

Talking Avocados

FOCUS ON RESEARCH

Percentage

level of bruising

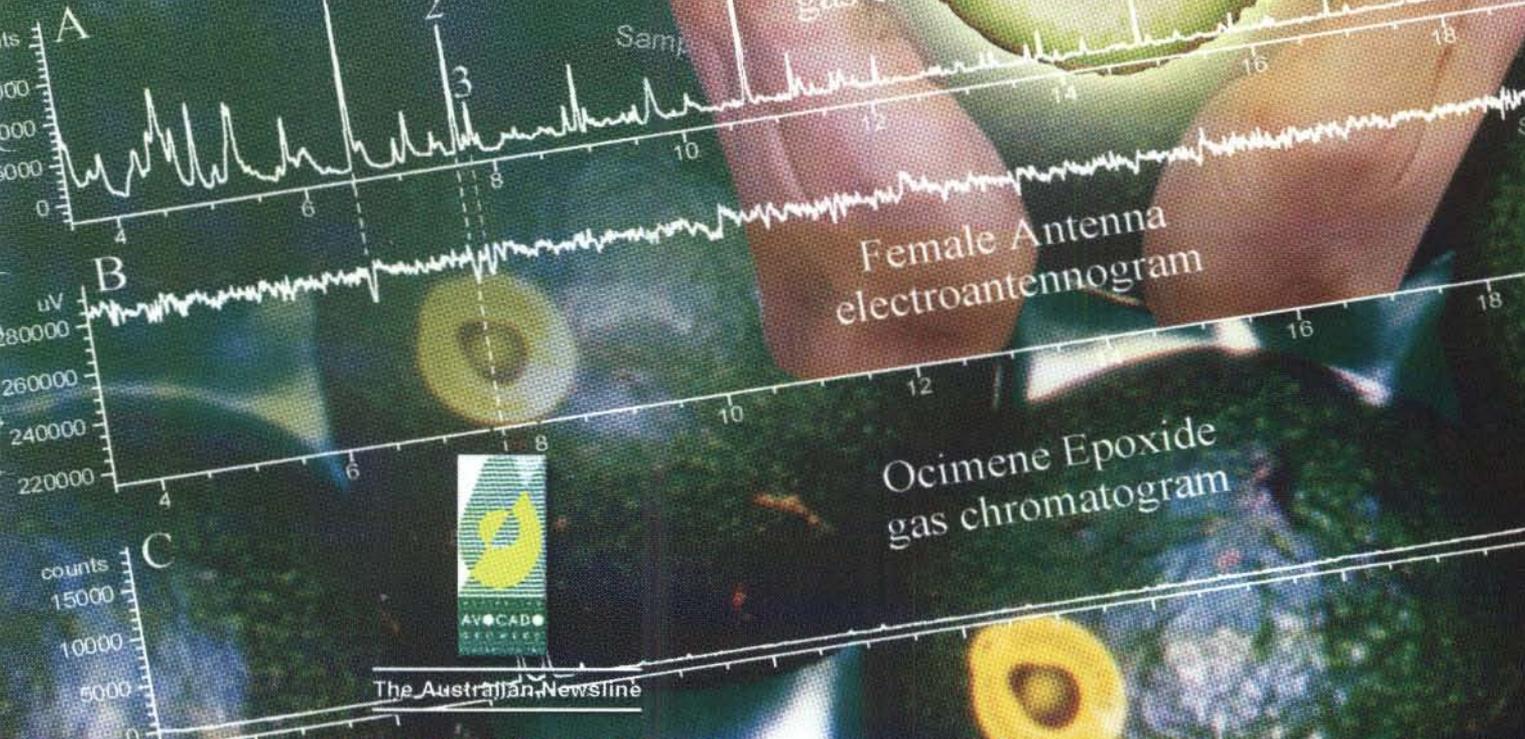
Percentage of fruit with at least

flesh

Male Aeration
gas chromatogram

Female Antenna
electroantennogram

Ocimene Epoxide
gas chromatogram



The Australian Newsline

SUMMER 2002/2003 ISSUE

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MY COMMENT



Welcome to the Summer Issue of Talking Avocados. It is also 2003 and a Happy and Prosperous Year to one and all. Let's hope that the trials and tribulations that this nation of ours faced in 2002 can be put behind us.

I am not in the habit of making any comments on your industry. However, I recently had a 'bad experience' concerning the purchase of a pack of four Hass avocados from a national retailer. This is not the first time this has occurred but it has been sometime since the last 'experience'.

The avocado pack was on special and carried a generic sticker (could have been Australian or NZ). It was purchased on a Saturday for use with a salad on the Sunday evening. They were left out of the refrigerator as two were almost ripe and ready for use. The other two were dark in colour but firm to the touch.

When cutting the first it had dark patches throughout and didn't come away from the skin well and the second was worse – inedible.

From my experience the cause can be attributed to one of two factors and probably a combination of both. That is that they had been held in cold storage for too long or over chilled and their life cycle had passed.

I don't need to tell you that this 'bad experience' impacts on your industry. The purchaser is immediately turned off making another purchase in the short term – which has been my reaction. Well, what did I do about it?

Presented myself at the store, asked for the manager, explained who I was, told him what I considered was the problem and asked that he do something about it as the chances were, other consumers would have the same 'bad experience'.

I wasn't interested in replacing them, and told him so, but spoke of the problem being one related to bad handling and the ultimate impact back to the grower in the form of decreased sales. It was interesting to note that the avocado packs went straight out on the shelves on delivery from the distribution centre.

Some time back I had a similar experience - ironically with the same national retailer in Hervey Bay, Queensland. On that occasion the store in Bundaberg sent me a box of 'Roses' chocolates for my trouble!

What concerns me is that there are some people in the fresh produce industry who simply do not understand that cool storage does not keep a fresh product in suspended animation. All fresh produce has a limited life span though some seem to believe that this can be extended almost indefinitely by cool storage.

How 'fresh is fresh' is my question as we come to depend more and more on extending the life of products through refrigeration – and to reduce wastage.

TALKING AVOCADOS

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

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I believe that the growing side of horticulture needs to look very closely at how their product is being handled at the retail end. There is definitely room for improvement.

And by the way, I walked into the same retail store on the weekend and the strong mango aroma in the fruit and veg. section made one want to race over and grab a few. When one considers this is the first time I've notice this mango selling point and, it's after New Year and, the mango season has been underway since October – 'a bit of food for thought'.

Happy New Year!

Col Scotney - Editor

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PRESIDENT'S PERSPECTIVE



Welcome to 2003 and let's hope that the universal wish for a wet year or at least a return to a "normal" season, whatever that is supposed to be, is "heard". I trust you were able to enjoy at least a short break over Christmas with family and friends.

2003 is shaping as a very "interesting" year as far as avocado production and marketing is concerned. New Zealand looks like having good volumes into Australia into the New Year. Their volumes to the USA were lower than expected due to lower prices, wharf strikes and lack of fruit available for export.

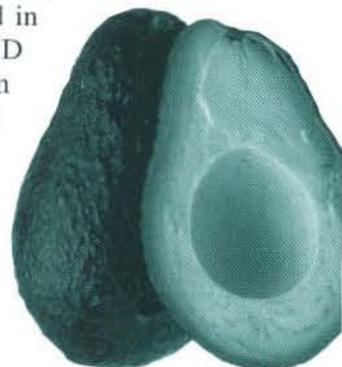
North Queensland and Bundaberg regions, by all reports, have average to good crops. The rest of Qld and Nth NSW will be a mixed bag with many orchards holding small crops due to the dry season, the cool spring and/or the cold winter. A number of orchards in the Toowoomba/ Blackbutt region will have less than 10% of their 2002 crop in 2003.

The uncertainty on production levels highlights the need for the industry to develop a crop estimation/forecasting system. The draft report on the options for such a system was received prior to Christmas and is being evaluated by the AAGF. It is interesting to note that Dr Jonathan Cutting writes on the same issue in "Avoscene" December 2002. He notes that the NZ and Californian avocado industries that have invested heavily, in recent years, in crop estimation systems are still having problems with accuracy. The Californian estimate was under by in excess of 10% this season. Of interest the amount of fruit involved in their "estimation error" was approximately 40 million pounds (16 thousand tonnes).

As a first step in improving the industry's capacity to communicate with all stakeholders, which will be a critical component of any crop estimation system, a survey form is included in this issue of TA and I sincerely ask that you make the effort to return the form ASAP.

Russell Proudfoot has recently sold his orchard and has resigned from all his positions with the AAGF. Russ made a valuable contribution to the industry in the 3 years he was involved in the AAGF and with the R&D subcommittee and we wish him well in his future endeavours and thank him for his efforts. His replacement on the AAGF Board from the Bundaberg region will be finalised by the QFVG in the New Year.

By Rod Dalton



FROM YOUR FEDERATION

Welcome to 2003 and the Summer Issue of "Talking Avocados". As the New Year begins, we are all hoping for a fresh and profitable one.

Since the last issue I have been busy in the lead up to Christmas, reviewing budgets and communication plans, organising an Avocado Export Development Forum and attending a number of AGMs in which our Federation has a direct interest. It has been a very productive period.

AAGF Export Development Forum ...

In early December the AAGF organised a Forum specifically aimed at export. The Forum was the combination of a number of export intelligence projects that we have funded over the last two years. The reports have been informative and comprehensive, containing numerous options and suggestions that the Australian industry can follow.

Currently avocados are being exported to numerous Asian countries, the Middle East and to European countries such as Italy. Knowing this and armed with the information from completed projects, the AAGF was keen to progress the export issue – a Forum of those exporters, agents, marketing groups, large packhouses, shippers and funding agencies that was held in Brisbane. From that day, a committee for Export Development was established to take this issue forward in its own right.

Review of the "Talking Avocado" Mailing List ...

With this issue of Talking Avocados we have included a form that you must complete to continue receiving Talking Avocados each quarter. This is a constant and on going process that we must undertake to keep costs down as well as ensuring that you receive your copy on time and to the correct address.

All information is kept private and is used only by the Federation and the state associations for industry matters.

Roadshow 2003 ...

The Roadshow is coming to you in 2003. This new initiative of the AAGF will be introduced in the second half of this year.

A series of *day long on-farm expos* will bring to you the R&D of local interest, marketing, machinery displays and Industry issues. Six in total will be held, one in each of the following areas – Atherton, Bundaberg, SE Qld, Mid North Coast NSW, SA and WA.

I look forward to meeting more of you throughout 2003 and working with you to build and grow our Industry.

by *Antony Allen* —Industry Manager

New Readers Welcome

Talking Avocados welcomes the following new readers –

New South Wales growers –
R & E Eggins – Alstonville
K Husna – Woolgoolga
J & K Cole – Newee Creek

Queensland grower –
Heiko Burnett – Herberton

Western Australian growers –
J & J Baily – Narrikup

Please feel free to participate in your industry publication. Your comments and 'Letters to the Editor' are very welcome. Ed.



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Australian Roundup...



However some results have been variable so there is still a lot to learn. We have an average fruit set for 2003 but only those growers who have

adequate water can expect a good crop.

By Allan Ross

Atherton Tablelands - Roundup

Shepard Australia held their AGM on the 27 November 2002 at Mareeba. In the chairman's report, Jim Kochi indicated that early evidence suggested no change in the volume of fruit for the 2003 year. Seasonal factors are the main cause for this.

Shepard Directors are as follows:-

Jim Kochi - Chairman

Sam Collins

Eric Battistin

Daniel Vedelago

Denis Cazzola

Verna De Lai did not seek re election and a vote of thanks for her dedicated efforts was recorded.

Due to the hot dry conditions being experienced there has been a considerable reduction in the insect pressure experienced throughout the Tableland - good news for growers, tough for chemical sellers.

