



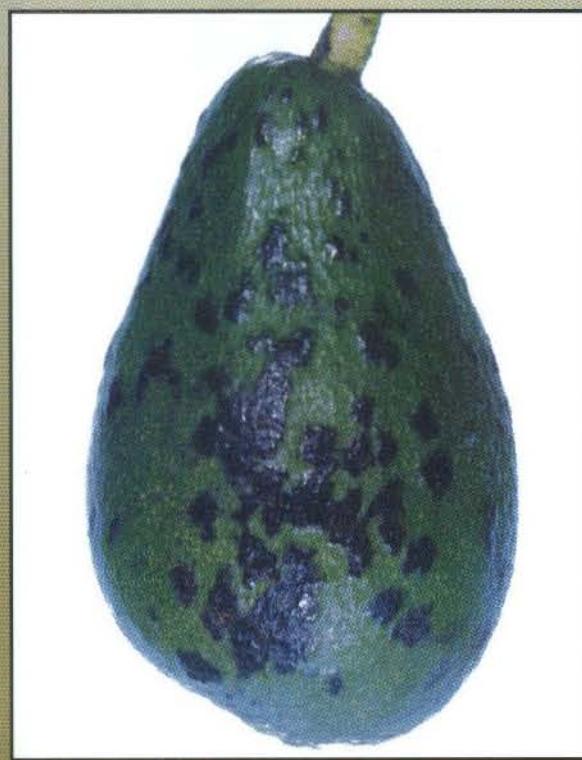
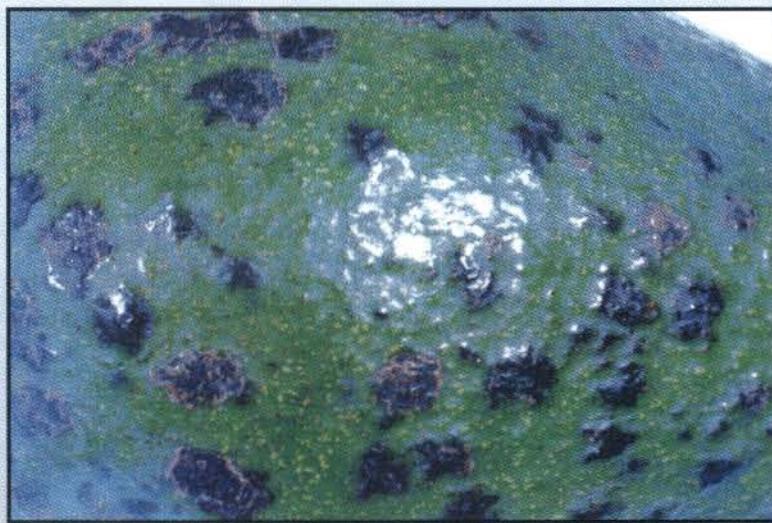
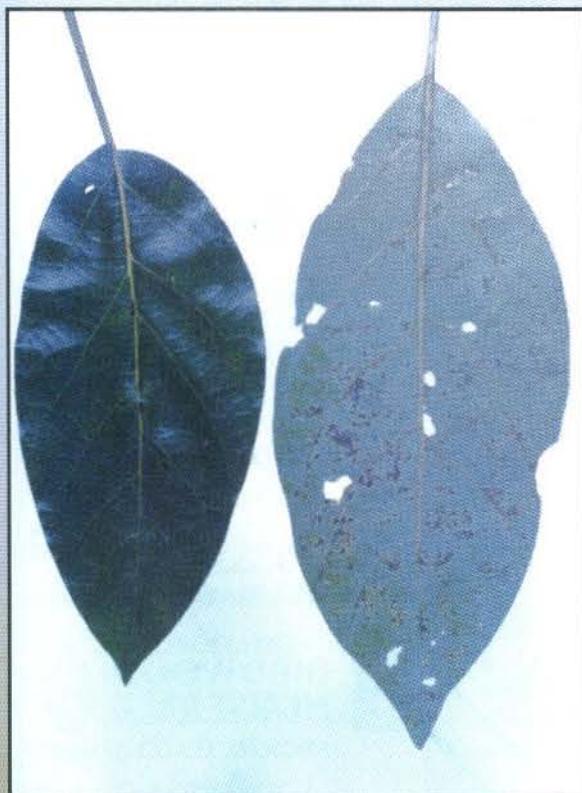
The Australian Newsline

Vol 3 Number 2



Talking Avocados

November 1992



- Cercospora Spot of Avocados
- Conference '92
- Research & Development Plan

*Sincere
Thanks*

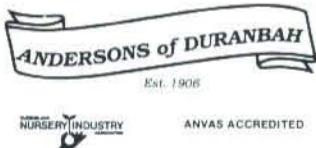
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Conference '92

The avocado industry's Biennial Conference held at the Jupiters on the Gold Coast from September 28 to October 2 was one of the most successful conferences so far held. There was something for everyone.

The Conference was officially opened by the Shadow Minister for Primary Industries and Energy, Mr Bruce Lloyd MP. Attendance figures were 237 registrations, 154 went on the field trip and 174 attended the dinner.

The quality of the speakers, both from overseas and Australia, was excellent with those attending being given much to think about and hopefully act upon.

Many papers presented at the conference will appear as articles in the coming issues of this magazine. This issue already features three papers plus the salient points from the AAGF President's opening and closing addresses.

Congratulations must go to the organisers for a job well done. Also the industry's thanks go to the sponsors who supported the conference, it is hoped that members of the industry will, in turn, support them (see ads this issue).

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Talking Avocados

This magazine does not intend to run a regular editorial, the space could better be utilised by an additional article, especially one of a technical nature.

Having said that, there are some features of Talking Avocados that need pointing out because the magazine needs your support to become a successful publication.

Many of the sections will become regular features, such as Technical, Marketing, World News, Australian Round-up, AHC etc. Other features will appear as interest grows and readers respond, such as Letters

to the Editor, Grower's Profile and individual articles submitted for publication.

Do not lose sight of the fact that this magazine is published for the industry by the industry, and as such it is you the industry that should have the "say" as to the contents. Your support is needed. Ask yourself, what do I want to read? What can I do to improve the magazine? What can I contribute?

Orf Bartrop
Editor

Editor and Publisher

Orf Bartrop

AHC Co-ordinator & Advertising Manager

Sue Bone

AAGF Co-ordinator

Warren Meredith

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All advertising inquiries should be addressed to Ms Sue Bone, Communications Manager, Australian Horticultural Corporation, Level 14, 100 William Street, Sydney NSW 2011. Telephone 02-357 7000 Fax 02-356 3661.

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This publication is distributed upon the understanding that the publisher is not engaged in legal, cultural or other professional advice. Opinions expressed by contributors are not necessarily those of the publisher or the Australian Avocado growers' Federation.

The President Addresses Conference '92

The President of the Australian Avocado Growers' Federation, Mr Robert Mosse, made two noteworthy addresses at the 9th Biennial Avocado Conference. After welcoming the

many guests, speakers and fellow growers, he went on to raise several points of interest to all avocado growers. In his closing address, he summed up the current

industry position and indicated the way to the future. Extracts from those two addresses are given below.



We have covered much ground since our last conference the two most notable being:

1. We have joined the HRDC after a full three day workshop to canvass the merits and work out industry priorities.
2. We joined the AHC after a long agonising and almost soul searching period that also involved a full scale workshop to canvass every possible option.

At both of these workshops, a good many people representing a very broad section of opinion throughout the industry were

Opening Address

involved in the discussions. Their input was invaluable.

We have at last received a "tick of acceptance" from the National Heart Foundation. Late last year Vogue magazine produced a 1992 calendar with special recipes for each month of the year, approved by the NHF. Four of these recipes included avocados and in one of them avocados were used exclusively. This represents a major breakthrough for the industry. The public is now being made aware of the fact that avocados are not only

extremely nutritious and tasty but they also lower cholesterol levels.

None of this could have happened without an enormous effort by the AAGF committee, all of whom worked like beavers for the industry.

Sometimes we need to remind ourselves that these conferences are also organised and run every two years by the AAGF for the benefit of all those associated with the avocado industry. Having said that I hope you all enjoy this conference!

Thank you.

Closing Address

It is a fact of life that we live in a world of power playing and intense lobbying by groups with vested interests. If our industry ignores agro-politics it will very soon feel the effect of the continuous onslaughts being made against the rural communities.

Without a peak industry body recognised as such by Government bodies, growers have no clout and no visible means of exposing their industry. Without a national avocado body we would not have joined either the HRDC or the AHC.

One would suppose that most people would support research and development and yet when we applied to join the HRDC there were objections from growers, directed to Canberra, opposing our application. When it came to the AHC it was much more controversial as you all know—but you can't please everybody.

The Federal Government set up both the HRDC and the AHC and they have similar enabling Statutes. Growers seldom query either the politics or the enabling legislation relating to the HRDC but they want to know everything about the AHC, even though the real object of both these organisations is to promote exports and to improve the balance of payments for Australia.

It is very clear, and this I was told quite categorically in Canberra about a month ago, that if an industry has no intention of ever exporting then very soon that industry will be dropped not only from the AHC program but also from HRDC program. This is something that people don't appreciate.

Exporting, as you know, is a reality for some larger growers. I believe it will become a reality for some of the existing

co-operatives referred to by Don Lavers. Not everyone will be involved, but some larger growers and those organising themselves along co-operative lines will become involved.

Quality assurance is a fact of life and John and Jay Dorrian in their presentation this morning indicated what some individual growers are doing. There are other growers in other sheds in other parts of Australia who are doing similar things and I can assure you that the idea will be means driven and it will have to grow. The New Zealanders have got their act together as far as exports are concerned and are ahead of us in this area.

I was talking to Ron Bailey, the President of the New Zealand Growers Association. He wants us to be able to fill a niche that New Zealand has established in Asia but, at this point, we really do not have the infrastructure to do so. We will have to lift our game and we must start thinking in terms of exports if we are to survive as an industry.

Good marketing is essential and the sale of any commodity requires professionalism, all of which costs money, a great deal of money. In the past, industry marketing efforts were really confined to an ad hoc undertaking by the States. We need to ensure that we have a compulsory levy system.

We have joined the AHC on a trial basis for a period of two years.

I hope that it is going to work because, if it does not, I do not know what other body we are going to create in its place. Some States have legislation by which they can collect levies on a compulsory basis. Queensland has for example.

Queensland is the largest producer both in terms of production and growers. The second largest producer is New South Wales that does not have such legislation. New South Wales can do it by means of a marketing order, similar to West Australia but growers in New South Wales would have to go back every four years and seek a fresh mandate. You know, as well as I do, that if growers are given the opportunity of opting out, they will vote against voluntary levies.

This has been the experience of most other industries. The numbers of those that do pay on a voluntary basis always declines. The fears of compulsory levies from the growers point of view is that their money will be collected and then simply wasted. This will not happen and cannot happen if growers control and determine how their funds will be spent.

I don't have the time unfortunately to give you the background to the AHC but rest assured we have only joined for two years on a trial basis. The committee that currently constitutes the AAGF is very, very conscious of the fact that we need to monitor all expenditure carefully. We did some nail biting and soul searching before we finally decided to join the AHC; and the AAGF committee will monitor, very carefully, the spending of your money.

It is no good me talking in terms of budget this afternoon because, at this stage, we simply have no idea what revenue will be collected. In due course, you will receive this information in a National Avocado Magazine, which is part of the spin-off obtained by joining the AHC. The magazine will be sent to all growers in Australia and will contain not only the

transfer of technical information but also information of general interest and, when relevant, even information of a political nature.

There are a few things that I want to say before I close.

Our biggest problem has been lack of communication within the industry. The new magazine will, I believe, rectify this problem.

