot (Figure 1). The Fungicide A, Fungex and CGA treatments had no effect, but there was a trend of the Fungex and CGA treatments slightly increasing the incidence of pepper spot on fruit.

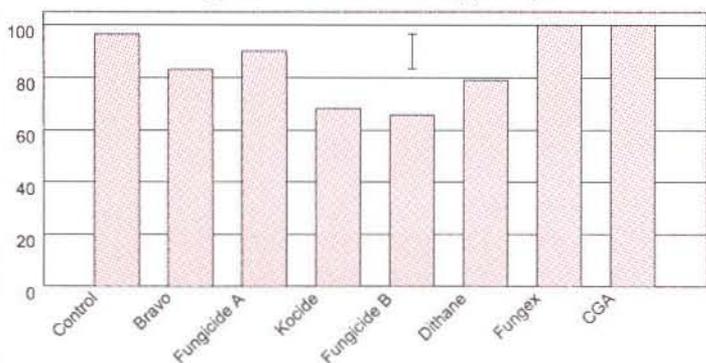
All of the spray treatments, except Fungex, reduced the appearance of sooty blotch on the autumn flush branches (Figure 2). Fungicide B and Kocide were the most effective.

symptoms, with the most severe symptoms occurring on the Fungex sprayed trees.

The phytotoxic reaction on the leaves may have been due to the high oil content of these treatment solutions. The Fungex treatment also delayed blossom emergence (Figure 4) and reduced foliage density (Figure 5). Similar observations were made for the CGA treatment, which showed a definite trend of delayed blossom emergence and a significant reduction in foliage density.

An interesting 'greening' effect was observed in trees sprayed with the natural product, Fungicide B. The canopies of trees from this treatment had an overall healthier appearance due to a combination of greener and glossier leaves and a higher proportion of clean fruit. This 'greening' effect has been noted by other researchers working with this fungicide on other crops, and has been attributed to the ability of the fungicide to increase photosynthesis and retard senescence.

Figure 1: Incidence of Pepper Spot



The Fungicide A, Kocide and Fungicide B spray treatments did not cause any foliar symptoms of phytotoxicity (Figure 3). The Bravo, Dithane, Fungex and CGA spray treatments however, all caused some phytotoxicity

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The unique mode of action of this fungicide which includes novel redistribution on and in the plant, also allows the tree to put more energy into growth processes, as less energy is spent on host-defence reactions.

**Postharvest Disease Results**

Fruit from the Fungex spray treatment took the longest time to ripen, with some fruit failing to soften 17 days after harvest (Table 1). Fruit from the Bravo, Fungicide A, Kocide, Fungicide B and Dithane sprayed trees all had similar shelf lives, and took longer to ripen than the unsprayed Control fruit which ripened the quickest.

The incidence of anthracnose in ripe fruit was reduced by both the Fungicide B and Kocide spray treatments (Table 1). Fungicide B reduced anthracnose by 27% and Kocide reduced it by 18%. The

Fungicide B spray treatment also had the highest proportion of marketable fruit, and was 15% higher than the unsprayed Control fruit (Table 1). It is important to point out that none of the fruit received any postharvest fungicide treatment nor controlled ripening, both of which would have reduced disease and improved marketability.

In comparison, the Fungex and CGA spray treatments increased the incidence of anthracnose by 15-20% and reduced fruit marketability by 30-40% (Table 1). Fruit from these two treatments also had higher incidences of stem-end rot (data not shown).

The Bravo, Fungicide A and Dithane spray treatments did not have a significant impact on postharvest diseases, except the Bravo and Dithane treatments reduced the proportion of marketable fruit by 13-14% (Table 1).

A fruit position effect on shelf life and disease was also observed. Fruit harvested from the south side of the tree took longer to ripen, had less anthracnose and were more marketable than fruit harvested from the north side of the tree, across all treatments.