Some 21 Grower/Managers attended a Workplace Health and Safety workshop conducted by Farmsafe Queensland. This accredited course gave participants some insights to the new legislation and the impacts this will have if they fail to comply.

Our thanks to Joe and Betty Massasso for the use of their packing shed for the 2 days.

Some issues to be aware of are as follows:-

- Risk Assessment on Plant & Equipment
- Incident Reports/Records
- Register of Farm Chemicals
- Safe and Compliant storage of dangerous goods
- Hygiene Procedures
- Electrical Act of 1st October 2002
- Access to M.S.D.S. - These sheets are available on the internet at www.pestgenie.com.au
- Compliance with DETIR on R.O.P.S. all wheel tractors post 1981 must have R.O.P.S. fitted. There are some exemptions to this and subsidies are available to off set some of the costs.

By Col Cummings

Mount Tamborine - Roundup

Mount Tamborine has just recorded a reasonable Hass harvest in spite of the driest year since 1902. Some growers who are pruning and using growth regulators are achieving excellent results and it is obvious that these methods need to be used if this industry is to survive on Tamborine Mt.

New South Wales -Roundup

The outlook for the 2003 harvest is shaping up to be a repeat of the 2002 season. For many dryland growers, what was initially

a good flowering is slowly but surely being converted into a poor

crop by this relentless drought. Some scattered thunderstorms have given short-term relief. The long term prognosis, for a continued drier than average season, is of serious concern.

Irrigated growers in the Coffs Harbour - Stuarts Point - Comboyne areas are still holding good crops but are also praying for rain.

Prices in the Sydney Markets have held well for the lead up to Christmas, which means the Central Coast and Nelson Bay growers should enjoy the same good return as those in the north of the state.

Renewal notices for this year's NSW Avocado Growers Association membership will be coming out a little later once the relationship with NSW Farmers Association has been finalised. This process is proving time consuming, but should ultimately lead to benefits for us.

I hope you all had a relaxing Christmas break and all the best for the New Year!

Cheers,

Chris Nelson

South Australian Roundup

The harvest of the Hass crop has been in full swing since October, with one of the best crops seen. Prices have been reasonable. Size generally has been on the small side, though growers with healthy trees have had good size.

The weather has been mixed. Late spring was dry and very windy with December being hot and dry. The week before Christmas daytime temperature ranged from 41C to 43C. This has caused a lot of sunburnt fruit, especially on weak trees, Reed and Gwen.

Growers are saying that though this year is a good one with a good crop and good prices, it will have to be averaged out over two years as there is only a light crop set for next season.

By Colin Fechner





Horticulture 2003 - Bigger than Ben Hur!

Horticulture 2003 is shaping up to be the Australian fresh fruit and vegetable industry's major event of the year. Held on the Thursday 15 and Friday 16 of May with a two-day lead in period, delegates from across the nation will gather at Sydney's Olympic Park, Homebush to discuss industry issues and celebrate its successes.

The Novotel Hotel, venue for the recent meeting of the World Trade Organisation and a number of other international meets, will be the 'meeting place' for this cross-industry gathering of representatives from the nation's fresh produce industry. *Made in Australia* is the conference theme with the focus on Australian issues with Australian speakers.

Horticulture 2003 is being facilitated by the Australian United Fresh Fruit and Vegetable Association or AUF - the umbrella organisation for the Australian horticultural industry. AUF's membership covers the whole produce chain - from growers through to retailers.

Its membership includes state representative bodies such as Queensland Fruit and Vegetable Growers, the Vegetable Growers' Association of Victoria' - in the west, WA Fruit Growers' Association and the WA Vegetable Growers' Association along with national organisations such as AUSVEG, the Australian Avocado Growers' Federation and the Australian

Banana Growers' Council, just to name a few.

The major national retailers Coles Supermarkets and Woolworths are AUF members as are supplier companies such as Amcor Fibre Packaging, Visy Board, CHEP Australia, RMAX and

Kwik Lok. All the central markets are members as well as most of the wholesaler representative state Chambers.

AUF National Executive Officer Col Scotney said that in organizing the national event, "We have dawn on our cross-sector membership to participate on the various conference advisory committees established to oversee the program, sponsorship as well as the interactive promotional activity planned for the Friday morning.

"I believe that a key component of *Horticulture 2003* will be the opportunity to network. Most conferences promote this aspect and it's probably a much overused statement, but I know from experience that the AUF facilitated national conferences have always provided the only vehicle for such wide cross-industry networking.

One of today's top industry executives said recently, "I have met virtually all the key industry people today through attending AUF conferences."

Mr Scotney said the conference program included addresses from some of the Australian industry's innovative personalities - the *movers and shakers*. "Industry issues such as Exposure to outside pests and diseases, GMO's, Water, Mergers and Industry Restructuring were on the program.

"Other program sessions look at *Marketing - How do we measure up?* and *Can we prove Made in Australia is Clean & Green.*

One of the innovative features of *Horticulture 2003* will be the *Interactive Promotion & Marketing Breakfast* held for two hours on the Friday morning. Mr Scotney says that the displays will be thrown open to the media and marketing people to inspect the industry's approach to marketing fresh fruit and vegetables.

AUF has been keen to keep down the cost of attendance at *Horticulture 2003*. "We have deliberately moved away from 5 star accommodation offering a choice of quality 4 and 3 star accommodation. It was good enough for the WTO and Olympic Committee," he said.

Potential delegates will also find that registrations costs are at the lower end of the scale normally applicable for a national conference. "We want to make *Horticulture 2003* attractive to all in the industry and recognize that the often high cost of attending can be prohibitive to many of our members as well as those associated with industry."

Mr Scotney encouraged potential delegates to register their interest now as the venue has a limited capacity. Conference brochures are expected to be available at the end of January or early February.

To register your interest contact the Conference Organisers - Acclaim on Phone: 07 3254 0522 or Email: acclaimsemm@bigpond.com

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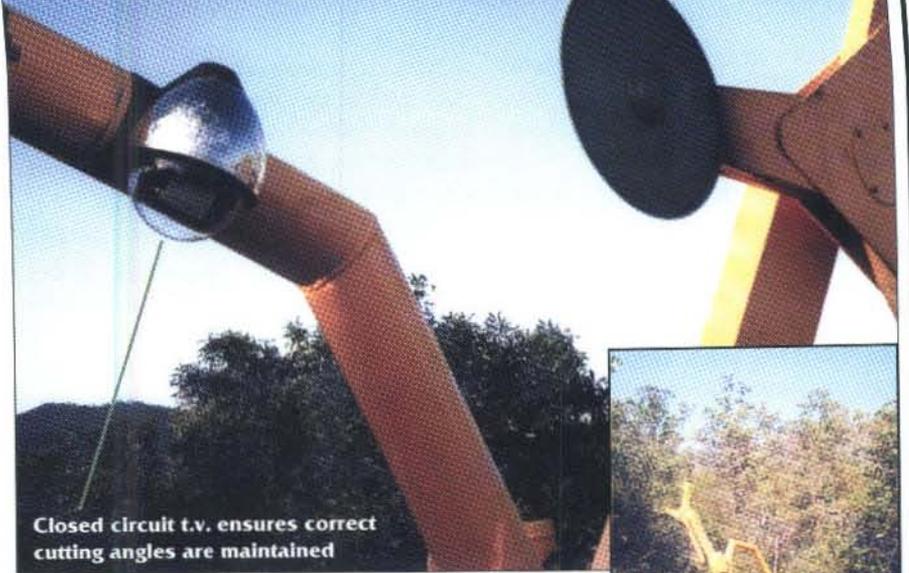
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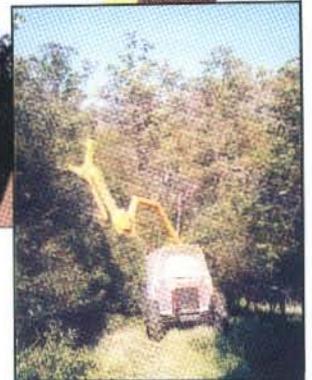
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Pesticide Residues - Past to Present

"Most man doe wholly cut away as much as is fretted with canker or worms, and then dresse it, or wet it with cowes pisse & vinegar, or cowes dung and urine, & c. untill it be killed" John Parkinson 1629

This is the advice from the media guru in the early 17th Century. Fortunately, control strategies have become a little more sophisticated!

It is very easy to get involved in the cut and thrust of the day to day environmental and food safety issues and forget how much has been achieved by the fruit and vegetable industry in reducing pesticide residues. Looking back into the past sometimes put issues into perspective.

Immediately before World War II, a grower's pest control arsenal consisted of a few chemicals - chemical, such as hydrogen cyanide [HCN], nicotine sulphate, petroleum oils, sulphur, derris dust, Bordeaux mixture and lead arsenate. Some very toxic, environmentally unfriendly, difficult to apply and, often, not very effective. Spray equipment was unsophisticated, labour intensive and, again, not always effective.

The result - a large number of fruits and vegetables with external blemishes, post-harvest rots, reduced shelf life and up to 20-40%, sometimes more, of produce with pest damage. It was really a case of the buyer beware!

There was an old saying when eating an apple: "It's better to find a whole grub in the apple than half a grub".

Modern synthetic chemicals arrived immediately following the war and what a change for growers. Pest control in the order of 98-100%, much easier handling, mixing and application of the chemicals with vastly improved plant coverage, post-harvest rot control resulting in improved shelf-life and produce virtually blemish-free. Is it any wonder that these new chemicals were so readily accepted, particularly after hundreds of years of inadequate and, often, ineffective pest control.

The consumer could now get good looking and quality produce.

As with any new development some problems began to arise leading to major adjustments by growers and Government. Community and industry groups became concerned about the effects of some of the more persistent chemicals on the environment and non-pest organisms; the development of pest resistance to many

chemicals; impact on the short and long-term health of workers; pesticide residues in produce destined for both local and overseas markets and the problem of spray drift onto non-target areas.

During the 60's and 70's pesticides residues, above the legal limit, were found in 20-30% of produce and posed a major threat to the acceptance of Australian produce, both domestically and overseas.

The rise of consumer and environmental groups; increased funding by industry and government of research and advisory programs on pest and crop management strategies; development of appropriate pesticide, environmental, occupational health and safety, as well as food safety legislation by State and Federal Governments; implementation of educational and training programs by Government and industry is leading to a more exciting and sophisticated approach by growers to pest control on the farm and the production of fresh produce almost free of residues.

Legislation is becoming more and more stringent driven by greater concerns by the fresh produce industry and community about food safety, environmental matters and worker safety.

More information is required for the registration of new pesticides; old chemicals are being reviewed; residue levels are being reassessed; storage, use, application and disposal of pesticides are being strengthened to protect workers and non-target areas and, the environmental effects of pesticides are being examined more closely by regulators and acted upon in areas of concerns.

Training in the safe and effective use of pesticides through accredited training courses have been pushed vigorously in all States by industry, educational bodies and Government. Also, some State Governments are moving to bring in legislation making training compulsory for growers and employees.

Training educates growers in the proper use of pesticides, ensuring residue-free produce. Many thousands of growers and their staff have undertaken chemical training in all States.

In Victoria, the Northern Victorian Fruit Growers Association has had over 90% of its members accredited.

State and Federal Government departments and funding bodies, such as Horticulture Australia Limited, have invested millions of dollars in undertaking research and advising growers on the implementation of pesticide management strategies. Pest management uses a range of control methods, ranging from the simplest removal and/or exclusion techniques to complex computer programs. Pesticides are just another tool in these sophisticated programs.