We must be constantly alert and monitor all political, social and economic changes affecting our industry. We need to be receptive to technological changes, we even

need to be more proactive rather than reactive in seeking accreditation for new technologies that have already been widely accepted overseas.

I refer to tree injection that started in South Africa. It took off quite slowly in Australia until the industry found out about the technology and utilised it long before researchers confirmed that the process was safe. This happened because it was really needs driven.

We must all stay in touch and this applies equally not only to grower organisations but also to the AAGF and the various

States and Federal bodies. We need to see a diminution of State emphasis among growers and State bodies. More emphasis should be put on a common National approach motivated by a genuine spirit of co-operation and above all else we need to remain united as an industry. In the words of the late Graham Gregory "Unite or perish" and so, in conclusion, and for the benefit of those who like to have a go at me, I give you my last latin quotation for this conference "Ex unitate vires"—from unity strength.

Thank you very much.



LETTERS TO THE EDITOR

Dear Sir,

This year the California Avocado Society's Award of Honour went to Cliff Ranney for his untiring work in establishing maturity standards for Californian avocados.

His work is the result of six years of detailed work by a dedicated group of grower researchers. I have proposed to the AAGF that we should acquire the same knowledge relating to our own much wider climatic zones so that we could predict the time to pick our major varieties. This can only remove guess-work from decision making in trying to maximise returns.

You will be asked to help. Please do.

Ross Richards
Renmark S.A.

Calendar of Events

November

- 16 **Brunswick Branch of the NSW Avocado Association** - meeting Mullumbimby Ex Servicemen's Club commencing 8.00 p.m.
- 19 **Coffs Harbour Branch of the NSW Avocado Association** - meeting Coffs Harbour Catholic Club commencing 7.30 p.m.
- 20 **Richmond Branch of the NSW Avocado Association** - meeting Tropical Fruit research Station commencing 3.00 p.m.
- 20-22 **Seminar for industry proprietors** - Aanuka Beach Resort, Coffs Harbour. The aim is to provide information on the storage, preparation and selling of avocados, bananas, stone-fruit and blueberries. Contact: Warren Meredith 066-541658.

March 1993

- 31 **NSW Avocado Association** - Annual general Meeting.

Personal Profile



Bryson Dyke

Bryson Dyke was recently appointed as Executive Officer/Treasurer to the Australian Avocado Growers' Federation. He has been working with Queensland Fruit & Vegetable Growers for 18 months as an Executive Officer handling the Other Fruits (which includes avocados), Tomato and Citrus Sectional Group Committees.

Bryson was raised on a farm in the Hunter Valley in NSW. After attending Hawkesbury Agricultural College and obtaining post-graduate qualifications in Extension, he spent six years as a Horticultural Extension Officer in the central west of NSW.

Bryson resigned from that position to take up a Training Development Executive position with the Rural Training Council in Perth, Western Australia. After a brief foray into his own direct marketing business, he was appointed Senior Administrator to a National Church organisation.

Bryson looks forward to the challenge of working with the Australian Avocado Growers' Federation to develop and implement their Strategic Plan. He views the industry as one with great potential to be the leader among Australia's horticultural products and to set the pace regarding promotions, quality product and increased consumerism.

Bryson maintains the industry's closeness and ability to work together towards a common goal should be exploited for the benefit of all concerned. He would welcome any input from avocado growers into the operation of their Federation.

Bryson may be contacted by telephone on 07 213 2476, Fax 07 213 2480 or by mail at P.O. Box 19, Brisbane Markets Qld 4106.

Streamlined Sales Tax

New sales tax laws are being introduced as of 1 January 1993. If you are a primary producer, you can now choose to be registered for sales tax purposes and receive a sales tax number. Then, when you buy certain goods for use in your primary production business you can buy them free of sales tax by quoting your sales tax number to your supplier.

This means that you will no longer have to fill out an exemption certificate giving the item in the law under which you are claiming exemption. You simply quote your sales tax number.

Although you can choose whether or not to be registered, your choice will affect how you can buy goods free of sales tax.

To register, or if wish to make inquiries, telephone 132866 (for the cost of a local call) and ask for a copy of the booklet "Streamlined Sales Tax - How It Affects Manufacturers Of Exempt Goods". This booklet contains an application form and all the necessary information you require.

When you send your application for registration to the Tax Office, they will send you a registration certificate and a sales tax number.

If you choose not to be registered you will not be able to buy most goods free of sales tax at the time of purchase. You will still be able to buy some goods free of sales tax but the range of goods will be small.

To buy those goods you will have to quote an exemption declaration in much the same way as you give an exemption certificate (a Certificate A) now.

If you are not registered you will be able to get a credit from the Tax Office for sales tax included in the price of goods that you have bought. However, you would have to wait until you had produced goods and sold them or used them yourself before claiming that credit. The minimum amount of credit that can be paid by the Tax Office is \$200, however, you can add several smaller amounts together in order to reach that \$200 minimum.

Australian Round-up



Recently our secretary sent out letters to several growers who had been paying voluntary industry levies, asking them to join the NSW Association. No sooner did this happen than the Board instructed the secretary to place on hold all applications to join, until we sorted out some seemingly complicated problems concerning membership and our Constitution.

Luckily the problem was not as difficult as first thought, and after receiving some legal advice and a continuing hard look at our Constitution, the Board approved accepting new members.

We have been visited by Richard Bennett of the AHC, at two public meetings, a Field Day at Alstonville and an evening meeting at Coffs Harbour. Richard explained the aims and objectives of the AHC and answered growers' questions. The intention of those meetings was to have a two-way exchange so that we understand something about the AHC and the AHC picks up growers' thoughts and ideas.

Fred Chalker is a well known identity associated with our industry in particular, and North Coast horticulture in general. Fred was for many years the Principal Horticulturist at Alstonville Research Station and before that worked generally among the pioneers of our industry. Fred has now retired to grow tropical fruit. Thank you Fred for your help over the years, may you retire in peace and your silent number remain mute.

On a sadder note, Graham Gregory, the initial Chairman of the HRDC and former Deputy Director General of NSW Agriculture died recently. Graham was one of those senior people who literally kept an open door. There are quite a few people who, wrestling with seemingly impossible industry problems, have been thankful for his knowledge and advice, always given in an understanding and sympathetic spirit. We extend our sympathy to his family.

On a happier note, the biennial Avocado Conference was held earlier this month at Jupiters Casino on Queensland's Gold Coast. In the opinion of the NSW Avocado Association President, it was the best organised so far. An excellent turn up of growers and industry representatives, with good speakers and something to learn for everyone. Congratulations to Robert Mosse and his team for a job well done.

NSW Agriculture, NSW TAFE, NSW Farmers Association, The Banana Industry Council and the Coffs Harbour Branch of the NSW Avocado Association are combining with some help from HRDC to run a seminar for industry proprietors at the Aanuka Beach Resort, Coffs Harbour from Friday evening 20th to Sunday the 22nd of November. The aim is to provide information on the storage, preparation and selling of avocados, bananas, stonefruit and blueberries.



The Queensland fruit fly (Qfly) has been eradicated from Western Australia following one of the most comprehensive programs ever undertaken in the state.

Agricultural Minister Ernie Bridge said eradication of the pest on the scale of the Qfly project was a unique achievement in Australian agriculture, and reflected the Government's strong commitment to local horticulture.

"If Qfly had become established in WA, not only would there have been a significant increase in the amount of pesticide used on horticulture crops, but the future of many innovative projects would have been threatened," he said.

Traps, Baits

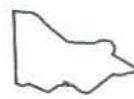
The eradication program started in August 1989, following discovery of Qfly in tomatoes in suburban Dalkeith. It involved a three-pronged attack using lure traps, baits and the release of millions of sterile fruit flies. It was one of the largest in the world to be successfully completed.

Mr. Bridge said new techniques had to be developed for mass rearing, and a quarantine building to rear the 30 million sterile Qfly required weekly had "to be built from scratch."

In addition to laying 2000 traps in a grid pattern, there was weekly baiting of fruit trees in more than 100,000 households over a 300 square kilometre area in the Perth metropolitan region.

Completion of the Qfly campaign also points the way to the possible future eradication of the Mediterranean fruit fly.

(By Ted Wilson, Market Place News, September 1992)



Royal Melbourne Show 1992

The Sunraysia Avocado Growers' Association Inc. (S.A.G.A. inc.), promoted the World's most nutritious fruit at the 1992 Royal Melbourne Show (R.M.S.). This promotion took place over the ten days of the R.M.S. and operated from the Department of Food and Agriculture's stand where a whole range of fresh product organisations demonstrated their products.

Free samples of avocado were offered to show goers. A total of 510 kg or 85 trays of avocado fruit were given away in this manner. The avocado was offered in the form of; avocado dip served with C.C. corn chips, diced avocado, and 2,500 Avocado Salad samples.

The public response to this promotion was excellent. People were very eager to sample the avocado and frequently asked to purchase fruit.

To compliment this promotion, avocados were available for sale from the nearby Victorian Agricultural Societies Association stand that sold 54 trays or 1,350 avocados.

In comparison to the previous six years of promoting avocados at the R.M.S. this was a very modest but highly successful promotion. The cost incurred by the S.A.G.A. inc. was \$3,300 compared to \$12,000 (after revenue) for the 1991 R.M.S. promotion.

Now that the S.A.G.A. inc. is unable to obtain promotional funds from the National levy, the future of the R.M.S. promotion is in question. The avocado stand has become a well known and sort after feature by the public each year, as well as by the Royal Agricultural Society itself.

Mildura Show 1992

Mildura, located in the centre of the Sunraysia district, is a popular holiday destination attracting most of its tourists at Easter time and Spring through Summer holiday period.

The Mildura Show is held in October of each year and is a ideal venue to promote avocados. Being toward the end of the Sunraysia Fuerte season, this fruit was emphasised by the Sunraysia avocado growers who again gave their time in the interest of the industry.

The stand was manned voluntarily by the avocado growers themselves and they offer diced avocados and avocado dip for tasting. Free recipe leaflets were also given away. This year, Natures Cuisine Salad Dressings were promoted as a suitable complimentary dressing for avocados.

To satisfy consumer demand and offset costs of the promotion, products offered for sale included; ripe avocados, half avocados with dressing, The Complete Avocado Cookbook and various Salad Dressings. By operating in this fashion, we are able to promote avocados at our local show for virtually no cost.

Dr Bob Bergh - Visit to Sunraysia

Sunraysia and South Australian avocado growers were treated to a one day visit to Mildura by Dr Bergh and his wife. On Thursday the 8th October, a field day was held with packing shed inspection and walks through avocado orchards. Dr Bergh was surprised to see that the Sunraysia area was very similar to the California avocado growing areas.

Following the field inspection, a magnificent BBQ lunch incorporating local horticultural products was held at the Dareton Agricultural Department. Dr Bergh then addressed the gathering and spoke most informatively on matters pertaining to the local industry, with the three main topics of interest being orchard thinning, propagation, and the Gwen avocado.

AUSTRALIAN ROUND-UP



For the ninth time, the Royal Adelaide Show was a roaring success with crowds enjoying delicious avocados—and all the fun of the fair.

The South Australian Avocado Growers Association's Stand in one of the Horticultural Pavilions (pictured below) dispensed endless samples of avocado dips (guacamole and curry) and avocado pieces. Sales of half avocado "Boats" (the centre filled with dip and decorated with C.C. corn chip sails) exceeded 7000. It was pleasing to see more teen-agers buying these.

Our numbers, wives, friends and H.L. Banana's promotional staff made more than one tonne of dips and still found time to advise the public on the virtues of avocados.