**Conclusion**

The most effective fungicides identified in this experiment to reduce both preharvest and postharvest diseases were Fungicide B and Kocide, whereas the Fungex and CGA spray treatments had an overall negative impact on diseases. It is important to remember that none of the fruit received any postharvest fungicide treatments or controlled ripening, both of which would have reduced disease and improved marketability.

**Future Research**

Three field experiments are currently underway to further evaluate Fungicide B (different formulations and application rates) and new forms of copper fungicides.

**Acknowledgments**

We wish to thank the AAGF, HRDC and QHI for funding this research and Charlie Eden for his collaboration with the fieldwork.

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Figure 2: Sooty Blotch

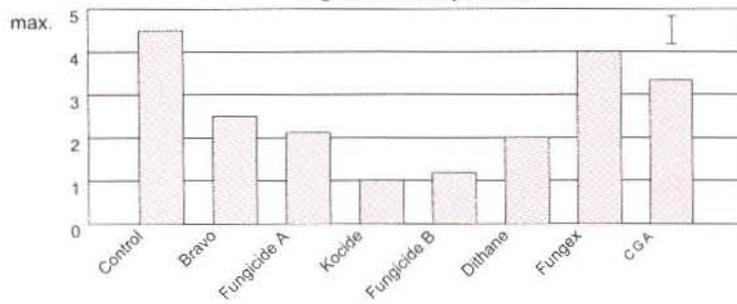


Figure 3: Foliar Phytotoxicity

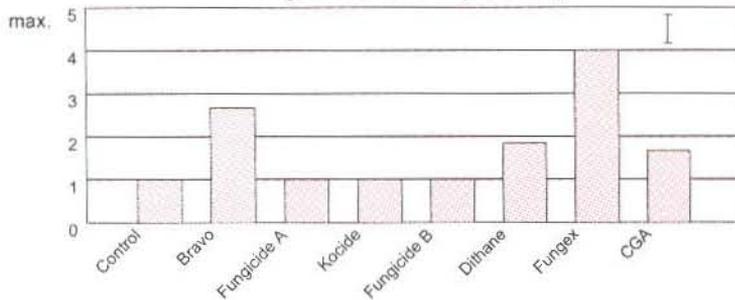


Figure 4: Blossom Emergence

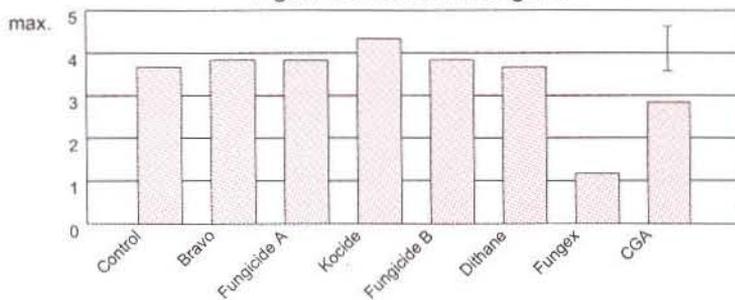
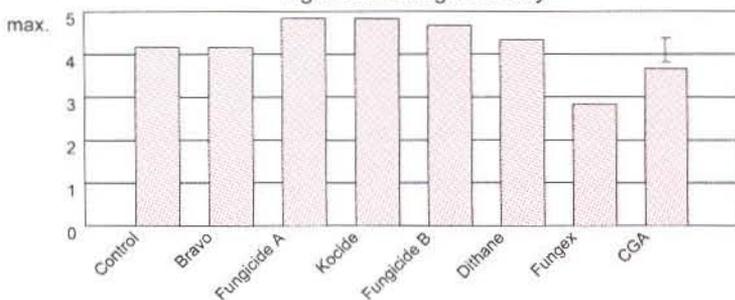


Figure 5: Foliage Density



**Table 1. The effect of various fungicide compounds on shelf life and disease of 'Hass' avocado ripened at 22°C (65% RH).**

Treatment	Shelf Life (days)	Incidence of Anthracnose (%)	Marketable Fruit* (%)
Control	8.1	74.9	51.3
Bravo	9.0	78.0	37.2
Fungicide A	8.4	60.2	62.0
Kocide	8.6	56.5	60.2
Fungicide B	8.5	48.1	66.1
Dithane	8.9	81.5	38.7
Fungex	10.8	97.4	7.8
CGA	9.7	89.5	21.4