Some of the specific projects are in the realm of science fiction. Large scale rearing of millions of sterile males for mass release; synthetic sex scents for attracting and confusing the opposite sex of pest species; plant breeding and genetical modification for pest resistance; pest prediction computer programs and, anti-pest cultural and physical management are just a few of the methods being developed and implemented. Many of these strategies have been extended from the individual farm to be regionally or crop-based.

The question is whether the combination of more stringent legislation, industry training and pest management is effectively in reducing pesticide residues in fresh produce? This is also the question asked by consumers.

The proof of the pudding is in the results of the various pesticide residue monitoring programs carried out by industry by itself or in combination with State and Federal Government. Monitoring surveys are a check on the chemical residue levels in fresh produce and, to date, results show Australian produce is as safe, healthy, and of equal quality, to any in the world.

In New South Wales pesticide residue monitoring has been undertaken since 1989. The survey financed by NSW Agriculture and Sydney Markets Limited has had excellent results in 2000-2001 with 97.6% of produce meeting the stringent legal levels for residues.

The small number of samples above the legal limit were just above and present no

health problem to consumers. The produce from all over Australia is bought from the market floor and is tested for over 25 different chemicals.

Victoria recently published results of its 2000-2001 survey showing 99% of samples tested were within the legal limits. As well as the general survey, Victoria undertakes a statistically designed program on specific crops. To date, asparagus and nectarines have been sampled with 99.9% of asparagus and 100% of nectarines meeting the legal limit.

South Australia undertakes a similar survey to NSW in which specific crops are targeted. In other words the sampling is undertaken on the most susceptible crops during the time when pests are most active. This type of sampling tends to find more violations than in random sampling programs.

The survey, a cooperative effort between Primary Industries and Resources SA, Department of Human Services and Adelaide Produce Markets Limited, Pooraka, found in 2000-2001, 98.5 % of produce sampled were within the legal limits. Again, results similar to NSW and Victoria.

On an individual industry basis, the onion, macadamia, pecan and apple and pear industries undertake monitoring in association with the Australian National Residue Survey, Department of Agricultural Fisheries and Forestry - Australia. Again, the results for 2000-2001 are excellent with 100% compliance in onions, pecans, and macadamias and 97.9% in apples and pears.

A more recent survey, FreshTest, has been instigated by the Australian Chamber of Fruit and Vegetable Industries, with recent results [98.0%] similar to those found in the other surveys.

Excellent results and good news for consumers!

Whilst there has been a significant achievement in reducing pesticides residues to today's high level of compliance, industry can't afford to relax. Food safety, including pesticide residues, is still a major concern of consumers.

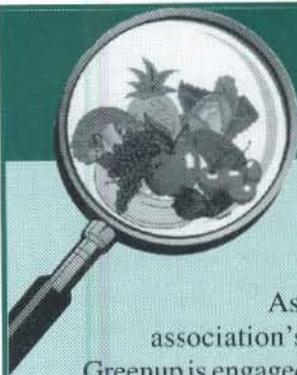
Surveys show consumers want reassurance about the safety of the food they purchase and will stop buying specific produce if they perceive a food safety problem. To the consumer any residue is of concern regardless of whether it's above or below the legal limit.

Consumers will continue to demand increasingly higher standards which they perceive as necessary for themselves and their families. The fruit and vegetable industry must continue its excellent work towards meeting the consumers' needs by incorporating quality management systems based on environmentally aware pest management strategies coupled with pesticide residue monitoring programs.

By Lawrie Greenup - Consultant, Fresh Produce Watch

Fresh Produce Watch - Management Committee

Eric Kime (SML) Chairman;
Col Scotney (AUF) Secretary;
Richard Bennett (HAL);
Bill Chalk (Australian Chamber);
Brendan Nolan (QFVG);
Vacant (NSW Farmers).



What is Fresh Produce Watch?

Fresh Produce Watch was established as a number of years ago as a Project of the Australian United Fresh Fruit and Vegetable Association Ltd or AUF.

As part of AUF, Fresh Produce Watch is based at the association's National Office at the Sydney Markets. Lawrie Greenup is engaged as a consultant to Fresh Produce Watch. The industry 'watch dog' is supported by a growing number of national and state bodies through sponsorship. Fresh Produce Watch Sponsors are as follows' -

- **Adelaide Produce Markets Limited**
- **Australian Apple & Pear Growers' Association**
- **Australian Chamber of Fruit and Vegetable Industries Ltd** comprising - Brismark, Chamber of Fruit & Vegetable Industries of Western Australia, Fresh State, NSW Chamber of Fruit & Vegetable Industries, Newcastle Chamber of Fruit & Vegetable Industries, South Australian Chamber of Fruit & Vegetable Industries
- **Australian Fresh Stone Fruit Growers' Association**
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- **Australian Vegetable and Potato Growers' Federation**
- **Association of Banana Wholesalers**
- **Brisbane Market Corporation**
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- **New South Farmers Association**
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- **Queensland Fruit & Vegetable Growers**
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Rootstock Improvement for the Australian Avocado Industry

By A.W. Whiley, *Sunshine Horticultural Services Pty Ltd*

Productivity of fruit tree crops is known to be intrinsically dependent on the choice of rootstock, whether it be either their ability to resist diseases or to impart greater productivity to the scion. The apple and citrus industries are clear examples where fruit production has been improved by the development of rootstocks that in many cases are specific to scion and soil types. With citrus, it has been shown that rootstocks can influence fruit quality through impacting on rind thickness and pulp recovery.



The domestication/commercialisation of avocado as an orchard crop has occurred in relatively recent times (early 1900's) and the genetic development of the crop is still in its infancy. In all countries where avocado is grown, production has relied on the propagation of superior varieties onto seedling rootstocks. In most cases the latter have been selected for the wrong reasons, e.g. availability and good performance in the nursery.

Examples of poor rootstock choice by industries include the selection of 'Topa Topa' and 'Mexicola' in California which have since been shown to have high susceptibility to *Phytophthora* root rot; 'Edranol' in South Africa which also has been shown to have high susceptibility to *Phytophthora* root rot; 'Mexicola' in Chile where *Phytophthora* root rot is likely to cause significant damage in the future; and 'Zutano' in New Zealand where due to partial graft incompatibility with 'Hass' it is likely to negatively impact on biennial bearing.

Rootstock selection in Australia has had greater diversity than most other industries due to the significant population of mainly Guatemalan race seedlings, a legacy from trans-Pacific shipping during the settlement of the country. However, this has led to the "restaurant run" mentality with seedlings from many sources mixed through our orchards with no performance data or traceability. This wide diversification is reflected in variation of tree performance within our orchards which lessens our ability to effectively manage production and fruit quality. However, the upside from this genetic smorgasbord is the

opportunity to identify high performing trees and to recover and re-propagate their rootstocks.

Field records have shown as much as a 400% difference in production over a six year period between the highest and lowest producing trees in an orchard while recent research in eastern, subtropical Australia has conclusively demonstrated the effect of rootstocks on the potential for 'Hass' fruit to develop anthracnose rots during storage and ripening. There is little doubt that research into improving the genetic composition of rootstocks used by our industry has the potential to make significant advances in avocado production, both from the yield and fruit quality aspects. However, results will not come quickly due to the time taken between tree propagation and fruiting.

The Australian Avocado R & D committee has recognised the potential value of investing some of the available research funds into rootstock improvement and a project to investigate the issues was commissioned in 2002. The objectives of the project are to establish a population of 'Hass' and 'Shepard' trees grafted to various rootstocks grown as either seedlings or clones (the latter to improve genetic stability) in the major production regions of Australia. The performance of these trees will be monitored over a number of years.

While cloned rootstocks should impart benefits to our industry they will be more expensive to purchase due to higher production costs. While cloned 'Duke 7' is extensively used

in California and South Africa there is no published information quantifying the benefits of using this technology. Hence this project will make comparisons between seedling and cloned populations so that growers in the future will be fully informed enabling better choices to be made. The Rootstock Improvement project also aims at investigating nursery technology to ensure that all ANVAS nurseries have access to cost-effective production systems so that they are able to offer high quality trees to growers at competitive prices. This article presents results from an avocado seed germination study that was conducted within the project during spring 2002.

The Rootstock Improvement project provides the opportunity to identify and recover rootstocks from high performance trees in grower's orchards. These can be trees that consistently carry above average crops or have remained healthy in blocks that have been affected by *Phytophthora* root rot. If such trees occur in your orchard and you wish to participate in this project please contact Tony Whiley on (07) 5441 5441 or by email at whileys@bigpond.com

Avocado Seed Germination

Seed of many crops respond favourably to scarification treatments e.g. many indigenous Australian species require heat (fire) before they will germinate. Avocado seed often germinate slowly and irregularly, which can be due to either their postharvest treatment or the seedling line chosen. This trait can have a negative impact on nursery efficiency as considerable time may be invested sorting through seed over a long period of time. Uniform lines of seedlings resulting from similar germination times will also improve the efficiency of handling during the propagation process.

Several studies have been made at different times on pre-treatment of avocado seed to improve germination where it was found that either cutting a slice from the top of the seed or removing the seed coat would initiate faster and more even germination. However, not all investigations reported improved seed germination and there is little data available comparing the various pre-germination treatments.

When the author visited nurseries in South Africa, Chile and the USA during 2002 it became obvious that few indeed were using any type of seed treatment and there was little consistency among those that were practicing seed scarification. In consultation with ACW (an avocado nursery and orchard in California) the following experiment was designed to test the effectiveness of pre-germination treatments on avocado seeds. Trials were conducted in California during May to August 2002 using freshly harvested 'Reed' seed and in Australia during October to December 2002 using freshly harvested 'Kidd' seed (a seedling Guatemalan from the former property of Alec Kidd, Tamborine Mountain).

Treatments

In each of the experiments fruit were harvested and allowed to soften before seed was extracted from the flesh. In the Australian experiment pre-germination treatments included: (1) untreated seed were planted as the control with the seed coat intact; (2) removal of a 5 mm slice from the top of the seed; (3) cutting the seed longitudinally in each quarter from pole to pole to a depth of 5 mm using a Stanley® knife (4 cuts); (4) cutting the seed longitudinally once from pole to pole to a depth of 5 mm using a Stanley® knife (1 cut); (5) hot water treatment of the seed to 50°C for 30 min (as for *Phytophthora* root rot control); (6) seed coat removal.

Treatments were replicated 10 times with 10 seeds in each replication. Seed were planted in a composted pine bark potting medium which was irrigated with overhead misters to maintain moisture. A TinyTalk® logger was used to monitor the temperature in the germination medium for the duration of the experiment. Germination was judged to have occurred when a shoot emerged above the surface of the germination medium.

Results and discussion

The temperature in the germination bed ranged from 14-36°C over the duration of the experiment with a mean temperature of 24.4°C. The germination results are presented

in Fig. 1 (page 12). Ten weeks after planting there were significant differences between all pre-germination treatments and the untreated seed. Approximately 32% of the untreated seed had germinated compared with about 64% of seed that had either been hot water treated or had single pole to pole side cut. Germination improved to 70% where the seed coat had been removed and to about 88% where seed had either been cut 4 times from pole to pole or had 5 mm sliced off the top.

Results from the Californian experiment with 'Reed' seed after 10 weeks were very similar to those reported above with the highest percentage germination occurring in seed that had been either side cut four times quarter from pole to pole (about 96%) or where 5 mm had been sliced from the top of the seed (about 96%). Heat treatment (about 93%) had the next highest germination rate followed by seed coat removal (about 80%) while untreated seed (about 59%) had a significantly lower germination rate compared with all other treatments.