This year the fruit (NSW and QLD Hass was used) was extremely good, but we still received some trays of unsuitable fruit. This fruit, most of which would have been sold on the market to unsuspecting customers through retail stores, is seen as one of the greatest problems in our industry—the quality of the fruit at the retail level. Conversely, the issue of cholesterol is dead.

Quality Assurance Challenge

Next September we offer producers of Hass avocados an opportunity to check their QA program by sending their product to the Adelaide Show.

It will be cut, inspected and either sold as avocado halves or made into dips or pieces for tasting (total quantity will be limited to two tonnes). Those growers who take up this offer will receive a QA report on the quality of their fruit.

Fruit will be paid for at ruling market prices if consigned to the Adelaide Market through H.L. Banana Pty Ltd. More detail will be given in future issues of this magazine.



Avocado "Boats" on "sail" at the Adelaide Show.



Atherton Tablelands

The grower group known as Shepard Australia was launched on the Atherton Tableland last August and has become an active sub-committee of the Atherton Tableland Avocado Growers Association (ATAGA).

Shepard growers had been long considering the need to become more organised in the marketing as well as the growing of their 'variety', which, they believed, would become increasingly prominent on the early market. They responded decisively to the Federation's Strategic planning statement that the industry form into 20 marketing groups by starting a marketing group in the most northerly growing region.

There are 50 or so known Shepard growers and we expect most of these will be members of Shepard Australia by the beginning of the coming season. Some members are from Bundaberg as well as the Tableland region.

With flowering just completed, the management committee consisting of Jim Kochi, Mary Ravanello and Dell Lavers with considerable help from Irene Kernot and Terry Campbell of the DPI, is preparing a crop forecast for the coming February-March supply period. A Field day and group meetings have been held on monitoring and orchard spray procedures. As the picking season approaches, a training course for shed graders will be held to ensure quality is uniform and accurate. Fruit outturns will keep the importance of quality squarely in front of growers and packers.

One wholesaler, InterHarvest of Brisbane, has been selected to conduct a marketing and promotion exercise on a portion of the Shepard crop. All fruit will be ripened and a big effort will be made to draw attention to

the high consumer appeal of the Shepard in the early part of the season. Also there will be other promotions to help other agents at all main markets in their sales.

The enthusiasm of growers in launching Shepard Australia has been most rewarding. We are particularly grateful to the help given by DPI staff and by Richard Bennett of Australian Horticultural Corporation (AHC), whose visit during the AHC roadshow coincided with Shepard Australia's inaugural field day.

Tablelands Visit by Bob and Gwen Bergh

Avocado breeder of renown, Bob Bergh and his delightful wife Gwen made the Tablelands their first stop-over in Australia on their tour of growing areas before and after Conference '92.

While they shrugged off their jet lag, we showed them some larger crocodiles in the

Daintree river and the assortment of pelicans, ducks, kitehawks, eels and platypus that greet tourists on Lake Barrine.

At the luncheon held in their honour, Bob gave a brilliant talk on his life's work in breeding physiology and pollination of avocados. He also commented on the nutritional qualities of the avocado fruit, observations that will be useful in industry promotion.

It was interesting to learn that Bob's plans for a restful retirement include writing one book on the global Avocado Industry and another on Human genetics, a field in which he is also renowned.

We wish Gwen and Bob well in their retirement and hope they have time to revisit their many friends in Australia.

Field Day Notes

About 40 growers attended a field day that ATAGA and Shepard Australia recently held at Nat and Mary Ravanello's orchard near Mareeba.

The program for the day included a mulching demonstration and talks by Richard Bennett and Rob Gray from InterHarvest. During the afternoon Bruno Pinse showed growers a demonstration of sprayer calibration.

Mulching avocados is of enormous importance, particularly in the light sandy soils around the Mareeba area. The organic matter content in many of these soils is extremely low, certainly lower than the levels of 5-10% that have been stated as desirable.

The Ravanello's have developed a system using square bales that speeds up the spreading of hay considerably. Bales are untied and put out along the rows. A slasher is used to pulverise the bales. The hay is then easily raked into the rows. This produces a really good thick layer of mulch in much less than a quarter of the time the process would take by hand.

Richard Bennett gave an interesting talk about the plans that the AHC has for generic promotion of avocados and summarised marketing research on consumer likes and dislikes. The survey showed that many people preferred smaller avocados.

Rob Grey from InterHarvest spoke about the strategies that InterHarvest has for marketing and promotion of Shepard. This was of particular interest to the growers. InterHarvest believes that not only do we need to introduce avocado to the many people who have not even tried the fruit, but also we need to encourage consumers to eat them more often. Promotion is not just to sell the fruit you have but to create demand for more of it! Growers are looking forward to seeing the results of the joint marketing and promotion they will be doing this season.

Quality fruit is the key to consumer acceptance. One key to good quality fruit is a good spray program. Bruno Pinse reminded growers that spraying is a waste of time and money if the sprayer is not doing the job. As trees grow they require bigger volumes of spray for the same effect. Therefore sprayers must be calibrated regularly.

The day was an enjoyable one and growers are looking forward to having these days more often as the coming season approaches.

Cercospora Spot Of Avocado

R.A. Peterson & K.R.E. Grice, Plant Protection Mareeba, Conference '92

Introduction

The avocado fungal disease, Cercospora Spot, was recorded in Australia for the first time in April 1992 on the Atherton Tableland. This disease has been in Florida since 1920 and was recorded in South Africa in 1974. It is also known to be present in the Caribbean, Cameroon, Brazil, Mexico and the Ivory Coast of Africa.

On the Atherton Tablelands, the disease has been found on eight properties in the Atherton and Eachum Shires. It is also present on a tree growing on the footpath in Malanda. Cercospora Spot has not been found on trees in the neighbouring shires of Mareeba, Herberton, or Johnstone on the coast. It also has not been found in other avocado areas of Queensland.

The origin of the organism in Australia is unknown. Some growers claim to have seen symptoms similar to Cercospora Spot for the last 3 years, but attributed the damage to insect attack, rub damage or anthracnose. It is possible the disease has been present for many years, but has gone undetected.

Symptoms

Cercospora Spot occurs on fruit, fruit stalks and leaves, although it is not found on young immature tissue or flowers. The fungus produces small brown to dark brown angular spots on the leaves. They first appear on the under surface of the leaves as slightly raised blister-like swellings, purplish in colour and not visible from the upper surface.

As the lesions mature, the affected areas turn brown, the tissue collapses and the spot has a sunken appearance visible on both surfaces of the leaf. Spore bearing tufts of fungal tissue emerge from both surfaces, forming a greyish tinge over the surface particularly on the under surface. Spots may be scattered over the leaf, but frequently, several spots are grouped together, forming irregular brown patches of necrotic tissue.

In the initial stage on the fruit the green epidermis becomes slightly darker at the site of infection. A swelling of the underlying tissues causes the surface of the spot to become raised shiny and dark brown to black in colour. As the epidermal cells die and the tissue dries out, the spots become sunken and lighter in colour with horizontal cracks. The spots may increase to 10-12 mm in size and finally develop into circular areas of brown hard tissue.

Fruit spots, as with leaf spots, may be scattered over the surface, but frequently occur in groups and may coalesce forming irregular areas of dead tissue deeply fissured by surface cracks. The fungus is confined to the outer surface of the rind tissue and it does not invade the lower tissue of the fruit. However, other fungi that cause fruit decay can enter through the cracks.

Cercospora Spot also occurs on the fruit stalks where the symptoms are similar to those on the fruit but frequently precedes the fruit spots by several weeks. This phase of the disease can be particularly severe on stems of some cultivars such as Fuerte. These spots weaken the stem and as the fruit increases in size, it is more prone to fall, especially during periods of high winds in late summer.

The photographs on the front cover show the symptoms of Cercospora Spot on leaves as well as fruit. The symptoms on fruit are similar to severe anthracnose but the lesions tend to be raised and cankerous instead of sunken. On the leaves the symptoms are quite distinctive.

The Pathogen

Cercospora Spot is caused by the fungus *Pseudocercospora purpurea* (Che) Deighton (syn) *Cercospora purpurea* (Che). An ascomycete, resembling a species of *Mycosphaerella* has been found in the larger dead spots on old matured leaves, but the relationship to *P. purpurea* has not been confirmed.

Importance of Disease

Cercospora Spot was a major disease problem in Florida during the 1920 and 1930s, causing a down grading of fruit rendering most fruit unsuitable for sale. However, the importance of the disease has diminished greatly due to the use of very effective fungicide spray programs.

In 1974, it was reported from South Africa, the unsprayed orchards produced only 20% exportable fruit, while 85-90% of fruit from sprayed orchards were suitable for export. Surveys in 1987 from the

same area showed that losses of up to 69% were common where sprays were not used, while losses were only 7-12% in orchards receiving 2-3 sprays of copper.

In northern Queensland, the disease has only been found in unsprayed trees or at the top of very large trees. It has not been found in orchards employing effective spray programs that ensure coverage of all parts of the trees. Also, Cercospora Spot has only been found in the wetter areas of the Tablelands and has not been found in the drier areas near Mareeba.

Cultivar Reaction

In South Africa, Cercospora Spot has been found on all cultivars, although Fuerte and Bran are considerably more susceptible to the disease than Edranol and Hass. In north Queensland, the disease has been found on Fuerte and Sharwil. It has not been observed on Hass, Edranol or Wurtz fruit, although a few lesions have been found on leaves of the Hass cultivar.

The reaction of other cultivars in north Queensland such as Shepherd, Rincon and Hazzard is unknown.

Biology of the Pathogen

Diseased leaves are the principle means for season to season survival of the organism and fruit infections originate from inoculum primarily produced on diseased leaves. *P. purpurea* has only been recorded on *Persea americana*, but it is likely it may occur on other plants in the Lauraceae family.

Spores are produced abundantly during periods of warm, wet conditions and spores are distributed over long distances by wind and insects and through the trees in drops of rain and dew.

During the period in between, infections readily occur when spores are present and conditions are favourable.

The critical period for fruit infection is most likely when the fruit are 25% to 75% mature. The exact limits of susceptibility for avocado fruit are not known in relation to time of the year or size of the fruit. In Queensland, this period of susceptibility would be about November to March, which includes much of our wet season.

Studies in Florida show that young avocado fruit and those that are nearly mature are practically immune to infection by the fungus.

Field inoculations in north Queensland in May were not successful suggesting that

under local conditions, mature fruit are also not susceptible to infection.

In Florida it takes 30-40 days for symptoms to develop and another 10-15 days for spots to become fully formed.

Invitro studies at Mareeba show the fungus is favoured by higher temperatures. Spores germinated (74%+) over a wide temperature range (18.5 to 31°C) but both germ tube growth and vegetative growth are more restricted by temperature (55% of maximum occurs at 23-28.5°C for germ tube growth and 20-28.5°C for vegetative growth).

Cercospora spot requires moist conditions for establishment. It is common in the wetter areas such as Florida, Brazil, Caribbean, Ivory Coast and parts of South Africa, but it is not important in the dry areas such as California. A moisture level of 98-100% is optimum for spore germination although some germination can occur at levels as low as 80% relative humidity.

Germ tube growth is also sensitive to moisture as at a relative humidity of 95%

it is only 20% compared to growth at 98-100%. The Cercospora group is generally very tolerant of periods of dry after germination has commenced. The fungus becomes dormant during the dry period and remains inactive until sufficient moisture is available when growth resumes.

Control

Damage from Cercospora Spot can be reduced by growing the more tolerant cultivars in the wetter areas and only growing the susceptible cultivars in the drier areas.

Studies in both Florida and South Africa show that Cercospora Spot is easy to control with fungicides. Copper was shown to be effective in trials conducted during the 1900s in Florida and more recently in South Africa. Other fungicides that are also effective include benomyl and captan.