\* marketable fruit was calculated as the percent of fruit with 5% or less anthracnose and no stem-end rot

# Fruit Spotting Bug Update Report

By Dr Shaun Hood, Queensland Horticulture Institute, Maroochy Research Station, Nambour QLD

## A description of the names behind the bug

Most of you will be familiar with common insect pest names. These are used by scientists, growers and consultants to identify various pests. Common names are easy to remember and often descriptive in nature. They can identify the crop on which the pest feeds (e.g. banana-spotting bug), the type of damage they cause (e.g. fruitspotting bug) and even the pest's physical appearance (e.g. red-shouldered leaf beetle).

Insects also have scientific names, which are based on a classification system developed over 200 years ago by the Swedish biologist, Carolus Linnaeus. Generally highlighted in normal text by appearing in *Italics*, scientific names are of Latin origin or may be Latinised forms of English. Although common names can vary between States and even countries, scientific names are the same throughout the world and each insect has its own name. We will use spotting bugs to explain how the Linnaeus' naming system works.

Australia has three different spotting bugs, but only the fruitspotting bug, *Amblypelta nitida* Stål and banana-spotting bug, *Amblypelta lutescens* (Distant), are considered economically important pests.

Spotting bugs belong to the family Coreidae, they produce repellent odours and are pests of a range of crops around the world.

The first thing you will notice is that both spotting bugs have the same first scientific name (ie. *Amblypelta*), this denotes the genus. The genus describes a group of closely related organisms. The second scientific name denotes the species (e.g. *lutescens* and *nitida*).

Species generally differ from one other in at least one morphological characteristic and they do not interbreed freely with one another where their ranges overlap in nature.

The name that appears after the species is last name of the person who originally described the species (e.g. Stål). If the name appears in brackets (e.g. [Distant]) the author re-described a species previously named by another person.

Banana-spotting and fruitspotting bugs are often almost impossible to tell apart and even the experts have to occasionally turn them over and have a close look at their genitalia under a dissecting microscope. There

is an easier way, but you would have to be lucky enough to catch the bugs mating. Fruitspotting bugs mate with the male riding on the female's back, the male is usually leaning a little to one side depending on which side he coupled up with the female. Although mating fruitspotting bugs tend to remain relatively stationary, they can and do move—the female simply gives the male a piggyback. Maybe that's why females are larger than males?

Banana-spotting bugs mate a little differently. Although they start out much the same way as fruitspotting bugs, they end up in a totally different position. When they first couple up, the male will stroke the female's head with his front two legs, then he swings around so that they are facing in opposite directions. If banana-spotting bugs move while mating, the females lead the way, the males walk backwards.

So which spotting bug had lunch in your orchard? Depending on what crop you have and where you are located, you could have one or both species. At the end of the day it really doesn't matter. Both bugs are cryptically coloured and extremely difficult to find in the field. Chances are you will only ever see their damage! Irrespective of which bug you have, control methods are exactly the same. In a later issue we will talk about another major difference between the species. Did you know fruitspotting and banana-spotting bugs have quite different host ranges?

In the next issue Geoff Waite will review the occurrence of fruitspotting type bugs around the world. This article will put everything in perspective and you will soon realise that these bugs are a worldwide problem!

In addition to identifying the major fruitspotting bug species, Geoff will describe the different crops damaged in countries like Africa, South America, China, Malaysia and Papua New Guinea.

## What have we been up to since the last report?

We have been quantifying spotting bug damage throughout the season

On both avocado and macadamia, we are investigating how spotting bug damage is expressed throughout the season. In other words, if fruit or nuts are damaged in say October, what happens to them? Do the fruit and nuts hang on the tree, or do they drop off? If they fall off, what proportion is likely to do so and how does this relate to the natural fruit/nut drop?