The results from both of these studies conclusively demonstrate the benefits of scarification of avocado seed that has been freshly extracted from the fruit. However, further studies are warranted where scarification treatments are applied to seed following cool storage. There may also be benefits from combining scarification treatments such as tip removal or side cutting with seed coat removal or hot water treatment.

cont. pg. 12

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Another Mechanical approach to Canopy Management

Staghorning of mature avocado trees has been an approach to canopy management which has been used for many years. One of the disadvantages of the approach has been the cost, in time and effort, of cutting down the large trees and either removing the debris from the orchard or preferably mulching the material within the orchard.

Grantham Orchards recently utilized some large machinery to staghorn a block of large Hass trees that had been severely affected by frost.

A "groomer" mounted on a 24 tonne excavator was used to mulch the trees where they stood. The machine, which in simple terms consists of a large flail mulcher mounted on the end of the excavator arm, converted the tree to woodchip.

This woodchip was spread over the block by the action of the groomer. A nurse leader was left on all trees in an effort to encourage flowerbud development in 12 months rather than the normally expected 2 seasons after staghorning.

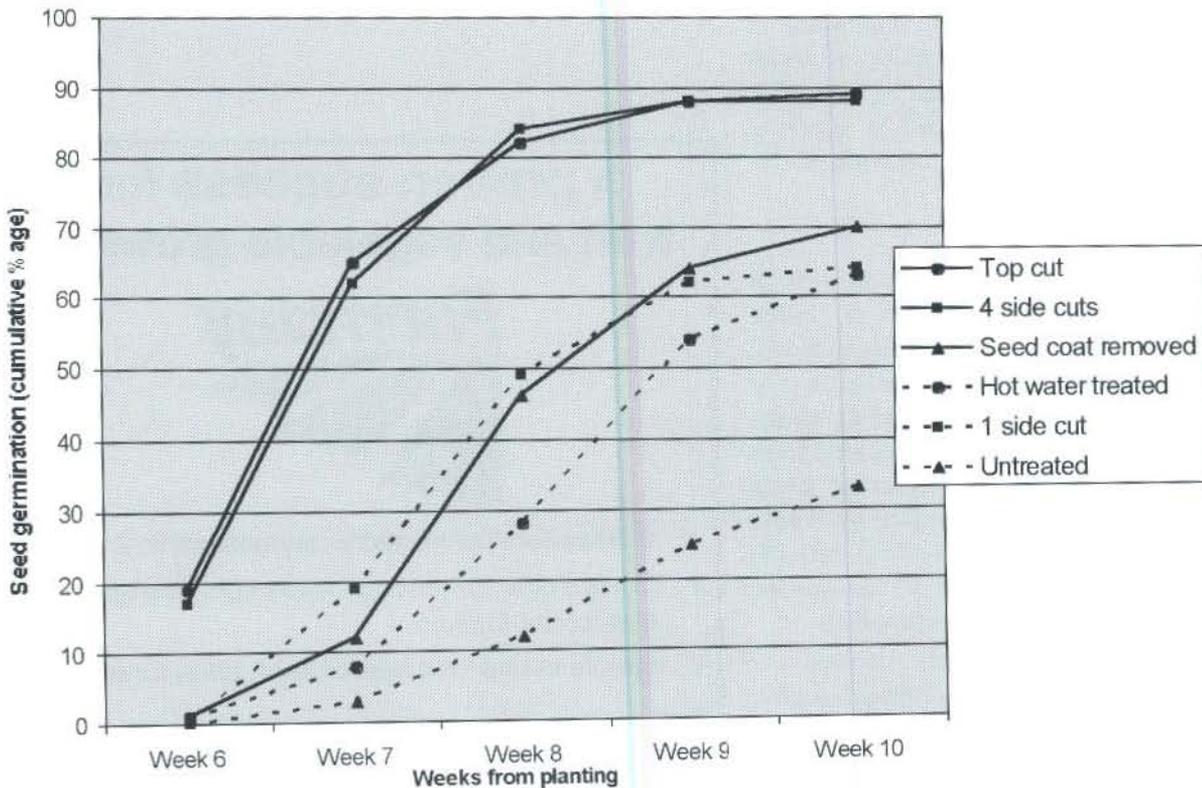
The cost per tree was less than \$20, including the cost of trimming the stumps by hand with a chainsaw. Previous experience with removing trees using chainsaws and stationary mulching machines at a cost of in excess of \$50 per tree make this system particularly attractive.

By Rod Dalton

cont. from pg. 11

Fig. 1: Percentage germination of 'Kidd' seed following various scarification treatments. The experiment was conducted at Anderson's Nursery, Duranbah, NSW

Avocado Seed Germination Study - 2002



Acknowledgements

The author thanks Harold Taylor, Rick Dorland and Graham Anderson of Anderson's Nursery, Duranbah, NSW for their assistance with the Australian trial and Reuben Hofshi and Dr Mary Lu Arpaia of California for their valued collaboration.



The machine in action on a large tree.



A tree stump following staghorned prior to being tidied up with a chainsaw.

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Bruising in 'Hass' avocados

This report summarises the findings of the small project called "Bruising of 'Hass' avocado from harvest to the packhouse" (project number AV02015). The project was funded by the AAGF, HAL and QDPL.

The Australian avocado industry has had a strong focus on improving fruit quality for many years because of concerns of inconsistent fruit quality offered to the consumer. A recent project (called Avocare) funded by the Australian Avocado Growers Federation (AAGF) and Horticulture Australia Ltd (HAL) confirmed that inconsistent fruit quality is still an important issue, and that most of the flesh damage is caused by rots and bruising. Bruising can be present in fruit dispatched from the ripener and from the distribution centre of the retail chains, and in fruit displayed on the retail shelf. During the Avocare trials a form of bruising was identified which could have resulted from impacts to very firm fruit (at or soon after harvest).

In a separate project, similar symptoms were observed in fruit obtained from the end of the packing line (Hofman, internal DPI report). The work of Ledger and Barker (1995) did not test bruising of fruit at or soon after harvest, based on the common assumption that fruit are very resistant to bruising at harvest. There is a need to determine if harvest to packhouse practices cause bruising in order to justify any changes to practices during these stages.

Therefore, this project obtained fruit from a cooperative packing house (called the Cooperative) which sourced fruit from growers up to about 300 km from the packhouse. It was assumed that the operations represented average industry practice in relation to the potential for bruising during harvest and transport to the packhouse. Sample fruit were obtained before placing on the packing line, then ripened and assessed.

The current library tray system at the Cooperative was modified to ensure that the methods used would confirm whether or not flesh bruising in 'Hass' avocado could be caused by harvesting or transport practices.

20 fruit per consignment were sampled during placing on the creep feed at the start of the packing line. This allowed random sampling of fruit from all depths in the bin. The fruit were ripened in an air conditioned room at 18-22 °C. At the eating soft stage (stage 5 in the Avocare quality assessment manual; White et al., 2001), the fruit were cut longitudinally in quarters, the peel removed and each quarter diced into four pieces. The severity of bruising was rated using the scale of 0-3.

A total of 185 consignments (that is, either different growers delivered on the same day, or the same grower delivered on different days) were analysed from early May to late July.

The project obtained results from early May to end July. The results are summarised in Table 1, and the detailed results presented in Figure 1.

The results are presented as the percentage of fruit in each consignment with any level of bruising, and the percentage of fruit with more than 15% (rating of 1.5) of the flesh with bruising. About 7.4% of all the fruit had some level of bruising (Table 1). However, bruising severity was generally low (less than 5% of the flesh volume affected), with only 0.6% of the 3700 fruit having more than 15% of the flesh volume with bruising. About 45% of all consignments had one or more fruit

with some level of bruising, but only 10% of the consignments had one or more fruit with more than 15% of the flesh volume affected by bruising.

Most of the bruising was light in colour (Plate 1). The "cracking" bruising noted in previous Avocare surveys and other trials was not common.

To try to get some indication of the effect of distance from orchard to packhouse on bruising, the orchard location for each grower was grouped into 6 districts, as listed in Table 2. The bruising incidence was then averaged across all growers and consignments in each of the six districts.

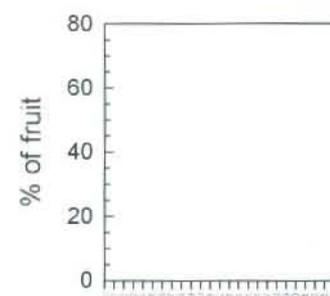
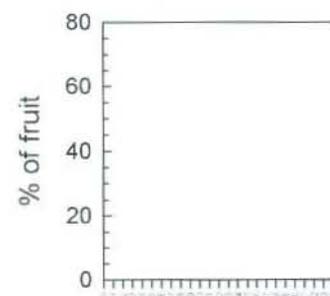
The results indicate statistically significant effects of growing region on the level of bruising. The pattern of more bruising in fruit from more distant regions is not always consistent, but does suggest that the transport distance between the orchard and the packhouse may be a contributing factor to the incidence of bruising.

The incidence of bruising was higher in consignments sampled after 7 June (Figure 1). However, it is difficult to determine if this is a maturity factor, since the consignments were from growers in several production districts with different times to reach commercial maturity, and the number of consignments sampled per grower was not sufficient for statistical analysis.

Several fruit consignments (shown as the black bars in Figure 1) were harvested from severely frosted orchards in early July. Frosted fruit can start to ripen and soften on the tree. Only obviously firm fruit were sampled for the library trays, but despite this, these lines often showed more fruit bruising than other lines. Therefore, it is important that frost-damaged fruit are harvested as soon as possible to ensure that they have not started to soften before harvest. Placing ripening fruit through the harvesting a packing system could increase bruising.

Conclusions ...

The results indicate that bruising can occur before packing if current harvest and transport practices are not maintained or improved, or if frost damaged fruit are not harvested quickly. Therefore, it is important that impacts to fruit are reduced as much as possible during harvest to packing. Current practices should be either maintained or improved to ensure that bruising does not increase.