As young avocado fruit are highly resistant to Cercospora spot, spraying is not required until 2-3 months after flowering. In Florida, the majority of infection occurs in May and June, as sprays in early May

and 4 weeks later give 80-90% of the control achieved by the addition of extra sprays.

In Florida, 3 sprays are recommended, applied in May, June, July (approximately 10, 14 and 18 weeks after fruit set). In South Africa applications in November, January and March give excellent control of Cercospora spot. In the Cameroons and the Ivory Coast where conditions are very wet, sprays are recommended at 10-15 day intervals.

Observations in north Queensland support the reports on the effectiveness of copper fungicides for control of Cercospora spot. The disease has only been found in unsprayed areas and in the upper reaches of large trees where coverage is inadequate.

The disease has not been found in orchards where spray coverage is achieved throughout the trees, even in those orchards in close proximity to orchards where the disease is present.

QDPI Wall Chart To Protect Avocados

"Protect Your Avocados" is the theme of a colour wall chart detailing pre- and post-harvest avocado pest management prepared by the Queensland Department of Primary Industries (QDPI).

Ideal for the office or packing shed, the 100 cm x 70 cm chart was produced at the Maroochy Horticulture Research Station at Nambour and involved staff from the QDPI's Entomology, Pathology and Horticulture Branches.

QDPI principal horticulturist, Roger Broadley, said the chart was part of an ongoing package of protection measures which represented a strategic approach to avocado quality.

The package also includes a book entitled "Avocado Pests and Diseases" and a video entitled "Management of Phytophthora Root Rot in Avocado Orchards".

The chart has four main sections:

- Recommendations for pest and disease control, pre- and post-harvest.
- A comparison of fruit damage by fruit spotting bugs and fruit flies.
- A table on chemical spray rates needed for different tree canopy sizes.
- Safety cartoons.

The recommendations section includes the trade name, application rates, timing and remarks about the different chemicals needed to combat more than 20 listed pests

and diseases affecting the different stages of avocado growth comprising flowering, fruit set to maturity and post harvest, plus photographs of tree decline caused by Phytophthora root rot.

Chemical spray rates of selected fungicides and insecticides are also listed in a table which provides the volumes needed for different tree canopy sizes using high volume and low volume sprays.

With farmers often confused about damage caused by fruit spotting bugs and the Queensland fruit fly which often results in the wrong spray being used, the chart lists the differences in causes of damage, cultivars affected, part of the fruit affected, skin and flesh symptoms, depth of damage and any further developments. These are also supported with colour photographs.

Safety aspects are also stressed with a series of cartoons about handling chemicals and the wearing of safety equipment.

Costing \$15 including the packing tube and postage, the chart is only available through the Maroochy Horticulture Research Centre, PO Box 5083, Sunshine Coast Mail Centre, Nambour, 4560, telephone (074) 41 2235 or (074) 44 9600, fax (074) 41 2235.

Avocado Trees Toxic to Animals

Recent findings suggest avocado trees contain a toxin which can be poisonous to animals affecting the heart and probably cause the severely swollen head and breathing problems seen in horses. In other countries avocado plants had been known to poison cattle, goats, rabbits, birds and fish.

Queensland Department of Primary Industries veterinary pathologist, Dr Ross McKenzie, of the Animal Research Institute in Brisbane, said avocado poisoning of horses was unusual but a number of cases had been recorded in south-eastern Queensland.

In one case a few years ago at Coomera (Gold Coast hinterland), 13 horses in a herd of 16 developed tender swellings of the head and throat. Nine of these horses were very badly affected after grazing in an abandoned avocado orchard.

The trees were three to five-year-old Hass variety, and new leaves were growing after recent rain. Over the next two days the horses were seen eating fresh leaf shoots and some of the fruit.

The worst affected horse, a mare, had a severely swollen head, swelling and closure of the eyelids, and had difficulty breathing. All of the affected horses were treated immediately and recovered over the next few days.

Avocado Industry Participation In The Australian Horticultural Corporation

By John Baker, Managing Director, Australian Horticultural Corporation, Conference '92

The avocado industry, represented by the Australian Avocado Growers' Federation, has agreed to participation in the Australian Horticultural Corporation (AHC) with participation to be reviewed at the end of two years. The industry has agreed to a marketing levy of equivalent to 15 cents per tray, collected by DPIE Levies Management Unit and managed on behalf of the industry by the AHC.

Benefits of industry membership of the AHC include:

- Access to resources to implement national and international market support programs.
- Funding for programs based on an equitable national levy, and
- Cost effective implementation of programs through sharing of resources with other AHC participating industries.

Programs being implemented by the AHC are based on industry priorities developed at an industry strategic planning workshop held in October 1991. Key growers, wholesalers and retailers were involved in the development of the strategic plan.

Programs and objectives include:

- **Domestic promotion** Implement a cost effective promotion plan by maintaining the industry product profile with the trade and consumers in 1992 and develop a national promotion strategy (incorporating advertising, promotions and public relations) for 1993, based on market research.
- **Market research** Implement a production and marketing data base, complete domestic market research studies and define export market research requirements.
- **Industry data** Gather avocado industry data relating to production, plantings and growers to provide a reliable and accessible source of industry statistics.
- **Quality** Encourage industry to use Quality Assurance (QA), covering orchard management, packaging, distribution through to wholesaler and retail levels, with mandatory national QA for export.
- **Product handling** Establish a product handling accreditation scheme for wholesalers and an education program for retailers.

Pictured at the signing (from left): AHC Managing Director John Baker, Chairman Malcolm Irving, with AAGF Executive Officer Ross Boyle, and President Robert Mosse.



- **Packaging and labelling** Design an export brand, tied to quality product, in order to establish the basis for developing "quality" brand acceptance in international markets.

Domestic Promotion

At the request of industry, Queensland Fruit and Vegetable Growers have been contracted to undertake a national magazine based advertising campaign, together with in-store demonstrations and public relations campaigns in Brisbane, Sydney and Melbourne. State avocado associations have been contracted to implement in-store campaigns in Adelaide and Perth.

The AHC has also undertaken a food media promotion involving both the avocado and macadamia industries in mid August. The program involved a visit by Australia's key food writers to Sunshine Coast farms and packhouse operations. Benefits of the visit will include a close relationship between the writers, the industry and the AHC, together with ongoing publicity for avocados.

Other Programs

The AHC already has programs underway in the areas of:

- industry data;
 - quality;
 - product handling;
 - packaging/labelling;
- and it has been agreed that avocado components be included.
- **Communication**

The industry has agreed to:

- Establish a national marketing forum, which will enable growers, wholesalers and retailers to contribute more directly to marketing and promotional campaigns.
- Undertake joint AAGF/AHC presentations in major avocado producing areas. The AHC has set a target of visiting all major production areas at least once a year.
- Review the production and distribution of the industry newsletter.

AAGF Funding

The AAGF has agreed to utilise funding from avocado levies to support the operations of the Federation in its consultation with the AHC.

Government and AHC guidelines mean that up to \$40,000 (10% of net levies) will be available to the Federation in 1992-93, providing relief to regional and state organisations in their funding of AAGF.

Basis of Participation

The relationship between the avocado industry and the AHC is one of co-operation to further the industry.

Key features are that the AHC implements programs based on industry priorities and the Corporation's performance is measured against the outcomes of those programs. The partnership between the industry and the AHC has been documented in a Memorandum of Understanding, signed by the Australian Avocado Growers Federation and the Corporation.

AHC Hits The Road

Communication was the star at the first avocado roadshows held in Western Australia during July, Sunraysia and the Atherton Tablelands in August and Coffs Harbour, Bundaberg and Sunshine Coast in September.

The Roadshow gave growers the opportunity to hear about the programs being undertaken by the AHC and talk to the Corporation's Industry Development Officer, Richard Bennett, about key issues. Programs outlined to the growers covered domestic promotion, quality, market research, industry data, marketing forums, levies and retail training.

Growers were particularly interested to see industry data from the Horticultural Research and Development Corporation's consumer study of the fruit and vegetable market undertaken in 1990 (see page 17) which outlined consumption behaviour, buyer concerns and desired features of avocados.

Participants also were interested to hear about the establishment of the avocado marketing forums which enable the industry to deal with the specifics of marketing such as the origins of the product, new varieties and niche marketing opportunities. Some participants expressed concern over the slogans used in the advertising and others highlighted the need to effectively launch new varieties. The marketing forums will enable such issues to be raised, discussed and acted upon.

Levies Working Party

A working party involving representatives from participating industries is being formed by the AHC to examine levy collection, compliance, communications between the Levies Management Unit (LMU) and industry, and alternative collection methods. A report on levy collection options was due from the DPIE at time of going to press, and will form the basis for the first working party meeting.

With regard to the Avocado industry, a review of levy collection at Sydney and Melbourne markets was undertaken by the AHC Management. Details were provided to LMU and AAGF on any discrepancies found as a result of the review.

The AHC has also gained agreement from retailing chains Coles and Woolworths to supply names of their direct suppliers to LMU, the body responsible for collection and distribution of levies.

AHC Staff Profile

The AHC currently has 15 staff to service activities for its nine member industries. In addition to avocados, the participating industries are apples and pears, citrus, nashi, nursery, chestnuts, dried fruits (through the Australian Dried Fruits Board), macadamias and honey (from January 1993).

One of the new recruits is Lilac Ong, appointed as Strategic Marketing Manager in June this year. Lilac is primarily responsible for assisting in the development and implementation of strategies to increase market opportunities in Australia and overseas for member industries of the AHC. Her position also includes supporting the establishment of quality standards, steering marketing and communications programs and promoting Australia's horticultural products to the overseas markets.

Lilac brings with her skills and knowledge gained from a broad range of industries and work experience with very diverse marketing environments including advertising, telecommunications and US-Far East Trade. She has an M.B.A. from Syracuse University, Syracuse, New York, majoring in Innovation Marketing and International Business.

Her last position was a Multimedia Market Development Manager for IBM Asia-Pacific where she was responsible for developing and introducing new products and technology to the Asia-Pacific region.

Seeing The Opportunities

Market Place News September 1992

The Horticultural Policy Council's (HPC) report on the future of our industry is not a huge, wordy, document, but it is a very potent one. It is a compilation from the views of 143 written submissions from around Australia, plus the results of face to face "Focus Group" meetings and backed by the best statistics than can be found.

The picture may seem a rosy one in the light of current economic circumstances, but there are some important provisos in the forecasts. Not the least of these is that there must be acceptance of change at both government and industry levels to ensure the industry becomes world competitive, and to ensure growth on both domestic and export markets.

A clear message from the discussion groups was that meeting the requirements of the market means that each industry

Industry Commission Inquiry

The Industry Commission released in September, a report on its inquiry into the effectiveness of the AHC in increasing Australia's international competitiveness. The Commission confirmed the AHC's potential in this area and recommended as an interim measure, further funding to July 1994.

The Industry Commission said that many of the activities in which the AHC is engaged have the potential to be beneficial to Australian horticulture and are consistent with improving its international competitiveness. In particular, its activities in strategic planning, quality assurance certification, export promotion, market research, encouraging communication amongst participants, and negotiating freight rates have this potential.

Malcolm Irving, Chairman of the Australian Horticultural Corporation, said the AHC is confident of the contribution it is making in overcoming structural impediments in the horticultural industry and facilitating development of exports.

The industry's peak body, the Horticultural Policy Council, has established that horticultural exports could increase five fold within ten years. However a catalyst such as the AHC is needed to achieve that potential. The AHC anticipates that if significant rises in horticultural exports eventuate there will be subsequent increases in regional and youth employment.