Clarification of the link between damage and tree phenology will assist in the development (in the case of avocado), or fine tuning (in the case of macadamia), of more reliable monitoring programs.

The experiments involved caging bugs on fruit and nuts in the field for a defined period. On their removal, we recorded fruit/nut drop every second day (obviously comparisons are made with a control using bagged fruit/nuts with no bugs). At this stage the October and November experiments are complete and we are working on data analysis. Here we have tabulated some of the data collected in October. The avocado and macadamia data are displayed in tables 1 and 2 respectively.

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TABLE 1: A data summary of the October avocado damage experiment. Comparisons are made between Fuerte and Hass. Fruit diameter recorded on Day 0, number of stings recorded on Day 1 and cumulative fruit drop expressed as a percentage at various time intervals for

Variety	Fruit diameter (mm) on Day 0 (Median and Range)		Number of stings on Day 1 (Median and Range)				
Fuerte	18 (13 - 25)		5 (0 - 14)				
Hass	16 (10 - 22)		4 (0 - 12)				
<b>Cumulative fruit drop (%) recorded at intervals after feeding</b>							
	Days	3	5	7	9	11	14
Fuerte	Treatment	4	4	12	12	16	24
	Control	0	0	0	0	3	10
Hass	Treatment	2	2	7	16	22	55
	Control	6	6	9	13	13	16

In the avocado experiment we compared damage in Fuerte and Hass. Most of you will agree that Fuerte is widely recognised as a more susceptible variety because of its thin skin, whereas Hass is thought to be a little less susceptible because it has a thicker skin. It has been suggested that Fuerte may also be more susceptible because it is an early maturing variety. While Fuerte does mature earlier, both Fuerte and Hass were approximately the same size in October (Table 1), therefore both were available as a target for bugs. Although Hass had not yet developed its characteristic thick skin, there may well have been other differences that made Fuerte more susceptible.

There is an alternative argument that both varieties may be equally susceptible,

the only difference between them being our ability to recognise the damage on the rough, thick skin of Hass. We will talk about this in more detail in a later issue.

In October, we compared the number of stings recorded after the bugs had fed for 24 hours (*i.e.* Day 1, see Table 1). There was no significant difference between cultivars, species (*i.e.* *A. Lutescens* and *A. Nitida*), or sex of the bugs. With regard to fruit drop, there was little difference between varieties one week after the damage had occurred (Table 1).

However, two weeks after the fruit had been damaged (*i.e.* day 14), Hass had lost 55% of the fruit, double that lost by Fuerte. We are still monitoring the treatment and control fruit and will do so until harvest, when the fruit will be critically assessed for damage and graded.

In November, damaged fruit took a little longer to fall from the trees. Two weeks after the fruit had been damaged, only 10% of the fruit had aborted (on both Fuerte and Hass). This experiment will become more interesting as the fruit continue to mature. We expect the rate of fruit abscission as a result of damage to decline as the fruit get larger.

Interestingly, fresh damage (less than 24 hours old) was relatively easy to recognise on both Fuerte and Hass. In November, 81% of the damaged fruit produced the white exudate typically associated with fresh spotting bug damage. Unfortunately our ability to recognise damage declined with the age of the damage. Just one week after the fruit had been damaged we recorded an average of only 2 stings per fruit whereas a week

earlier, we recorded 3 stings per fruit. Invisible stings may make the development of a monitoring system extremely difficult, but we haven't given up yet!

In the macadamia experiment we compared damage in two cultivars, 741 and 344. Sampling during the 1997-98 season revealed 344 trees had higher numbers of spotting bugs and more damage than the 741 cultivar.

In comparison with the avocado experiment, the effect of damage was more dramatic on macadamia. In both macadamia varieties, nut drop had virtually ceased by Day 7 (Table 2). On Day 7, nut drop was significantly higher on those racemes exposed to bugs (*i.e.* treatment) compared to those without bugs (*i.e.* control) (Table 2).