Sampled 13 May

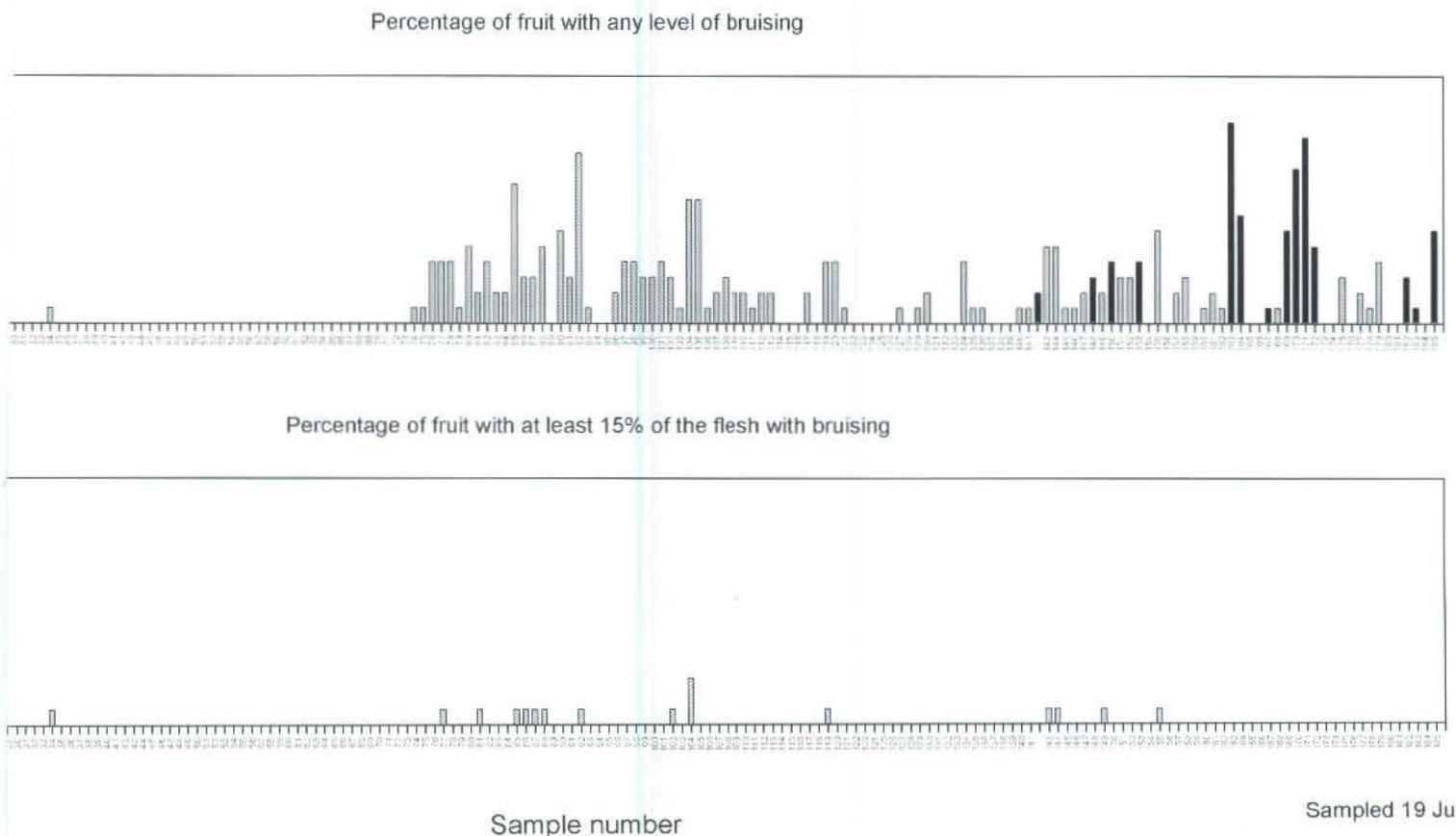
Table 1. The percentage of fruit across all consignments, and the percentage of consignments (one consignment is from different growers on the same delivery date, or different delivery dates from the same grower) that had any level of flesh bruising, and the percentage of fruit that had at least 15% of the flesh volume with defect. About 3700 from 185 consignments of fruit were assessed.

Flesh bruising	Percentage of fruit or the percentage of consignments with:	
	Any level of bruising	More than 15% of the flesh volume with bruising
Percentage of fruit	7.4	0.6
Percentage of consignments	45	10

Table 2. The average bruising incidence (the percentage of the fruit with any level of bruising, or the percentage of fruit with ore than 15% of the flesh affected) for growers in the same district means in the same column with different letters are significantly different at a probability level of 5%. There was no statistical treatment differences for more than 15% of the flesh with bruising.

Orchard Location	No of growers in the district	Percentage of fruit with:	
		any level of bruising	more than 15% of the flesh with bruising
Nambour	7	5.8 ^{ab}	0.5
Beerwah/Glasshouse/Maleny	11	4.6 ^b	0.5
Peachester/Gympie	2	3.6 ^{ab}	0.3
Kilcoy/Gatton	4	10.4 ^a	0.8
Blackbutt/Hampton/Toowoomba/Maryborough	6	7.0 ^{ab}	0.5
Bundaberg/Childers/Duranbah	9	8.3 ^a	0.9

Figure 1. The percentage of fruit from each consignment (different grower or different delivery date) with any level of bruising, or the percentage of fruit with at least 15% of the fruit flesh volume affected. The consignments are arranged in order of assessment date, from 13 May to 19 July. The black bars represent those consignments that were frost damaged.



cont. from pg. 15

The severity of bruising was usually low. The number of fruit affected was far lower than observed in the Avocare project, when fruit were sampled between the ripener and sale from the retail shelf (about 60% of fruit had some level of bruising, and about 20% of fruit had at least 10% of the flesh affected).

To further reduce the level of bruising in the fruit on the retail shelf, it is suggested that work should focus on reducing bruising after packing. This needs to be done in close association with transporters, ripeners and retailers, to identify where and how bruising is occurring, and develop practices to reduce bruising.

Thanks ...

Thanks to Barbara Stubbings and Matt Atkins from DPI for technical support, Shaun Peters and Bryan Raphael from Natures Fruit Company for advice and library tray assessments, and Janet Giles for statistical support.

By Peter Hofman

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Plate 1. Typical bruising symptoms noted on ripe fruit. The "cracking" bruising (lower right) was not common.

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Consultants give the thumbs up for R&D program

Last year Horticulture Australia, in conjunction with AAGF, commissioned an independent review of the avocado R&D Program. Although anecdotal evidence has indicated that the program has been delivering significant benefit for industry, we were keen to have an independent objective assessment.

We are pleased with the results which confirm the previous investment has been very effective. More importantly, we wanted to find out if there are ways we can improve the program and maximise the benefits that it delivers.

Although the review has provided very positive feedback, it has provided some recommendations about how we may be able to improve. The R&D Committee and the AAGF Board will be considering the review report in detail when they next meet.

The full report, which is very comprehensive, is being published and will be available through HAL. Below is a summary that has been prepared by the consultants which highlights some of the key findings.

John Tyas - Program Manager, Horticulture Australia

Effectiveness of the Avocado R&D Program Review of the Effectiveness of the Avocado R&D Program

A study conducted by Harley Juffs & Associates Pty Ltd for Horticulture Australia Ltd

The study was conducted during the period July – November 2002 and was funded by matched industry levy funds.

The Australian avocado industry established a national R&D levy through the Horticultural Research and Development Corporation (HRDC) in 1992. Through this mechanism, the industry currently invests approximately \$700,000 - \$800,000 annually (including matching funds provided by the Commonwealth Government) in R&D relevant to the avocado industry. Horticulture Australia Ltd (HAL) now manages the R&D program.

In July 2002, HAL commissioned a review - Project AV02014 - to determine the benefits that the industry has obtained from its investment in R&D via the levy to date, in both economic and qualitative terms. Other issues, such as the quality of the research, balance of the program, expertise available, linkages and relationships and overall planning and management of the program, were to be also assessed. The review team was required to make recommendations for consideration by AAGF and by HAL.

All relevant project proposals and reports, and a sample of extension materials were reviewed. Most researchers and research managers, a representative sample of growers from all regions, several nurserymen and some managers and directors of supply chain organisations were interviewed.

All HAL-funded avocado projects that were in progress during the period 1991-92 to 2002-03 inclusive, other than those of a management nature, were considered. Projects for which part or all the industry's component of the funding mix was provided via a voluntary contribution were also considered. A total of 65 projects meeting these criteria had been funded during this period, representing a total investment in avocado R&D of \$5.05 million (industry funds plus matching funds).

Providers of services

The Queensland Department of Primary Industries (QDPI) was, by a wide margin, the largest provider of HAL-funded avocado R&D, attracting about 65% of the total funds during the period under review. Much of QDPI's avocado work has been applicable nationally.

Of the other State agencies, the Department of Agriculture in Western Australia has been the most active, attracting 3% of the funds. The NSW Department of Agriculture has provided extension input only in recent years, but is interested in re-entering the research field with the support of HAL funding. The South Australian and Victorian state agencies and CSIRO have not provided any input into avocado R&D or extension in recent years.

The benefits of investment in R&D

The reviewers were unable to conduct a comprehensive quantitative benefit cost analysis of the effectiveness of the industry's investment in R&D. This was because the necessary quantitative data were not available at the industry level nor, in the vast majority of cases, at the grower level.

Nevertheless, it was concluded that the Australian avocado industry has been generally served well by its R&D program administered by HRDC/HAL since 1991-92. Broad indicators of success in this regard include:

- A significant increase in the annual national production of avocados, with industry expansion continuing;
- Recognition by the major supermarket chains that avocados have become one of their best performing fresh produce lines;
- General satisfaction of growers - the main stakeholders - with the outcomes that the program has delivered to them (supported by anecdotal evidence of specific benefits); and
- Anecdotal evidence that the avocado industry's R&D program - in terms of management, strategic direction and output - compares very favourably with those of other horticultural industries.

Staffing of R&D

The staffing of the research effort by the institutional providers is inextricably linked to industry funding. Given continuity of industry funding at reasonable levels, the main government

agencies – QDPI, NSW Agriculture and the WA Department of Agriculture - will continue to provide the necessary core staffing in proportion to that funding.

Under these circumstances, the industry can be reasonably confident that relevant expertise will be available from its core providers in the short to medium term, and probably for the longer term as well, to meet its needs. Additional specialist expertise will also be available on a demand basis from other providers, such as the universities.

Collaboration

Avocado research in Australia has a proud history of interdisciplinary collaboration and there continues to be a high level of interaction amongst researchers in Queensland, and potentially also in NSW, if projects based there are funded in the future.

One of the clear benefits of the AVOMAN program is that it has provided a framework for the development and implementation of a national approach to avocado extension.

Collaboration at the international level has also been a feature of the avocado research scene, though for the most part this has been on an informal basis and at the individual level.

Balance of the R&D program

The R&D investment has been reasonably well balanced across the industry's priority areas, both as set out in the current strategic plan for avocado R&D and as reported to the reviewers by the industry's stakeholders.

Some growers felt that regional differences in avocado production, reflecting factors such as climate, soils, water quality, water management and variety, were not receiving sufficient attention. However, most of these growers also recognised that addressing all of their concerns was difficult, given the limited size of the industry's R&D budget and the distribution and diversity of the production areas.

Planning and management of the R&D program

The present processes are generally working well, with direct grower involvement in the process seen as one of the program's strengths.

The challenge for the next decade

The challenge for R&D in the 1980s was to make the breakthrough that would allow the development of a stable and commercially viable industry, which at that stage, was still subject to the ravages of *Phytophthora* root rot. In the 1990s, the challenge was to add value across several well-defined areas of research.

However during the next decade the challenge is likely to be somewhat different, with the central issue being effective management of a plethora of complex and inter-related inputs into the R&D process, with the objective of achieving strategic, tangible outcomes.

Major recommendations:

1. **Future involvement of industry in RD&E:** That the avocado industry continues to support an R&D program administered by HAL, supported by a compulsory grower levy and with direct grower input into administration of the program. The industry should aspire to ownership of a world-class R&D system with excellent planning and efficient operational and delivery methods.
2. **Location of the research and consideration of regional issues:** That the present system of centralising core research broadly within southeast Queensland be continued but with greater recognition being given to regional issues and the transfer of research findings to all production regions through the following mechanisms:
 - o Consideration be given, particularly in the crop management area, to the greater use of low cost trials on satellite sites in outlying regions (ie as adjuncts to the trial work on the main site), to be supervised by the core researchers, but with most of the field work carried out by the cooperating growers;
 - o Elevation of more regional issues to the priority list for levy funded projects than at present (but only if they are adequately resourced);
 - o Initiation of a funded program of annual regional field days and/or visiting speakers; and
 - o Support for the establishment (where they have lapsed) and maintenance of discussion groups in all regions.
3. **Approach to the industry's key issues.** That the industry develops and documents a strategy on its approach to each of the key issues facing the industry such as reducing reliance on use of chemicals, control of fruitspotting bug, handling of fruit postharvest and exports, and that implementation of each strategy is project-managed.
4. **Consultation with the supply chain sector.** That a mechanism be established for regular formal consultation between the avocado supply chain sector and the AAGF R&D Sub-Committee be established. This would allow the sharing of mutually beneficial information and the development of an industry-wide focus on strategic issues. A frequency of once annually is suggested.