"There have already been significant achievements in areas such as market access, promotion, quality and strategic planning. However the AHC and the horticultural industry must continue to build a unified national horticultural industry which is internationally competitive," said Mr Irving.

sector should concentrate on doing what it does best. That is, growers grow, merchants/exporters market, and processors process.

The impetus for change will come from vertical integration, or co-operative arrangements among large scale enterprises and growers, but with family farms remaining an important element.

Much integration has already occurred and more will occur, as the export oriented culture grows.

However, co-operation is the key. It means pulling one's head out of the sand so you can see the opportunities.

Quality Doesn't Cost, It Pays!

Quality Assurance and Total Quality Management are quickly becoming the "buzz" words of Australian industry for the 1990s, and rightly so if this nation is to increase its export levels and remain a viable producer for the domestic market.

The ability to produce goods which can compete successfully with those produced by other nations relies on improving both our attitudes to quality and the management practices of Australian industries to raise production, quality and quantity.

Lyall Howard, Quality Manager for the Australian Horticultural Corporation (AHC) and responsible for managing the Australian Horticulture Quality Certification Scheme said, "Quality is putting customer satisfaction first and meeting customers' needs."

"Consumers are not the only customers. There are customers and suppliers at every stage of production and marketing and if the customer's perception of what was received falls short of their expectations, they will not be satisfied. This results in complaints, delays, wasted effort, loss of goodwill, the costs of rectification or replacement with dissatisfied customers often seeking other sources of supply," said Mr Howard.

How can quality be achieved? It is a managed process that involves the commitment and participation of all employees. No-one can buy quality simply by investing in new technology. It will contribute to quality improvements but the involvement, loyalty and responsibility of people is also necessary.

Approaches To Quality

Mr Howard said, "There are two generally recognised approaches to achieving quality. The first is quality assurance (QA), a stepping stone to the second, longer-term objective of total quality management (TQM). QA gives customers confidence that they will consistently receive the quality they demand, whereas TQM seeks to provide products and services that exceed the expectations of customers."

Quality Assurance is a means of producing an item correctly the first time and every time after that. It includes good management discipline and emphasises the prevention of quality problems, including an automatic corrective action procedure to investigate the causes of any breakdowns in the quality system.

By definition, a Quality Management System is a documented and systematic approach to managing a business. The benefits include increased profitability

through greater efficiency and predictable products output that consistently meets market requirements.

Total Quality Management (TQM) is a management philosophy that involves constant focus on improvements in product quality, customer service and all processes in the business (such as production, storage, handling and distribution) that influence quality. Every part and every person of the organisation is directed towards reducing waste, improving efficiency and controlling variation.

Quality Certification for Horticultural Industries

The Australian Horticulture Quality Certification Scheme (AHQCS), administered by the AHC has been specifically developed for Australia's horticultural industries. Its main objective is to increase the profitability and international competitiveness of Australia's horticultural industries by fostering the adoption of quality management systems, based on recognised product specifications.

Mr Howard said, "Suppliers certificated under the AHQCS will be licensed to display a Quality mark on letterheads, promotional literature, signage and packing materials."

The AHQCS is currently being internationally accredited and those using the quality mark will be internationally recognised as committed to quality through their implementation of the international quality system standard, ISO9002.

The Need for Documentation

It is often perceived in industry that the introduction of a quality system to small companies in particular, requires a vast amount of paperwork.

"Documentation is certainly a requirement of a quality system, but in practice a documented system will often highlight opportunities for reducing costs. Costs and waste can be quantified and records can be used to understand the causes of quality problems," said Mr Howard.

Procedures form the basis of a quality system. They clearly identify to staff how to carry out activities, are used for training and ensure supervisors have a basis on which to influence quality performance.

Benefits

Benefits to businesses developing a quality management system include increases in efficiency and productivity with reductions in waste and costs, which bring significant growth in profit margins. As

No-one can be left in any doubt that control of avocado quality is important. The photograph on the back cover of this issue shows a tray of avocados removed from the Sydney market by a departmental inspector.

If it takes this kind of exposure to make growers realise that we cannot put this type of rubbish on the market, so be it!

The two articles presented in this section of the magazine tackle the problem from different aspect; the theoretical and the practical.

The first is from the AHC and lays the foundation for managing quality; the second is from a paper presented at the Biennial Conference and deals with the nuts and bolts of implementing quality control.

well, as customer confidence grows to high levels, suppliers can lock out their competitors by becoming "preferred suppliers."

However Mr Howard said there are also legal as well as financial and commercial benefits.

"Courts recognise that a quality management system independently certificated to a recognised standard, demonstrates the supplier has exercised due diligence to ensure that only safe and wholesome food is supplied. This is reassuring to those

involved in exporting, particularly those trading with the UK and Europe, where tough new food safety laws have been legislated," said Mr Howard.

Also documentation can help in demonstrating an employer has undertaken health and safety requirements for their employees.

If overseas trends are an example, quality management is here to stay. The old approach of inspection at the end of the process to sort out defects is wasteful of resources and doesn't work. A recognised

quality management system, certificated to a recognised standard by an independent third party, is a powerful marketing tool and demonstrates that suppliers are serious about quality and customer satisfaction.

For more information about the Australian Horticulture Quality Certification Scheme and quality management, contact Lyall Howard, Australian Horticultural Corporation, Level 14, 100 William Street, Sydney 2011, ph. (02) 357 7000, fax (02) 356 3661.

Practical Quality Assurance

Jay and John Dorrian, Dorrian Farms Childers, Conference '92

Introduction

The Quality Assurance system that we have adopted initially was implemented by the Sunshine Coast Fruit Marketing Co-operative for 12 months and then by Zebra Packhouse and ourselves with the aid of a government grant and the co-operation of the Sunshine Coast Fruit Marketing Co-operative. We have also been involved with Australian Mango Exports Limited and their Quality Assurance program for two years. Just recently Coca Cola-Amital has introduced a grower Quality Assurance program for their potato suppliers in which we are also involved.

We would like to stress that Quality Assurance does not guarantee the best product on the market. It guarantees that we are fully aware of the standard of our product. We know exactly what is in every tray of fruit and that the buyer is getting exactly what he's paying for—not more, not less. It allows us to guarantee consistency of quality through our three grades of product.

The Quality Assurance system that we have adopted for avocados has been adjusted to suit our own situation. The system is not as sophisticated as would be used for long term storage crops such as apples or kiwi fruit. However, we believe that the system we use is adequate for our situation with regard to the level of buyer demand for Quality Assurance and the storage characteristics of avocados.

Our experience in dealing with large Australian retailers has shown that a quality assured product does not give you a marketing edge at the present time. However, our exports to a UK market showed that a quality assured product was demanded by the major buyers. Our experience with mangoes last season showed that, when the overseas Asian markets were being flooded with sometimes

inferior quality fruit, Quality Assurance became a secondary consideration to price. We also believe that when dealing with agents in the market system, Quality Assurance is something that most of them have not heard of and are not particularly interested in.

Quality Begins in the Orchard

Fruit quality is determined during the production of the crop with the highest point in quality reached at harvest. After that, quality deteriorates at a rate that is dependent on conditions under which the fruit was grown and its post-harvest handling. To maximise quality, ongoing monitoring of trees and fruit during growth is essential.

We have had all of our permanent staff do an IPM training course that makes them more aware of any disorders they may come across in the trees. With the IPM program they are taught to monitor for insect pests and diseases and our spraying program is based on this information. The field foreman has also been trained so that he can bring to our attention any problems during harvesting of the fruit.

Besides staff vigilance, we have an automatic weather station linked to our office computer. During the mango growing season we are able to monitor for anthracnose by way of a software program that predicts when infection may occur. Weather monitoring is also very important during the production of avocados. We also listen to the daily report on radio produced by the Bundaberg IPM program.

It is very important to keep a diary detailing pesticide applications. Not only is it necessary for export fruit but it is invaluable should problems become apparent during the packhouse Quality Assurance procedures. Pesticide practices may need to be revised. The pesticide diary should include application dates, materials and rates used. It is also beneficial to note why

the spray is being applied, weather conditions and any other information that may be relevant to assist with future management decisions.

Tree health is very important as stress conditions in the orchard not only affect the appearance of fruit but also the internal quality that is expressed during shelf life and consumption. Obviously if an orchard has a high percentage of Phytophthora effected trees no Quality Assurance system will produce export quality fruit. However, it will allow the packing of a consistent grade of fruit accepted by some sectors of the market.

The production of quality fruit depends on effective management of fertilising and irrigation. We have documented guidelines to follow and strive to stay as close as possible to these with the use of yearly leaf and soil analyses and the use of tensiometers.

We also have consultants help us with all aspects of our production from planting to packing. The consultants set the parameters and we try to stay within them. We do not believe we have the time or skills to set all management criteria ourselves (a little knowledge is dangerous). Also we are particular as to whom we engage as consultants as there are many unqualified people posing as experts.

While some orchardists may think they don't have time to spend a few hours a week checking for pests, recording what they've found and keeping a detailed spray diary, we have found that it is possible to decrease pesticide application.

Correct timing of pesticide application rather than a blanket routine spray program, leads to more efficient spraying through reduced chemical and labour costs. This also has the added benefit of less pesticide residue in this age of increased chemical awareness. An excellent example is that in the last two years, we

have been able to reduce our potato spray program from a weekly spray to the present situation where insecticides are not used at all. We would see this as the ultimate aim for our avocado production and we have made some progress in that direction.

Orchard hygiene is often overlooked but simple measures can only result in benefits to the orchardist. We have a foot-bath containing a copper oxychloride solution for staff to sterilise their shoes. This lessens the possibility of pickers transporting diseases from other orchards where they may have been working, for instance, Phytophthora root rot that may be very easily spread by something as simple as muddy boots. We also have a parking lot at the entrance to the orchard and unauthorised vehicles are not permitted access. This system is not 100% foolproof but it does minimise the risk.

Close to harvest time fruit is maturity tested by establishing dry-matter levels. As there are no longer maturity tests performed at markets we do our own to ensure fruit is mature before harvesting. In addition to dry-matter tests a selection of fruit is picked and left to ripen under room conditions. The sample of fruit for maturity testing must be indicative of the fruit that will be harvested.

Also before the packhouse starts we have consultants train our staff. During the last two years our staff have been trained and retrained three times. This avocado season we did not deem it necessary to have another training session because we felt that it wasn't justifiable. We now feel that while the key jobs are being done by fully trained people it is unnecessary for continual re-training of picking and packing staff.

At harvest time fruit is picked in such a way as to minimise post-harvest losses due to physical damage. If there is an unacceptable percentage of cuts or bruising on arrival at the packhouse the problem is immediately traceable and rectified. A Quality Assurance program provides the necessary information to find where problems are coming from and because of documentation, where improvements in areas such as insect control, nutrition, protection from winds or any other problems that may exist can be made.

Quality Assurance in the Packhouse

The packhouse manager doesn't do receipt assessments for quality. We find a field assessment is more accurate than a receipt assessment even when doubling the recommended number of fruit for sampling. The packhouse manager takes a percentage of trees from each block and records the size, grading defects and

quantity of fruit per tree. The information is then given to the quality assurance officer.

If we find the fruit isn't up to normal standards a decision to pack only the two lower grades may be made. This facilitates greater utilisation of packhouse resources. If an export order is to be filled we would ensure that the fruit came from blocks on the orchard that were free of scale as well as acceptable in all other aspects. We have found that the information given from this field inspection does correlate to the quality assurance checks done on packed fruit.

When the bins arrive in the packing shed each bin is marked with the date of arrival and which block it came from. The time it went through the grader is recorded so that we can be assured that no fruit is left on the floor for longer than necessary. Fruit is sprayed with prochloraz, and dimethoate when necessary. Records of the chemical in the spray vat are kept, documenting date, time and concentration of chemical.