A comparison of nut drop on Day 7 revealed that significantly more nuts were lost on the 741 racemes than the 344 racemes (Table 2). However, this may have been because the 741 racemes had significantly more nuts to start with. Both the banana-spotting and fruitspotting bugs fed on similar numbers of nuts while caged on the racemes. In contrast to the avocado experiment, we recorded a difference between the sexes, but this was noted on only one cultivar.

On 741 racemes, female bugs damaged significantly more nuts than the males. However, on 344 racemes there was no significant difference between the sexes.

On Day 14, all nuts remaining on the trees in both the treatment and control were cut open and checked for bug damage. None of these nuts were damaged.

Damaged nuts took a little longer to drop during the November experiment. As the nuts continue to mature and the shells start to harden, nut drop is expected to cease.

### We have been investigating bug development on different diets

Although most growers are able to recognise spotting bug damage, only a few will have ever seen an adult bug feeding in their orchard. The above damage assessment certainly shows what adult bugs are capable of, but what about young spotting bugs?

Young spotting bugs are sometimes referred to as nymphs or instars. Nymphs moult five times before becoming an adult. Moulting basically involves the bug shedding its old skin as it increases in size. Each time they moult they are assigned to a different instar. For example, newly hatched spotting bugs are called 1<sup>st</sup> instars and

**TABLE 2: A data summary of the October macadamia damage experiment. Comparisons are made between the 741 and 344 cultivars. Nut diameter was recorded on Day 0, number of fallen nuts was recorded on Day 7 and cumulative nut drop expressed as a percentage at various time intervals for the treatment (bugs) and control (no bugs) is given.**

Cultivar	Fruit diameter (mm) on Day 0 (Median and Range)		Number of fallen nuts on Day 7 (Median and Range)				
	Days	3	5	7	9	11	14
741	4 (2 - 7)		6 (3 - 13)				
344	4 (2 - 14)		5 (0 - 14)				
<b>Cumulative fruit drop (%) recorded at intervals after feeding</b>							
741	Treatment	2	55	75	75	79	80
	Control	8	26	36	38	47	53
344	Treatment	9	66	80	82	89	92
	Control	11	18	26	37	43	48

**TABLE 3: A data summary of mortality recorded in the spotting bug development experiment. The percentage of spotting bugs dying in each instar while fed on a diet of either avocado, beans or macadamia are given. (NB: Mortality in later instars has not been included because development is not yet complete).**

Diet	Instar	% of Banana-spotting bugs dying	% of Fruitspotting bugs dying
Avocado	1 <sup>st</sup>	0	0
	2 <sup>nd</sup>	100	100
	3 <sup>rd</sup>	-	-
Beans	1 <sup>st</sup>	2	0
	2 <sup>nd</sup>	33	47
	3 <sup>rd</sup>	11	20
Macadamia	1 <sup>st</sup>	5	0
	2 <sup>nd</sup>	79	51
	3 <sup>rd</sup>	0	3



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when they moult they become 2<sup>nd</sup> instars, and so on.... Collectively, instars are referred to as nymphs. Both adults and nymphs feed in the same way, the only real difference being the intensity of damage caused. As part of the above damage assessment, we are only just starting to learn how to efficiently identify adult damage throughout the season. The type of damage caused by nymphs is still largely unknown.

To learn more about the biology of the spotting bugs, we set out to study bug development at ambient temperatures. To do this we compared the development of the banana-spotting and fruitspotting bugs on three different diets. Avocado and macadamia were evaluated for obvious reasons and beans were selected because the laboratory culture is reared on beans. Newly hatched 1<sup>st</sup> instar bugs were placed in small rearing containers and fed either avocado, macadamia or beans. The data in Table 3 summary illustrates mortality recorded up until 1 December 1998.

Although we have known for quite some time that mortality in the laboratory culture is unusually high during the 2<sup>nd</sup> instar, we were somewhat surprised to find such a difference between the diets. Beans proved the best—as of 1 December, 53% of the bugs fed on beans were still alive. The above damage assessment showed both banana-spotting and fruitspotting bugs were more than capable of surviving on avocado and macadamia, yet for some unknown reason the nymphs didn't do so well. This may be because the fruit and nuts had been removed from the tree, perhaps some sort of hydrostatic pressure is required to assist the bugs when feeding. When all bugs have either died or made it to the adult stage, we will calculate the duration of each instar on each diet.