A similar mechanism could be established for consultation with the nursery sector, though with meetings at less frequent intervals, eg every 2-3 years.
5. **Retaining core R&D resources in the industry:** That the industry seeks to retain the services of a multi-disciplinary team of core researchers and works with its main co-investor agencies on a medium to long term, mutually beneficial, partnership basis to ensure this outcome.
6. **Extension.** That extension projects continue to be supported by levy funds. However, the various elements of the extension program need to be handled as an integrated, complementary package, with elements deleted, added or improved as appropriate.

Ten minor recommendations and numerous comments are included in the project report.

Areas of R&D nominated by growers as being of most benefit to them.

Most of the 30 growers interviewed were able to nominate several areas of research activity - on an anecdotal basis - from which they had gained a benefit. Of the 24 areas of research activity mentioned in this regard, six areas accounted for about 65% of the mentions. Commencing with the most frequently mentioned, these areas were:

- Field application of phosphonate for control of *Phytophthora*;
- Canopy management / pruning;
- Use of Sunny plant growth regulator;
- Postharvest fruit quality;
- AVOMAN; and
- Treatment of boron deficiency.

The 24 areas of research activity nominated by the growers as having been of benefit to them spanned a wide cross-section of the industry's research portfolio.

Areas nominated by growers as requiring more research input.

The growers interviewed nominated 37 areas that they considered require more research input than at present, with a total of 107 mentions. Slightly more than 50% of the mentions were related to the following issues:

- Reducing reliance on the use of chemicals for control of pests and diseases;
- Postharvest fruit quality including handling and quality right through to the point of consumption;
- Selection of superior rootstocks, but targeted to more production areas and with more varieties than under the present project;
- Fruitspotting bug;
- Canopy management, with a national focus;
- Plant nutrition; and
- Regional field days, discussion groups and visiting experts.

However, in contrast to the above, very few mentions were made of areas requiring less research. One grower nominated fruitspotting bug in this regard. Another grower suggested greater use is made of imported technology as a possible means of getting greater value from the R&D levy.

Managers of the industry's R&D program thus have some difficult choices in attempting to satisfy their stakeholders' expectations for research outcomes under the present funding arrangements.

Talking Avocados as a source of information on R&D issues by growers.

Talking Avocados has clearly been a very successful medium for conveying the results of industry-funded research to growers. All of the 30 growers interviewed read the magazine to some degree: 23 (77%) extensively, four (13%) selectively and three (10%) lightly. Twenty-five (83%) kept copies of the magazine for future reference. Unsolicited comments about the magazine ranged from 'Good' through to 'Excellent'.

Twenty-one (70%) of the growers stated that they had changed one or more practices on their farm at least partly as a result of reading about it in Talking Avocados.

Many growers still have a clear preference for receiving information about research projects in a hard copy, printed format.

Use of AVOMAN by growers.

Of the 30 growers interviewed in this study, only 10 growers were using AVOMAN in any way at the present time. Each of these 10 growers was using the Help file, though often to only a limited and declining extent. Five growers were using some (but not all) of the AVOMAN records. Only one of the growers was using all of the records.

AUSTRALIA TO DEVELOP - EXCELLENCE IN FOOD SAFETY

Agreement has been reached to establish an Australian Centre of Food Excellence in Food Safety and Integrity.

"Food safety is the number one issue for domestic consumers, as well as overseas consumers and food buyers," the Managing Director of the National Food Industry Strategy, Richard Brooks said.

"It's the pre-requisite for entry into both the domestic and global supermarket and is not negotiable."

Mr Brooks said that food safety and integrity relates to production systems, handling, storage, transport and display of food to cover the food chain from 'paddock to plate'.

"If Australia is to build its reputation for a 'clean and green' image," he said, "we need to remain at the forefront of innovation and R&D in the important areas of food production, processing, packaging, transport and services.

"The Centre in Food Safety and Integrity will help build a high degree of consumer confidence in the quality and safety of Australian food."

The proposal to establish the new Food Centre of Excellence is one of a suite of measures under the National Food Strategy which aim to increase Australia's commercialisation of innovation within the food industry. It is the second centre to be agreed, following agreement in September to a Centre for Human Health Functionality of Foods.

The Strategy is overseen by a Council, chaired by Federal Agriculture, Fisheries and Forestry Minister, Warren Truss, and comprising leading industry experts and five other Commonwealth Ministers.

Mr Brooks said the Centre of Excellence for Food Safety and Integrity would work to consolidate and build a critical mass of expertise into existing food safety research in Australia, as well as attracting new skills. The work involves new approaches to risk management of food safety and new preservation technologies.

"The new Centre offers the potential to improve food safety without adverse impact on taste, freshness, nutritional value or production efficiency," he said.

"If we are to improve our global market share in food exports, we need to be able to prove the safety and international equivalence of food production technologies to the world food-buying community.

"This is an exciting and important initiative," said Mr Brooks. "Consumers want the latest technology applied to food safety standards and they want to be assured about the integrity of those standards."

Mr Brooks said it offers significant opportunities to expand Australian food processing technologies to maintain a competitive edge for Australian food.

The food industry accounts for 22% of sales of Australian products overseas and food exports were valued at \$26 billion last financial year.

The Commonwealth Government has provided funding of \$102 million over five years to the industry-led and managed National Food Industry Strategy to develop a range of initiatives aimed at improving Australian food capacity and quality and export growth.

For further information, please contact:

*NFIS Media and Communications
National Food Industry Strategy Ltd
Level 3, 55 Blackall Street
BARTON ACT 2600
Phone: 02 6270 8800
Fax: 02 6273 1718
Email: nfismedia@nfis.com.au
Web Site: www.nfis.com.au*

ANVAS Accredited Nurseries

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Duranbah Road, Duranbah NSW
Phone: 02 6677 7229

Batson's Nursery

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

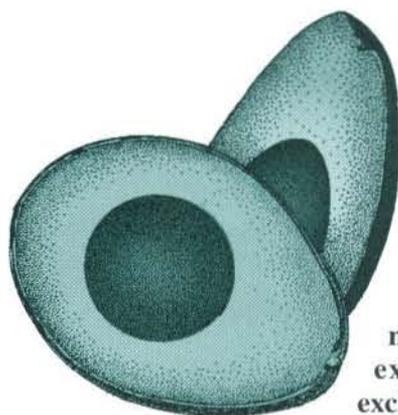
Birdwood Nursery

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

Rainforest Nursery

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

World Congress in Spain



Brush up your Spanish and develop a taste for tapas, because the World Avocado Congress is being held in Spain in 2003. From October 19 to 24 2003, you could be in the trendy tourist town of Torremolinos, enjoying mild weather, sandy beaches, exclusive shopping and exciting nightlife – as well as the congress of course!

And actually, you won't need too much Spanish, as the official languages of the congress are both Spanish and English with simultaneous translation.

Organisers say it will cover all aspects of the avocado industry, with scientific sessions on genetic resources, cultivar and rootstock breeding and selection, cultural practices and integrated management, ecological cultivation, physiological aspects of flowering, fruit set and development, pests and diseases, marketing, industrialisation and legislation, as well as human nutrition and health.

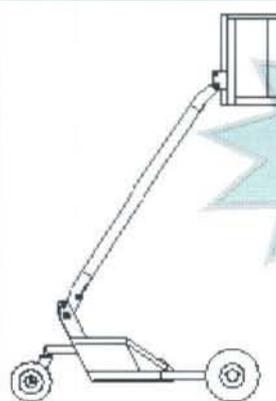
They've packed heaps into the five days, mostly starting at 8am and going through until 7pm, with social events to follow, including folk dancing, and a banquet on the last day. But there'll be plenty of time to sample tapas and other Spanish specialities with nice long lunch breaks from 1pm to 3pm.

The town is packed with bars and restaurants, tantalising shops, and thronging with people of every nationality. Located right at the heart of the town is the pedestrian-only 'Calle San Miguel' - a street where buskers, street vendors and tourists converge to create a unique ambience.

The old part of the town has mercifully survived the passage of time and is recommended for those who seek a slice of real Spain.

The New Zealand Avocado Growers' Association with the support of the Australian Avocado Growers' Federation Inc are organising a "pre congress" package tour, which will include a couple of days in both Los Angeles and Frankfurt before arrival in Spain. Once the congress is over, tour members will be free to make arrangements for extended holidays if they wish. Indicative costs are AUD\$3,300.00 ex departure from Auckland.

Please contact: Penny Hawley at the NZAGA offices to register interest in joining the tour party and to obtain further details. Pennyhawley@nzavocado.co.nz; PO Box 16004, Bethlehem, Tauranga, NZ.



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The Avocado: Botany, Production and Uses
CABI Publishing 2002

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Wayne Prowse

Avocado Promotions...

By Wayne Prowse

New Zealand adopts

"ave an avo today"

New Zealand has adopted the "ave an avo today" theme for their promotions in Australia this season. Used with our permission it is good for reinforcing the message to consumers that avocados should be part of a daily diet.

New Zealand Avocados were in many east coast stores during December, mixed with netted product of smaller avocados mostly sourced from SA. WA fruit was also in east coast as well as SA and WA markets.

A strong demand for NZ fruit, providing the quality is maintained will help set the season up for the start of our Greenskin season in February.

Public Relations

We are gearing up for a season launch with the food media and planning a luncheon at an avocado plantation in an area close to Sydney for late April. Whilst this area will not be producing fruit at the time, it will be an opportunity to showcase fruit from other areas in a plantation location, close to Sydney, where we can invite a larger number of media people.

This exercise is valuable in establishing and maintaining good relationships with the food media writers and encourages them to include more information about avocados in their magazine and newspaper articles.

TV Advertising

The next burst of TV advertising is scheduled for Brisbane from late March through to Easter then, followed by other major markets from mid June through September. The exact details of the TV schedule will be discussed at the Marketing Committee meeting in February and will, of course, be subject to the projected crop flow to ensure maximum impact when the advertising is needed most.

Market indications to date show that the advertising is having a lasting, positive impact on avocado sales and consumer usage.

Export promotion in Germany - Fruit Logistica

Australian Avocados will again be promoted at Fruit Logistica in Berlin 15 - 18 January. Horticulture Australia, under the "Australia Fresh" banner, will be promoting a range of stone fruits, citrus, macadamia nuts and avocados at the largest trade exhibition for fresh produce in Europe.

This is part of the export strategy to raise export demand to 4,000 tonnes by 2006. Participation at these events raises the number of leads and aims to place European buyers in contact with Australian exporters so that business can be done.

We are also planning to take Australian avocados to HOFEX trade food trade exhibition in Hong Kong in May and interested exporters should contact Wayne Prowse at Horticulture Australia.

Marketing Committee

The next Marketing Committee will meet 25 February. Growers wishing to raise items for consideration should contact Antony Allen at the AAGF. a.allen@aagf.org.au

Fresh Produce Manual

Handling & Storage Practices for Fresh Produce

Australian United Fresh Fruit & Vegetable Association (AUF) has recently released the long awaited, updated third edition of its

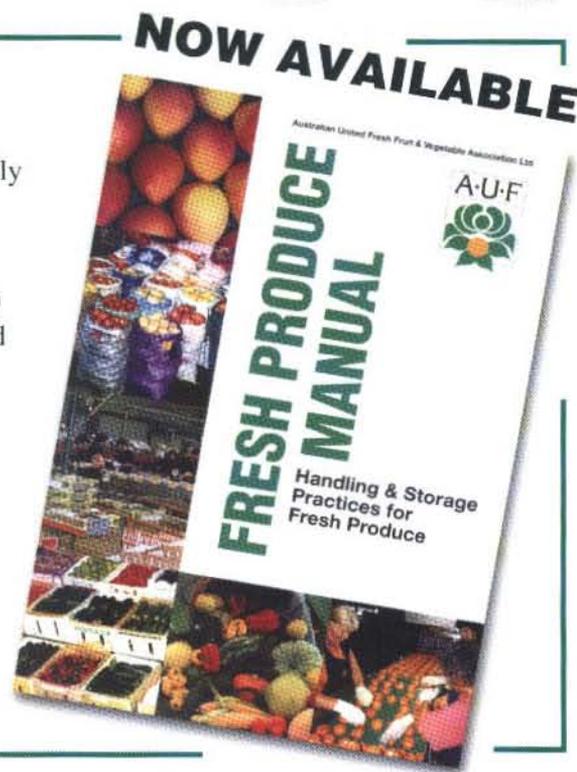
Fresh Produce Manual

Updated by well-known industry consultant Anne Story, the acclaimed 160 page publication covers Quality and Quality Management, Food Safety and HACCP, Temperature Management, Humidity, Post Harvest Treatments, Controlled and Modified Atmospheres, Supply/demand Chain Logistics and Transport, Product Management and much, much more.