We have two people grading the fruit according to the grade standards that we have set to suit our buyers. The grading is monitored by the quality controller and a daily reject bin analysis is performed. If problems occur during the day increased monitoring by QC is performed and the decision to repack or not is made.

The fruit is then packed and placed on a conveyor to the quality controller. We use check tickets in each box so that each packer is monitored for quantity and also pack presentation. This system allows close monitoring of packers performance and also allows time to be spent with packers who are experiencing difficulties.

The quality controller checks every tray of fruit for conformity to grading standard and overall presentation. In addition, twice every hour three trays of the packed product in each grade are taken and EVERY fruit checked for grading defects, weight, overall presentation, and fruit that does not meet the grade standards.

Following inspection the fruit is lidded, passed through a gluing machine and a code is automatically stamped on each box. This code can be changed whenever necessary and allows us an audit trail should problems be found at a later date. Fruit is palletised into counts ensuring that the bottom seven rows are column stacked to ensure maximum strength at the bottom of the pallet. When the pallet is finished it is labelled with date picked, date packed, size and count, time it was put on forced air, time it was taken

off and at what temperature it is stored.

Before this fruit is transported two per cent of packed product is checked to ensure that the fruit is sound and has been labelled correctly. The fruit pulp temperature is also noted. Once the pallet has been sold the pallet card, "A" sheets and field assessments are retained and a paper trail is created between these cards and our computerised records. If any problems arise with the fruit it can then be traced through all the intermediate processes back to the trees. This is particularly important when dealing with direct sales and export situations such as during our mango season when we supply Australian Mango Exports Limited.

With a quality assurance program hygiene cannot be ignored. The packing equipment, cold rooms, packhouse and staff must be clean. Chlorine washes are used from time to time, especially when problem fruit are coming into the packhouse. It is also important to move all reject fruit and any fruit that may be caught in machinery away from the packhouse and more preferably, away from the orchard.

Conclusion

We believe Quality Assurance could and should be practised by all growers. There are many different levels of sophistication in Quality Assurance programs, however we believe there is room for a basic program that could be implemented without great expense. Most growers already carry out most of the necessary management procedures but need documentation to keep a record of information for reference when action needs to be taken.

The grower does not need to implement a Quality Assurance program as sophisticated as we have detailed, but a more basic program will be a step in the right direction and hopefully be an incentive to expand in the direction of better quality control.



World News



A Global Overview Of Avocado Production

H. Leonard Francis, Research Co-ordinator, California Avocado Society, Conference '92

Thank you very much for the invitation to participate in your biennial "Avocado Conference, 1992". I had expected to give a talk on California's research program, but was delighted to receive Messrs Bank's and Dyke's request to present a global overview of avocado production. Thank you Tony Whiley for recommending me.

The bulk of my presentation will be centred on statistics gathered by the Food and Agriculture Organisation of the United Nations, information from Dr. George Zentmeyer, and my observations from limited but enlightened travels.

These figures are very revealing. I am certainly aware of Mexico, Australia, South Africa, Israel, Chile and the Dominican Republic, but how about the Congo, Ghana, or several of the South American countries.

There are at least 42 countries growing avocados. These countries accounted for 1,474,000 metric tonnes in 1990. The seventeen major producing countries accounted for 88%, or 1,295,000 metric tonnes. The top four countries, Mexico, USA, Dominican Republic, and Brazil accounted for almost half of the total; 49.4% or 728,000 metric tonnes.

On a sad note, there will be 2,200 tons less for several years. Hurricane Andrew, as you may have heard, destroyed the avocado industry, as well as everything else, in southern Florida in late August of this year. I understand trees were blown out by the roots and in some areas, only three foot stumps remain.

The major variety of Mexico and California is the Hass. Mexico also has a high percentage of native West Indian and Mexican race selections.

According to Dr. Zentmeyer, most of the fruit in the Dominican Republic and Brazil is from West Indian selections or seedlings. This is true of most of the other South American countries, except Chile. Chile is known mostly for Hass and Fuerte.

The Central American countries; Guatemala, Honduras, Costa Rica, El Salvador, produce

World Avocado Production

	1986	1987	1988	1989	1990
<u>Production over 50,000 mt</u>					
Mexico	448	387	335	320	320
USA (Calif & Florida)	167	277	191	125	160
Dominican Rep	133	133	133	133	133
Brazil	130	115	110	113	115
Indonesia	73	57	66	88	72
Israel	68	135	36	20	35
Haiti	62	61	60	58	58
<u>Between 25,000 and 50,000 mt</u>					
Venezuela	43	42	46	49	49
Chile	35	32	28	39	40
El Salvador	35	35	36	37	36
Columbia	34	43	76	81	81
South Africa	33	38	41	34	35
Costa Rica	31	31	22	22	23
Spain	30	33	35	35	28
Cameroon	30	32	33	34	36
Zaire	27	28	28	28	45
Guatemala	25	26	18	30	29
<u>Between 15,000 and 25,000 mt</u>					
Philippines	22	22	22	22	22
Congo	21	21	22	22	23
Ecuador	20	20	16	13	17
Peru	20	17	30	25	25
Madagascar	18	19	19	20	21
<u>Less than 15,000 mt</u>					
Cuba	12	11	8	9	9
Australia	10	10	11	11	n/a
Honduras	7	7	7	7	7
Ghana	5	6	6	6	n/a
Puerto Rico	4	4	5	4	4
Paraguay	4	4	4	4	4
Bolivia	4	5	6	5	5
Jamaica	3	3	3	3	3
Martinique	3	3	3	2	2
Argentina	3	3	3	3	3
Ivory Coast	2	2	2	2	2
Samoa	2	1	1	1	2
Panama	2	2	2	2	2
Grenada	2	2	2	2	2
Cyprus	1	1	1	1	1
Cook Islands	1	1	1	1	1
Cent AFR Rep	1	1	2	3	3
New Zealand	1	1	1	1	2
Saint Lucia	-	1	1	1	1
Greece	-	1	1	-	1

mostly Guatemalan type fruit from mainly the native criollo trees.

West Indian selections and seedlings predominate in most of the rest of the countries. The exceptions being Israel,

South Africa, New Zealand, Spain and of course Australia. Fuerte and Hass varieties are the major avocados in these countries. Argentina has local selections but also Fuerte and Hass.

Food Media Visits Avocados At Home

The media plays a powerful role in raising awareness of food, providing recipe and usage ideas to consumers and communicating health and nutritional benefits.

As a result, 20 key food writers from Sydney, Melbourne and Brisbane were flown to Maroochydore in August on a joint macadamia and avocado field trip to South East Queensland.

The field trip was devised by the AHC for the Avocado industry with key objectives being to:

- heighten awareness of Australian avocados;
- stimulate consumer interest and support for avocados;
- promote the nutritious content of avocados;
- create a more informed and knowledgeable consumer;
- focus primarily on usage ideas and seasonality;
- focus on taste, nutrition, dietary and health information; and
- communicate to consumers an understanding of why avocados are an important food in the fight against heart disease as a cholesterol lowering food.

The focus of the trip was a guided tour of two avocado orchards (Batson Avocado Orchard and Nursery at Woombye and

Hoskin Avocado Orchard at Palmwoods) with emphasis on growing techniques (including nursery and grafting), disease control, harvest procedures, varietal differences, as well as a tour of an avocado packing shed.

A lunch featuring avocados was provided at Hoskin's property and later followed by a special dinner, again showcasing avocados, with a short presentation from Dr David Colquhoun on his recent research into the health benefits of avocados.

A media information kit was provided to those who attended the trip as well as a further 250 writers nationally. The kit contained a consumer release, usage and storage ideas, seasonality and history as well as health information, background information, fact sheets, recipe sets, ideas and a seasonality guide.

These public relations activities were supported by a special media release and interviews highlighting recent research into the health of avocados and macadamias undertaken by Dr Colquhoun.

As a result of the media trip and distribution of the media kit and special release, coverage has been achieved in all States throughout Australia including over ten TV and radio interviews featuring Dr Colquhoun. Coverage of the trip is expected to continue well into 1993.

Europe Targeted for Avocados

The Market Access Committee (MAC), set up by the AHC in 1989 to consider market access issues for all horticultural industries, has targeted access to Europe for avocados as a top priority for 1992/93.

The MAC consists of key industry and government representatives and following consultation with industry, it has established new product and market priorities.

Specifically for avocados, a reduction is being sought on the current tariff of 8% in the June-November period to the rate applying to Israel of 1.6%.

John Baker, Managing Director of the AHC said it is important that we plan our approach to market access and ensure Government is aware of the Australian horticultural industry's requirements.

The review of market access priorities was required following recent achievements and changes in markets over the last two years.

Mr Baker said it was satisfying that some priorities have been achieved and new opportunities were opening up for Australian horticulture but there was a real need to keep working at establishing new markets.

"It is essential that Australian horticulture diversify and find new opportunities. By targeting new markets we should be able to increase our export activity. One of the first steps is to gain market access and industries must then be ready to take up these opportunities," he said.

The Unity Is Happening

Market Place News, April 1992

The Australian Fruit and Vegetable Industry has long been accused of being too fragmented—so much so that it has almost become a cliché to describe it that way.

While there is still plenty of evidence to support the accusation, gradually it is becoming less obvious.

As more commodity groups and state associations of traders and others form national councils and industry-wide groupings, the parochial attitudes are reducing.

Nine peak industry bodies have now joined the Australian Horticultural Corporation, using its domestic and export marketing services with funds from statutory levies.

Similarly, support for the Horticultural Research and Development Corporation is well established, and the need for industry-wide strategy planning by the Horticultural Policy Council more evident.

More importantly, the one and only non-government umbrella organisation for our industry—Australian United Fresh Fruit and Vegetable Association (AUF)—is gaining in strength as it gets the runs on the board.

The AUF initiated Fresh Produce Foundation, through its Fresh Produce Watch project, has done much to reduce damaging sales-reducing publicity over chemical residues, and AUF initiatives for promotion will help all.

In this field, AUF has probably its best opportunity ever to prove its worth by being a catalyst for combined private sector and government action to produce a national generic promotion campaign.

The larger and more widely representative an organisation is, the more governments will listen. That's why the AUF Combined Produce Industry Conference in Newcastle next September should prove to be the most useful in AUF history.

Local In-store Promotion

A two day in-store promotion will be run at Mildura's busiest fruit and vegetable store in November. The promotion is timed to coincide with the start of the Hass season. How to use avocados will be demonstrated to the public and free samples and give away recipes will be available. Ripe fruit will be offered for sale in the store.

Open Day - Melbourne Wholesale Market

For the first time, Sunraysia avocado growers are planning to promote avocados in the Melbourne Wholesale Market when they hold their annual Open Day in December. Manned by the growers themselves, the stall will offer tastings and recipe leaflets with ripe avocados being available for purchase by the public. This is an extremely busy day for the Market, being the one day of the year where the public are permitted entry to the Market.

Industry Data from Consumer Study

December 1990, an HRDC consumer behaviour study of the fruit and vegetable market was carried out and the result may interest to readers.