### **We have been field-testing some promising alternative insecticides!**

Three field experiments are currently in progress to test alternatives to endosulfan.

**TABLE 4: A data summary showing how many spotting bugs were collected from around the Sunshine Coast and northern New South Wales between September and November 1998. The number of adult males and females as well as nymphs are given.**

	Number of Banana-spotting bugs	Number of Fruitspotting bugs
Adult Males	180	155
Adult females	170	167
Nymphs	210	308
Total	560	630

All experiments were designed to evaluate some of the promising insecticides identified by Gus Campbell in laboratory bioassays (see the June Progress Report). All experiments are evaluating Thiodan<sup>®</sup> (endosulfan), Bulldock<sup>®</sup> (beta-cyfluthrin) and Mavrik<sup>®</sup> (fluvalinate). One experiment based at Maroochy Research Station is investigating the residual activity of each insecticide.

The experiment was conducted on papaw, with the plants being sprayed and spotting bugs caged at intervals after the spray was applied. The residual activity of the chemicals over two weeks has been scored in terms of bug mortality. The other two experiments are being conducted in macadamia and avocado orchards near Nambour. Bug pressure in the macadamia trial has been exceptionally high and all of the treatments are struggling to achieve control.

### **What do we have planned for the next three months?**

We are well on the way to achieving our project milestones. HRDC has recently accepted Project Milestone Number 3. In the last issue we mentioned we were hoping for a 'good bug season', fortunately it looks like the bugs have certainly come to the party! We have had plenty of phone calls from lots of growers and other interested parties. It's encouraging to see so many people taking an interest in the project!

### **We will continue experiments already in progress**

This is definitely our busiest time of the year and although we are flat out, we will try to make the most of opportunities as they arise. Some of the experiments started in the last three months are ongoing and will continue for most of the fruiting season, so the next three months are already looking very busy.

### **We will quantify the effect of natural mortality factors**

In the September Issue, we reported that female bugs were capable of producing approximately two eggs a day in the laboratory. If spotting bugs in the field are capable of this, there must be plenty of nymphs out there, but like

the adults, nymphs are not all that easy to find!

For some unknown reason, non-sprayed plants (eg. mock orange) hosting reasonably high numbers of adults, do not always produce anywhere near the number of nymphs we would expect. While this could certainly be attributed to high 2<sup>nd</sup> instar mortality, it's possible that predation and parasitism may also be significant. In January we plan to quantify the effect of beneficials and other causes of mortality. Understanding the role of predators and parasites is an important part of any potential IPM program.

### **We will investigate the effect of some insecticides on beneficials**

The value of endosulfan as a fruitspotting bug control lies in its compatibility with IPM strategies. Ideally, alternatives should possess some of the same attributes. In the next three months we will investigate some of the methods used to evaluate the effect that insecticides have on various predators and parasites. If a suitable method is found, we will carry out some preliminary experiments to test the chemicals currently being trialled.

### **Field days and spotting bug presentations**

Since the last report we have been concentrating on lots of field work and it is starting to pay off as we are getting some great results. Field days and presentations at conferences are a great way to communicate with a large audience, they allow participants to ask lots of questions.

Since the last report we have made presentations at the Australian Macadamia Society Technical Conference (Gold Coast), a custard apple field day held by the Australian Custard Apple Growers Association (Nambour) and an avocado field day held by the Tamborine Mountain Local Producer Association (Mount Tamborine). We also attended some of the Spray Application Workshops run by Robert Battaglia.

### **Thank you to everybody who helped collect bugs**

With your help we collected a massive 1,190 spotting bugs. The following Table shows how many of the bugs were banana-spotting and how many were fruitspotting. It also gives a breakdown of their sex and whether or not they were adults or nymphs.



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Anthony Llanos with his World Record Avocado