The reference publication is a MUST for growers, transporters and wholesalers involved in Quality Assurance and Food Safety programs.

The *Fresh Produce Manual* is available for \$120.00 including GST and P&H from:

AUF at PO Box 82, Sydney Markets NSW 2129
Phone: 02 9763 1767, Fax: 02 9746 3003 or
Email: auf@iprimus.com.au



Fruitspotting bug pheromone research continues

By Geoff Waite, Principal Entomologist, Maroochy Research Station

Many growers will recall that in 1990-91 I hosted Dr Jeff Aldrich during a 6-month sabbatical he spent at Maroochy Research Station. He is now head of the 'Chemicals Affecting Insect Behaviour Laboratory' at the USDA Beltsville Laboratories, Maryland, USA. Dr Aldrich's expertise is in the semiochemistry of insects i.e. the chemicals that insects use to communicate with one another and to find mates and host plants.

The aim of the project was to investigate fruitspotting bug pheromones and if possible to synthesise them and attempt to use them in traps for monitoring purposes. We determined that the males of each species produced a unique blend of chemicals that were not observed in the females. This was consistent with previous findings in relation to other true bugs, where the males produce the pheromones rather than the females, as is the case with Lepidoptera (moths and butterflies) and other insect orders.

Most of the components of the pheromone blend were identified at the time, but one of the major components for *Amblypelta nitida* remained unknown because it was a 'new' chemical, for another 8 years or so. Dr Chris Moore of QDPI in collaboration with the University of Queensland Chemistry Department eventually identified the compound myroxyde, which interestingly is now used in perfumes (Firmenich Inc., Switzerland). My interest in fruitspotting bugs has continued, since they remain a critical pest not only for avocados and macadamias but for Queensland horticulture generally. A major 3-year industry-funded research project on 'The Ecology and Behaviour of Fruitspotting Bugs' was completed in 2000.

Dr Aldrich has in the meantime, developed new techniques relating to electro-antennogram investigation of the reaction of insect antennae to chemical signals. He was keen to test the reaction of female fruitspotting bugs to some extracts from males that he had recovered in 1990-91 and had stored frozen, in his laboratory.

In September 2002, while enroute to Mexico, I visited the 'Chemicals Affecting Insects Laboratory' where discussions on various subjects relating to insect semiochemistry took place with Dr Aldrich and his staff. With respect to bug pheromones much interesting work continues, and some practical attractants have been developed and commercialised through this laboratory eg. The 'Attractor' trap for a common North American predatory bug. This device is used to attract beneficial bugs into backyard vegetable gardens to control caterpillar pests.

It was interesting to find that the current thinking in this laboratory parallels my own with respect to the possible involvement in the attraction and orientation process of insects generally, of host plant volatiles. In addition to pheromones and repellent odours, insects produce many other chemicals such as those used in defence and for marking occupied plant niches.

Dr Aldrich has found that when bugs walk on a leaf surface, they leave 'chemical footprints'. The chemical involved in the case of the green vegetable bug, *Nezara viridula*, has been identified as squalene. Egg parasites of the bug use this chemical to find the bug and then their eggs. This substance is obtained in quantity from the livers of deep-sea sharks and is sold commercially as a health tonic!

Insects continually present surprises such as this, which makes the study of their chemistry both exciting and puzzling. The secret to finding a useful tool amongst all of this will be to hit on the correct combination of the various chemical compounds produced and present them to potential attractable bugs in an environment that will facilitate maximum effect.

The aim of the research conducted during my visit was to subject live antennae, excised from female fruitspotting bugs, *Amblypelta nitida*, to aeration extracts stored in Dr. Aldrich's freezer for 12 years. This was done via an electro-antennogram setup (AEG)

linked to a Gas Chromatograph and computer. Dr Aldrich's technician, Dr Aijun Zhang, has refined the AEG procedure to make it more sensitive. It also enables real-time comparison via the computer, of the antenna's reaction with the trace of the chemical components of the test blend.

With the aid of a stereo-microscope, an antenna was excised from a live female bug using fine forceps. The antenna was then attached at each end to two pure gold electrodes bathed in saline solution to prevent the antenna from dehydrating. The electrodes bearing the test antenna were then connected to the EAG apparatus in line with the Gas Chromatograph and computer. The chemical blend was introduced into the line and puffed over the antenna with as little delay as possible after amputation so that the antenna retained its sensitivity and remained fully receptive.

Only two runs of the AEG were conducted since the quantity of available fruitspotting bug-derived material was small. We needed to keep some in reserve to run through the Gas Chromatograph-Mass Spectrometer to confirm the actual chemical make-up of the blend after such a long period of storage. However, one run was sufficient to create quite a deal of excitement in the laboratory, for it revealed a nice 'blip' on the AEG that coincided with the GC peak for myroxyde, the chemical discussed in the introduction.

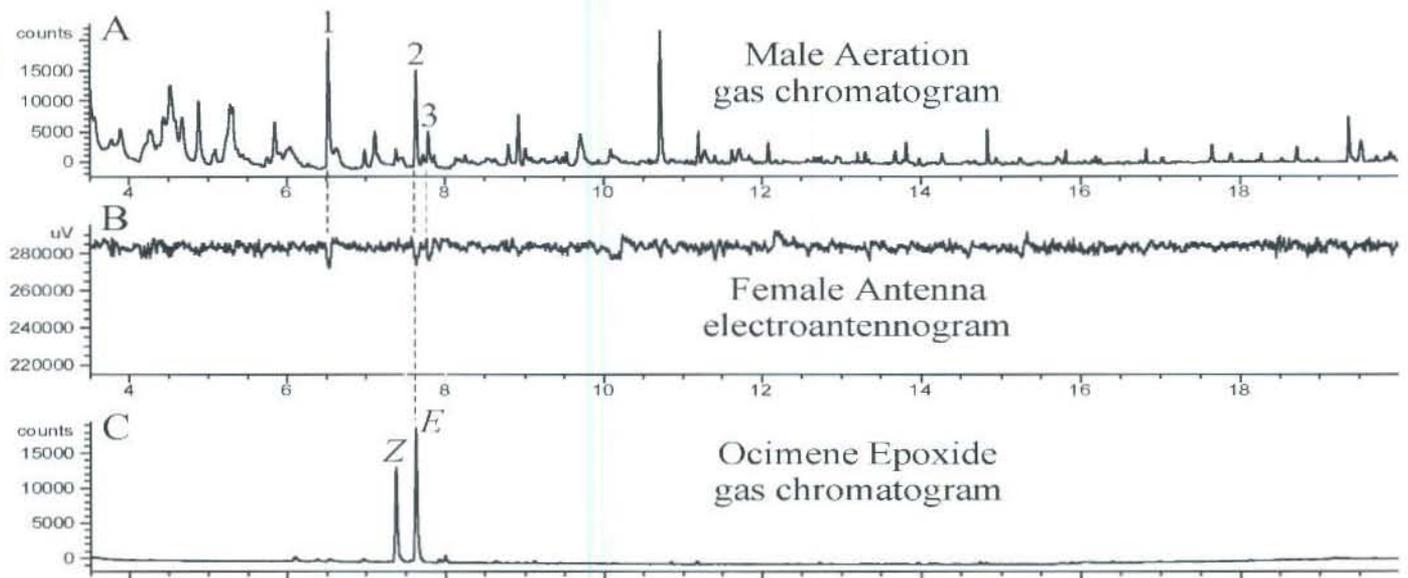
The relevant graphs for each of the sensory devices have been combined in **Figure 1** (page 24). In deciphering the peaks and troughs that appear on each of these graphs, the experience of the operators in this laboratory was critical in determining what was useful and meaningful data.

For instance, it is obvious that there are many peaks on the male aeration chromatogram. Similarly, the electroantennogram displays a constant array of background activity, some of which might be interpreted as being significant.

To the trained eye, only the reactions coinciding with the peaks marked 1, 2

cont. pg. 24

Figure 1: **A.** Gas chromatogram of aeration extract of *Amblyopelta nitida* males (60m DB-WAXetr; 80 °C for 2 minutes to 250 °C at 10 °C/min, hold 10 minutes). **B.** Electroantennogram detection using *Amblyopelta nitida* female antennae. **C.** Gas chromatogram of a synthetic standard of beta-ocimene epoxides ('myroxyde', Firmenich Inc. Switzerland).



and 3 on the aeration chromatogram are to be noted because of their peculiar form compared with other 'blips', and also because they relate to chemical compounds of the type that occur in insect pheromones.

The ocimene epoxide gas chromatogram (aligning with peak No. 2) shows the active E-isomer (myroxyde) has caused a definite reaction in the antenna. There are also two other positive reactions (peaks 1 and 3) in response to two other chemical compounds in the bug aeration extract.

The computer chemical database match has identified these as the aldehydes, nonanal and decanal, both of which are readily available commercially. Nonanal is one of the chemicals identified in the original 1990-91 research, but decanal was not apparent then. Because we had no identification for myroxyde at the time, it was not possible to synthesise a test blend. The exposure of the presence of decanal and its activity in this instance highlights the value of this technology in identifying compounds that could be part of a pheromone and that may also be critical to the delivery of the correct message to other bugs.

Outcomes and implications ...

The results of this research indicate that our claims in respect to the possible source and nature of the identified chemical compounds from *A. nitida* are supported. The chemicals produced by

one sex are recognised by the other. Only the males produce these compounds and the female antenna is stimulated.

Unfortunately, there was insufficient product available to check the reaction of the male antenna, but this needs to be done when the opportunity arises. The immediate course of action will be to synthesise a blend of myroxyde, nonanal and decanal and test its attraction to the bugs when exposed in the new plastic 'football' traps now being used at Beltsville. These are on their way to Maroochy from the USA.

In order to facilitate further work on determining actual component ratios, which may be critical for the proper function of the blend as a pheromone, further aerations of male bugs will be conducted in the Maroochy laboratory during the coming summer when bugs are available in the field. These extracts will be forwarded to Beltsville along with live bugs for testing, if import permits can be obtained. Otherwise, this phase may be postponed until September 2004 when Dr Aldrich will be in Brisbane to attend the XXII International Congress of Entomology.

We anticipate that he will be able to stay on to conduct further fruitspotting bug research. To get this far has taken 12 years of unfunded research and continuous commitment to a positive result. I hope that it will not take another 12 years to develop a useful monitoring tool!

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QFVG says —

“Wage increase puts more pressure on growers.”

At the close of 2002, “The Queensland Industrial Relations Commission’s decision to apply the minimum wage to all employees will only bring further hardship to fruit and vegetable growers already buckling under the effects of drought,” says QFVG.

Queensland Fruit & Vegetable Growers is appalled that the decision to increase the Fruit and Vegetable Growing Award was made when farmers were battling with the worst drought in more than a century.