Consumption Behaviour

Answer to the question "how are avocados eaten?", buyers replied:

Whole	80%
Own	69%
Sour dips	62%
Sandwiches	53%
Cooked meals	26%

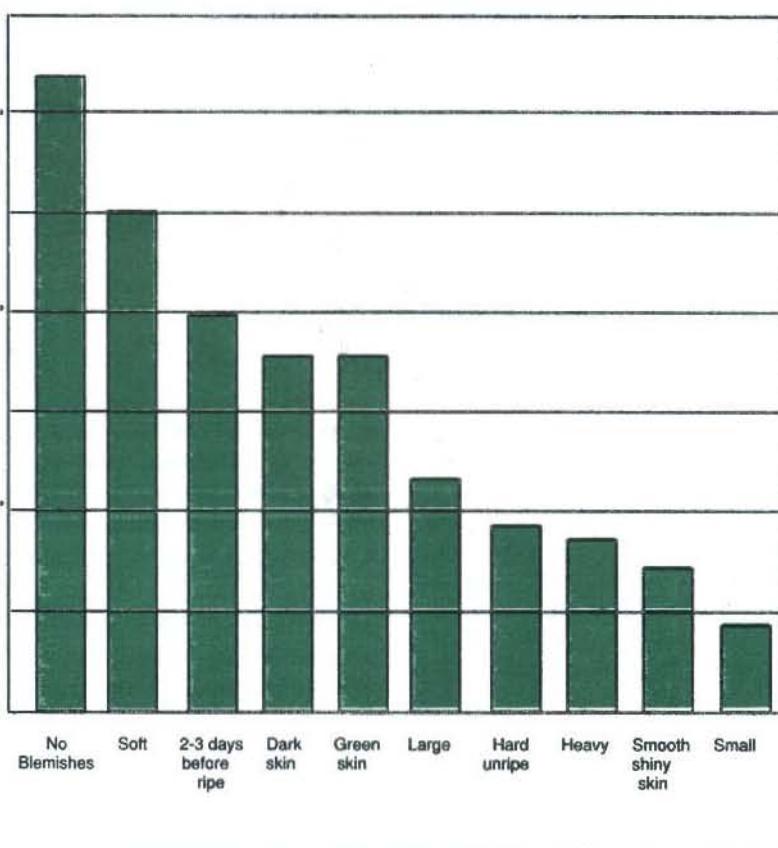
Buyers Concerns

Three per cent of avocado buyers are satisfied with fruit quality. Avocado buyers claim - it is common to purchase avocados that look satisfactory but when served they are not satisfactory.

Desired Features

Consumers want soft ripe avocados with no blemishes or imperfections. The chart shows the full range of features desired by avocado buyers.

DESIRED FEATURES OF AVOCADOS



Promotions Appeal To Taste

At the request of industry, Queensland Fruit and Vegetable Growers (QFVG) have been contracted by the AHC to undertake a national magazine based advertising campaign, together with in-store demonstrations and public relation campaigns in Brisbane, Sydney and Melbourne. In South Australia and Western Australia, State associations have been contracted to undertake promotions in those states.

The QFVG campaign budget is \$150,000 (pro-rated to levy contributions of \$400,000 per year) and utilises "Queensland Sun in Everyone" as the "branding" device. Advertisements are running in two phases - July to October 1992 and April to May 1993 and are designed with "taste appeal" to keep avocados top of mind with readers. Accompanying the advertisement is a cou-

pon for readers to request recipes which has generated significant response to date.

The campaign targets consumer magazines, reaching 80.5% of upper socio-economic groups shown as the major purchasers of Avocados by research. Magazines being used include Women's Weekly, Home and Garden, New Idea, Vogue Entertaining, New Idea, Home Beautiful and Family Circle.

In store demonstrations in NSW, Victoria and Queensland and point of sale material focus on nutrition, storage, handling and recipes. The campaign is supported by publicity organised in each of the states including weekly market reports, features on Gabriel Gate's Channel 9 program, AUF race day demonstrations and product drops and visits to media in radio, TV and newspapers.

Production and Avocados Exports

The Americas

This year American markets have partially balanced out. Due to hurricane Andrew, Florida will only harvest about one-fifth of their normal output. However, a good crop in California sees production increase from 12,300 tonnes last year to 14,300 tonnes this year.

Of this total, 2,700 tonnes will be exported to Japan.

America looks like importing 13,600 tonnes of Chilean avocados although this figure could increase by as much as 30%.

Total Mexican exports of avocados to Europe in 1992 are forecast to be 12,000 tonnes.

Europe

The Spanish crop this year should top 35,000 tonnes with a high percentage of this being exported to other European countries, mainly France, Germany, the UK, and Scandinavia.

South Africa

The South African crop suffered from drought conditions during the year and total exports to Europe look like being no more than 5.5 million cartons of small fruit.

Israel

Total Israeli exports for 1991-92 amounted to 50,200 tonnes, well ahead of the previous season but down on the record crop of 87,000 tonnes in 1986-87.

Research & Development Plan 1991-1996

Introduction

The Avocado Industry's Research & Development Plan, for the period January 1992 - June 1996, is the result of a thorough and comprehensive planning process which was undertaken by the AAGF and HRDC.

The process began with a detailed briefing to all AAGF Committee members, followed a month later by a two-day intensive workshop in August 1991. The purpose of the workshop was to establish the industry's research and development priorities for the next five years, in order that programs can be put in place that will make a constructive contribution to future industry performance.

At the workshop, the AAGF committee reviewed in detail the current programs, concentrating on all major issues. The review resulted in a joint statement entitled "Avocado Industry Research and Development Today".

Next, the committee defined the way in which the industry, and its research programs, will be performing in 5 years' time. Again, a joint statement was prepared, entitled "Avocado Industry Research and Development - A Vision of the Future - June 1996".

Having established agreement on the two principle components of the planning process, in other words 'to know where you are' and 'where you want to go', the Committee then defined the key research and development programs and set the priorities.

Twenty key R&D programs have been established:

1. Pest and disease control (tree and fruit)
2. Quality assurance

3. Rootstock
4. Fertilisers and plant nutrition
5. Retail and wholesale handling
6. Market research
7. Yield productivity/Cultural practices
8. Varietal improvement
9. Technology transfer
10. Total management
11. New and value added products
12. Irrigation and water management
13. Disinfestation
14. Product handling
15. Crop forecasting
16. Orchard floor management
17. Storage
18. Harvesting
19. Transportation
20. Soil quality

For each program the major problem, or problems, have been identified, the circumstances leading to the problem have been detailed and the expected outcome for research and development has been specified. To ensure that Research Organisations receive 'clear direction' on what an R&D program is expected to achieve, the committee laid down a specific statement outlining the objective for individual programs.

On the basis of the current economic environment facing growers and the likely scenario for the future, it is judged that the twenty R&D programs will play a key role in raising performance, productivity and efficiency in all sections of the industry.

Furthermore, it is hoped that the 'vision of the future' will provide R&D organisations with clearer understanding of the industry's long term direction and will result in additional proposals which are likely to increase the rate of progress in all sectors.

In August 1991, a Research and Development Workshop was held to determine the future direction of avocado research.

This article is taken from the proceedings of that workshop and covers the situation in the industry today, where the industry would like to be in five years time and the research areas necessary to achieve that goal.

The full proceedings were published by the Queensland Department of Primary Industries and are available for \$10 from Bryson Dyke, Queensland Fruit & Vegetable Growers, P.O. Box 19, Brisbane Markets QLD 4106.

The Avocado Industry Today

The avocado is a unique food, with proven health attributes, and is one of the world's most nutritious fruits. Grown with a wide seasonal spread in Australia, it has the potential to be available all year round and have a larger per capita consumption than currently exists. A levy for marketing and promotion has just been introduced in South Australia, and the COD marketing program is significant in Brisbane and Sydney. No promotion is co-ordinated on a national level.

The avocado industry is production driven, operating with limited market intelligence. Market research has been

undertaken on the usage and perception of the fruit, but the information has not been widely disseminated, nor acted upon. Market research costs are high.

The product is fragile, the grade standards are unclear and quality is not uniform. The peak production is in winter for a product the consumer considers to be a summer salad vegetable. Overall lack of knowledge by retailers and consumers about the fruit leads to low consumer confidence when purchasing.

The industry has the capability to produce the best avocados in the world: Australia has seasonal advantages and is seen

as a clean environment. There is growing consumer acceptance in Europe and Asia, so the potential for export markets exists. We are hampered by distance, costly and unreliable transport, a lack of suitably controlled containers, and few large-scale packing sheds. There is no national export program or national quality assurance program and frequently unsuitable fruit is bought off the market floor and then exported—affecting our overseas reputation.

The import of New Zealand fruit during the off season provides continuous supply, but quality is inconsistent.

The industry has difficulties forecasting crop production and is not drawing on the existing expertise to put such a system into place. Consequently, the supply and demand pattern for avocados is not well understood throughout the industry.

Farms are mainly owner-managed, and there is a range of management styles. The industry is now using more consultants and there is some new blood bringing expertise from other industries. Computers are not widely used and there's no management software written specifically for the avocado industry.

The yield potential is high, with the maximum for a sustainable yield being 32 tonnes per hectare: yields vary between growing areas. Hass fruit varies in size, and mismanagement of harvesting techniques (such as leaving fruit too long on the tree) keep productivity low. There's little knowledge on the incremental yield increase with age across varieties.

There's no national quality assurance system in place—currently only end-point inspection is undertaken nationally. Three packing sheds in Queensland practise quality assurance (QA), but in WA and SA there are no standards.

Australia has large areas with acceptable soil quality for avocado production. Management systems exist for most soil types and there is a good knowledge of mounding and draining. However, some plantations are on marginal soils, some growers have little understanding of soil preparation, and the effect of soil compaction is not known.

A large gene pool of rootstocks is available in Australia from which to make a selection, but little evaluation has been undertaken on performance or identification of the ideal stock for local conditions. Rootstocks for the industry are based on seedlings. Quarantine costs, evaluation time, a lack of genetic material from overseas and lack of research funds and personnel have restricted rootstock development in Australia.

Similarly, the development of scion varieties has been restricted. More research is needed on Hass and Fuerte, although a significant amount has been undertaken.

Future Editions

The Technical Section in future editions of this magazine will publish articles presented at Conference 92 and the Avocado Research Workshop, and will keep readers informed on future research as well as the results of current research.

There is a comprehensive understanding of old varieties, but the use of good early and late cultivars would ensure year round supply. There is insufficient knowledge of new varieties and their performance.

Cultural practices vary between growers, although an understanding of the crops growth cycle has aided management. New practices which produce improved productivity are not communicated throughout the industry; the reduction of extension officers has meant less information is being disseminated. Canopy management is not widely understood, and there are limited funds for research in this area.

Information is available on offshore breeding programs for varietal improvement. However, there is a dependence on overseas programs for improved genetic material; also these results are not immediately transferred to Australia. The industry has not outlined the ideal tree or fruit, nor has it looked at programs to determine the Asian market.

There is a good knowledge base on orchard design, and disease free planting material is available. However, more understanding is required of spacing, density and canopy management to gain increased financial return from new and existing plantings.

Leaf and soil analyses have been undertaken and the results are available and some research concerning organic fertilisers is in place. The interaction between fertiliser and disease is not understood and little information is available on how fertilisers react in the soil, especially slow release fertilisers. Specific information on fertilisers and plant nutrition especially during the growth cycle, is limited.

Good technology is available for the control of phytophthora in the tree, which is endemic in Australia. There is a lack of information on biological controls and limited integrated pest management systems. Registration of new chemicals is slow and expensive and the government is unwilling to accept overseas data as a basis for registration decisions. There is some resistance to the importation of bio-control organisms. No co-ordinated Integrated Pest Management (IPM) program exists for the avocado industry and many growers lack effective practices to control pest and diseases, e.g. monitoring for insect pests.

Some fruit varieties have some tolerance to pests and disease, but there is generally a dependence on chemicals for control. Also, fruit fly limits export opportunities.

Total orchard floor management needs to be better understood, as currently there is extensive use of herbicides without understanding of the interaction of trees and other vegetation.

A broad knowledge of water management and irrigation exists, and a wide range of equipment is available. This is a costly element of production, the practices vary between growers—poor irrigation practice can exacerbate disease problems and result in neckiness in Fuerte. Water management is more critical during the establishment of the tree, although this fact is not well understood by all growers.