The representative body for Queensland fruit and vegetable growers says that the decision would see wages in the fruit and vegetable industry rise by \$23.80 a week and, added to an increase earlier in 2002, a \$40 per week raise in six months. QFVG Chief Advocate Mark Panitz says, “This is an increase of about 10 per cent. Wages are the major expense for farms, contributing about 50 per cent to the overall costs of production.

“Where are farmers supposed to find this money? Many of them are struggling to keep their farms and now their expenses have been raised even further.

“There’s a bitter irony that when many of our members are asking for assistance through programs such as Farmhand and applying for exceptional circumstances support from governments, the Commission chose to increase their costs even further.

He said, “This decision is simply not sustainable for the industry and shows a lack of understanding about how horticulture works.”

The new ruling will apply from 1 April 2003.

“Even if the drought has broken by then, which is highly unlikely, it will take many farmers years to recover. This decision will put them even further behind and is likely to result in job losses,” Mr Panitz said.

He said growers, unlike other industries, could not continue to absorb costs forced upon them.

“Currently, growers do not have the ability pass on costs and that needs to change. While production costs have increased dramatically during the past 10 years, there has not been a corresponding rise in the price they receive for fruit and vegetables.

“As a result, they are facing a profitability squeeze. This wage decision is not good for them or the State’s economy.

“Of course, this problem is exacerbated by the relentless drought,” Mr Panitz said.

Mr Panitz said QFVG would, through its representative body, file an application with the commission to have the Fruit and Vegetable Growing Industry Award made exempt.

On 18 December, the Full Bench of the Queensland Industrial Relations’ Commission ruled that from 1 April 2003, the Queensland Minimum Wage of \$431.30 be applicable to award rates which are currently lower. This includes the *Fruit and Vegetable Growing Industry Award – State*, which currently has an adult weekly wage rate of \$407.60.

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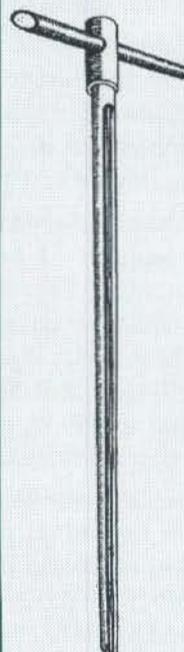
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New AVOMAN – easier to use & more powerful

By Simon Newett for the AVOMAN team

“Much easier to use even better than the old version
browsers are great new reports are just what I need”.

These are just some of the comments from growers who have seen some of the planned changes to AVOMAN at recent training sessions.

Major update ...

The anticipated release date for the new version is now autumn 2003. Originally planned as a minor update (with a major one to follow in 2004), the decision was made to carry out important modifications now so that growers gain the benefit sooner. The changes also now include suggestions generated by growers during the recent training sessions.

This will be the first major update since release of the first commercial version in 1998.

Planning Group ...

Training and feedback sessions held around the country between August and October were well received and generated a lot of ideas. Subsequently a small Planning Group made up of large and small growers and the new Industry Manager, Antony Allen, was formed to review ideas with team members and decide on areas of priority.

The first meeting was held in early December and as a result it was decided to go ahead with additional new features not originally planned. The group decided that the benefit of the extra features would outweigh the extra time needed to develop them.

Existing records will transfer into the new version ...

Your own AVOMAN records will be automatically updated to be compatible with the new version when you install it.

Survey results ...

The following features were the most popular requests by growers surveyed:

- Greater flexibility in the program
- Ability to review records more readily

- More compact and summarised reports
- New reports and more flexibility with reporting
- Recommendations up-dated with the latest technology
- Help files updated and with more pictures
- Fruit traceability
- Easier to read spray diary which caters for new endosulfan requirements
- Yield and pack-out recording easier to use.

The main thrust of the update is to make AVOMAN easier to use, more flexible, keep up with the times and make it more powerful as a management tool.

What's new? ...

From the moment you open the latest version, you'll realise that much of the way it looks and operates has been updated. In keeping with modern trends in software technology, the traditional main toolbar has been replaced with an Explorer style menu tree that gives you fast and easy access to each of the many sections of AVOMAN.

Many growers who have seen and used the latest version at training sessions have commented on how much simpler and quicker these trees are to use (Figure 1, Page 28).

Also included up front in AVOMAN are a number of handy new features. Growers who are new to avocado production can refer to a crop calendar, which lists typical management activities that should be undertaken from month to month to successfully manage their farm.

For those who like to be reminded when it is time to do pre-planned activities, from fertilising or tractor servicing to family birthdays, there's a task list facility where you can schedule reminders for any type of activity.

Browsers ...

One of the most popular of the new features are the 'browsers'. Browsers can show you all the records you have saved at a glance and provide 'filters' which allow you to very quickly find the specific records you want.

For instance, the Jobs browser lists all the jobs you have ever recorded and allows you to then 'filter' the list based on one or more of its properties including: Block, Chemical or Fertiliser used, Pest or Disease targeted, type of Operation (eg. foliar spray, fertigation, irrigation), Employee responsible and Date.

For example (see Figure 2, Page 28) you may wish to find out the last time you applied a spray for Anthracnose on a particular block. To do this you simply select the block and anthracnose from the drop down lists in the filters provided.

Without typing a letter and with just a few a few clicks of your mouse, not only can you see the last time you sprayed for anthracnose, but optionally who did the spraying, how much time it took and how much the whole job cost. Of course anything you can see in a browser can be printed in a hard copy report.

Electronic reports for emailing and analysis ...

You can also produce electronic versions of reports that can be sent to customers or others via electronic mail if you wish. For those who like to analyse their data in different ways, you can also export reports for use in popular office software programs such as MS-Excel and MS-Word.

New reports ...

The AVOMAN team has produced a range of new reports. These include:

- An easier-to-read spray diary that provides all the information required by auditors of food safety schemes (including all the information you must record when using Endosulfan)

- Fertiliser and Irrigation summaries
- Consignment note to accompany your fruit or be emailed or faxed to your agent
- Water management graph that shows rainfall, evaporation, irrigation and tensiometer readings on the same chart
- A report that compares productivity and production costs between different blocks
- Yield reports and bar charts comparing yields between blocks or across years

New recommendations ...

The recommendations grid has been expanded to allow a longer period to be displayed, making planning ahead easier. For those using AVOMAN to manage their nutrition, it is now easier than ever to find fertiliser products and rates to match elemental requirements. A Sunny® recommendation replaces the old Cultar®, recommendation, the nitrogen recommendation has been expanded to incorporate the needs of young trees and the root rot recommendation has been updated to incorporate new information.

Help files ...

A major update and expansion of the already comprehensive Help files has been undertaken, including more pictures to allow easier diagnosis of pests and disorders.

Other new sections ...

A section has been incorporated to record root phosphorous acid values. There is also a facility to pre-record templates (eg. details to accompany records of endosulfan applications) for use in the notes fields.

Greater flexibility ...

The new version is more flexible and customisable. For example as well as everything that could be customised previously it now allows you to add your own varieties, locations, types of operation, machinery, fruit grades, tray count sizes, pests and diseases.

Fruit production and traceability ...

A bin harvest facility has been introduced (which should be particularly useful for growers supplying cooperative packing sheds). Tray counts from a pack record can now be copied and linked to consignment records. A traceability chain makes it possible to trace a tray of fruit at the retailers back to the block it was harvested from. The project team has been liaising with major packing sheds to ensure that the AVOMAN system is compatible with existing systems.

For existing AVOMAN users the update will be free. This has been made possible courtesy of the funding bodies which include the AAGF, Horticulture Australia, DPI Queensland, NSW Agriculture and Department of Agriculture West Australia.

For those interested in the software who have not heard from us recently (perhaps your address has changed) please contact the AVOMAN team:

E-mail: avoman@dpi.qld.gov.au

Fax: (07) 54 412235

Phone: Larissa (07) 54 412211

Post: AVOMAN team, DPI,
PO Box 5083 SCMC,
NAMBOUR QLD 4560

Simon Newett,

Queensland DPI Senior Extension
Officer and AVOMAN project leader

cont. pg. 28

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Figure 1

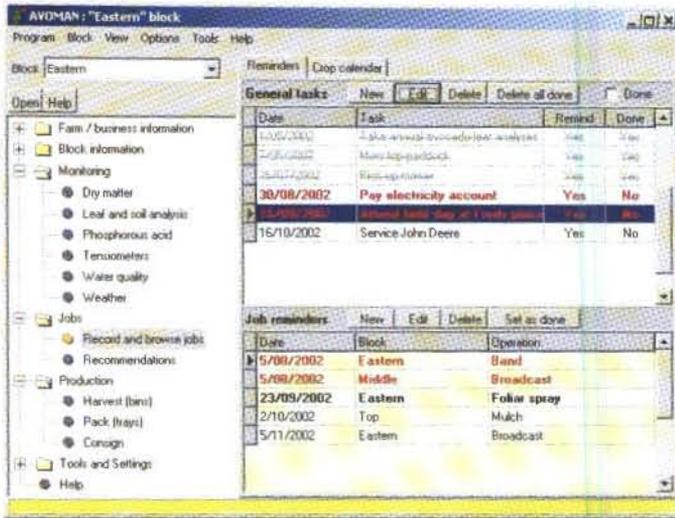
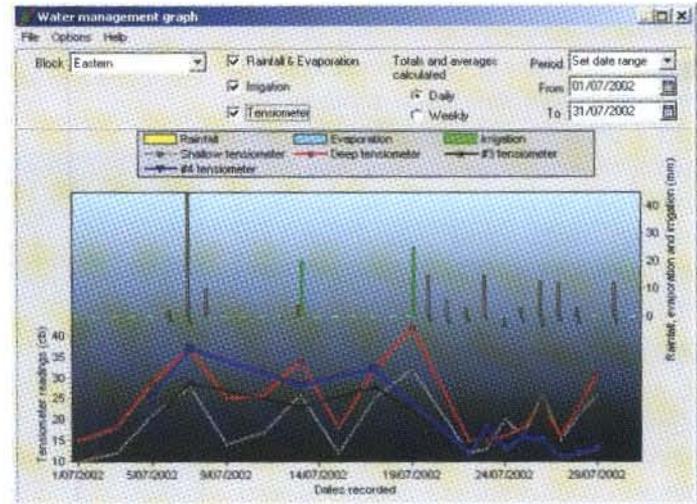
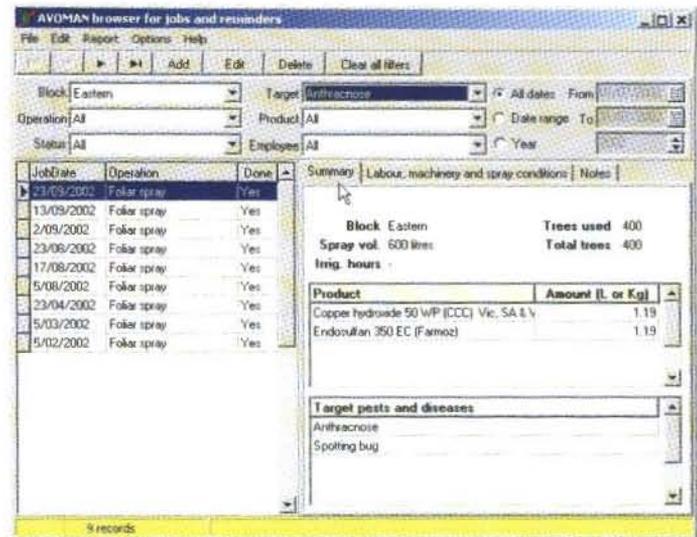


Figure 2



Talking Avocados

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