Harvesting time is flexible, most varieties are fairly robust and suitable equipment is available. Labour costs are high, tall trees present problems and some mechanical aids are unsuited to steep slopes. Harvesting is often undertaken to suit a market rather than to provide a quality product through picking at optimum maturity; optimum harvest maturity varies between varieties.

Post harvest treatment for disease control is available, although too often relied upon. Waxes are used, but their effects on fruit quality are unknown. There is no industry-wide post harvest standard for the treatment of fruit.

Reasonable knowledge is available on product handling. The fruit is suitable for mechanical grading and can be handled in bulk. Over-packing, containers too small to stop damage to fruit, collapsing cartons and susceptibility of ripe fruit to bruising are continuing problems.

Avocados can be stored for a reasonable length of time but there needs to be better understanding of the appropriate storage conditions particularly at central markets. There is insufficient information on low temperature storage and disinfection.

Transportation systems are reliable but there is no guaranteed end-to-end transport and the cool chain is often broken. Some specialists have refrigerated trucks, but there are insufficient trucks with air suspension. Controlled air packaging or containers are not available for export.

Some retailers handle avocados well, but poor practices are common, handling knowledge is poor, staff are untrained, and there are no facilities to ripen the fruit in-store. Wholesalers are not market-driven, and the retailer provides little information to the consumer. Generally, the product is over-handled.

Frozen halves have been introduced to the market, but there is no mechanical process for halving and peeling.

With the grower contributing to research and development through the levy, there will be a greater demand for the results. A large volume of information is available but currently it is not easily accessible, nor suitably packaged for growers and processors. An industry newsletter, regional newsletters, departmental books and brochures are the main sources of

information. However, there is no national technology transfer system. The emphasis

is on supply rather than creating a demand for information. There is a big gap between

the technology available and its implementation by growers.

Avocado Industry Vision Of The Future - July 1996

Today in 1996, the Industry is well organised on a national basis and as a result, local and export markets have been expanded and per capita consumption within Australia has increased. Importantly the production sector is unified and is effectively integrated with the processing, distribution, wholesale and retail sectors.

A key factor in the growth of the industry's markets has been the implementation of a national marketing philosophy, backed by a national promotion program and a national quality assurance program. Additionally, growers are capitalising on the new unified organisation by concentrating their activities into 20 marketing groups which are able to supply product throughout the year.

Exports now account for 10% of total production and a co-ordinated export program is in place which involves both QA and export licensing systems. Imports have been reduced significantly through the advent of year round production within Australia.

Market research continues to play an important role in identifying strategies that increase per capita consumption and isolate new market opportunities. As a result the industry is well equipped to satisfy existing consumer demand and create new needs. Furthermore research has contributed to an increasing export business by identifying markets with potential and establishing the differing needs of these markets. Also a data base provides supply and demand patterns to the industry.

Accurate crop forecasting with regular updates is now an accepted mechanism for aiding efficiency in all sectors, as are the market throughput statistics which are produced on a weekly basis.

Increased per capita consumption is the result of higher usage of fresh fruit as well as the introduction of new and value added products. One new product has been launched onto the market each year including baby food, pet food, oil and cosmetic products as well as processed, and minimally processed products. A commercial by-product has been introduced which uses the seed and the skin of the fruit.

Within the growing sector the Total Management Package is now widely accepted as the means to improve productivity and raise bottom line performance. The package is available in accessible forms that capitalise on expert systems technology and include management programs in

finance as well as all aspects of growing, harvesting and distribution of the crop.

Importantly, yield productivity has increased 20% per hectare year on year in existing orchards, economic production systems are in place, and models have been developed to predict cultivar performance by district.

The national QA program is up and running and is well established in a number of key sheds. The program is fully integrated and covers orchard management and packing as well as distribution through the wholesale and retail levels.

The importance of soil quality is now widely acknowledged, growers have a clearer understanding of the best soil types, of the problems associated with soil compaction and the advantages of biological soil conditioning.

Progress in dwarfing rootstock is now well advanced and includes developments in genetic engineering. As a result the new stock is achieving higher productivity and is more disease resistant and salt, cold and lime tolerant.

Improved scion varieties have extended the season at both ends, fewer varieties are now available and have a higher consumer loyalty. Superior examples have been selected from existing clones and have achieved industry acceptance as a result of tree size, productivity, pest and disease resistance and tolerance to adverse conditions. A new Australian variety is being successfully exported with PVR. Additionally, new overseas varieties have been evaluated and strains with smaller seeds have been identified.

Cultural practices are now well understood and fall within the total management package. High density dwarfing systems are in place, canopy management has been improved and chemical usage is at an all time low.

Developments in orchard design now make it possible to determine planting densities to ensure an early financial return. Ideal densities are now included in the Total Management Package.

Fertilisers are now regularly monitored by all growers using improved diagnostic techniques and kits are available for on-farm soil and leaf testing. The interrelationship between fertilisers, irrigation, post harvest, disease, storage and handling is well understood, there is less dependence on chemical fertilisers and the industry is recognised as being environmentally responsible.

Research and development has isolated varieties resistant to pests and diseases. On farm biological control of pests, phytophthora and anthracnose is being achieved and is backed up by district programs. Importantly, uniform national chemical registration is now in place.

Improved orchard floor management continues to impact on farm productivity. The long term effects of weedicides are understood, non-chemical weed control is well developed, cover crops and specialised planting now enhance production and floor management is integrated with IPM.

Effective irrigation and water management principles have now been adopted by a majority of growers. Guidelines indicating water use by variety at the various stages of development are available, including water required at planting and during establishment of the tree. Furthermore, a better understanding of fertigation exists and efficient measuring techniques have been established for monitoring soil and tree moisture.

Harvesting performance has been improved through several initiatives. Maximum and minimum fruit maturity harvesting standards have been established by variety and by area; a uniform testing procedure is in place and a handheld, field maturity tester has been developed. Additionally, a low capital cost mechanical harvester is available, and an optimum bin size is in use.

Post harvest care is now accomplished with minimum dependence on chemicals and a non chemical disinfection technique is in place for local and overseas market access. Biological control agents are now used to control post harvest rots; ripening of all fruit, including early season fruit, is controlled and consumers are able to purchase avocados knowing the best date for eating.

Packaging costs have been reduced to 5% of the wholesale price of the fruit, and effective packaging now protects the product during all stages of handling. A computer assisted quality grading system is in common use.

Effective storage is now maintaining product quality throughout the chain; absolute temperature management control is in place from shed to retailer and long term storage is available for up to 2 months.

Transportation is also contributing to product quality through film technology which maintains modified air for export. Top and bottom ventilation of packaging is

TECHNICAL

used for local long distance road transport. Cost effective transport enables access to all markets, and this includes availability of trucks with optimum suspension systems.

The industry has taken the lead with retailers and wholesalers in establishing the mutual benefits in appropriate product handling. Education programs are ongoing, other fruit and vegetable producers are involved in the exercise; a TAFE certificate course is up and running for specialist fresh produce handlers and an accreditation scheme is part of the QA process is in place for wholesalers and retailers.

Technology transfer now plays a key role in raising industry performance and incorporates both dissemination of information and the development of skills. A data base facilitates access to existing information and technology, all of which is appropriately packaged and user friendly. This includes a CD ROM version of the Total Management Package. All forms of communication are used to 'increase the demand' for information, local technology transfer groups are co-ordinated at a national level but function at a district level, and the technical support infrastructure is well established to ensure the industry achieves its vision.

In summary, the research and development programs which have been initiated over the last few years have made a major contribution to improving efficiency, productivity and overall industry performance and have played an important role in expanding local and overseas markets and increasing per capita consumption in Australia.

Research and Development Categories (in Priority Order)

Although priorities for research were established, these can be altered as requirements change.

Each category has been accessed and the objectives have been listed.

1. Pests and Diseases (Fruit and Tree)

- To supply industry with strategies to control pests and diseases using IPM/biological management systems that are cost effective in order to maximise yields of highest quality fruit.

2. Quality Assurance

- To develop and implement quality assurance systems from field to consumer and therefore increase consumer demand and improve marketing ability by supplying consistent quality fruit to domestic and export markets.

3. Rootstock

- To develop rootstocks which give growers choices that are suitable for their growing areas, i.e. high yielding, disease, salt, lime and cold tolerance in order to increase industry productivity and profitability.

4. Fertiliser and Plant Nutrition

- A workable model of the relationship between the inputs of fertilisers and irrigation and the outputs of yields and tree health via the mechanisms of soil biology and tree physiology.

5. Retail and Wholesale Handling

- To provide a retailer/wholesaler education program on product handling and merchandising, backed by the QA scheme, to improve quality, reduce wastage and increase sales.

6. Market Research

- To provide the industry with data which clearly identifies consumer needs, and facilitates precise targeting of marketing programs in order to increase per capita consumption of avocados.

7. Yield Productivity/cultural Practices

- To supply growers with cultural and planting density strategies to maximise sustainable yields in order to achieve cost-effective productivity of 32 tonnes/ha.

8. Scion Varietal Improvement

- To supply the industry with improved varietal strains to extend the harvest season with preocious, high yielding, semi-dwarfing, pest and disease resistant attributes with a clear understanding of influences of agronomic and climatic interaction on fruit quality.

9. Technology Transfer

- To provide to all sectors of the industry technology transfer packages which disseminate relevant information, enhance the skill levels and stimulate demand for knowledge to ensure continuing growth and viability of the Australian avocado industry.

10. Total Management

- To develop a management package and make it available to growers, in order to improve production, marketing and management skills.

11. New and Value-added Products

- To supply industry with technology for processing avocados to produce marketable value added products, such as babyfood, petfood, cosmetics, oils,

snack food, including non dairy ice-cream, semi-processed, frozen halves, skin, in order to increase per capita consumption.

12. Irrigation and Water Management

- To supply growers with strategies to optimise irrigation management in order to maximise the cost effective and sustainable use of water resources.

13. Disinfestation

- To develop disinfestation treatments in order to obtain access to restricted markets and expand markets.

14. Product Handling

- To have available cost effective handling and packaging systems which preserve quality and protect fruit while reducing the cost of packaging by 50% in order to improve quality and reduce wastage.

15. Crop Forecasting

- To supply the avocado industry with a mechanism for accurate crop forecasting to facilitate orderly and profitable marketing, including weekly market throughput information.

16. Orchard Floor Management

- To supply growers with sustainable orchard floor management systems to optimise tree health and maximise production efficiency by chemical/biological (IPM)/mechanical means.

17. Storage

- To provide the technology to achieve two months storage with resultant consistently high quality product.

18. Harvesting

- To achieve lower harvesting costs per unit through smaller high yielding trees and improved harvesting aids in order to improve eating quality through the harvesting of fruit at optimum maturity.

19. Transportation

- To supply transport companies with the necessary information so that they can improve their operation and thereby include transportation within the QA system
- CA transport systems to be made available to ensure optimum quality for consumers.

20. Soil Quality

- To provide growers with strategies to optimise soil management in order to maximise the cost effective and sustainable use of soil resources.

Low Avocado Yields Explained

By George E. Goodall, Agricultural Consultant in Santa Barbara - from California Grower July 1992

Many avocado growers are asking this question: "Why do I have such poor yields lately?" Have you wondered about this, too? Recently, a grower with a 10-year old orchard stated that he had never made a profit on his orchard because of low yields. Why?

Is it the poor weather conditions we've had in California in recent years? Is it due to the drought? What role has a lack of bees played in cross pollinating? Should I have pollinating varieties scattered through my Hass orchard? Have I been using the wrong fertiliser? Maybe my soil is wearing out? Is there a new disease that is sweeping through our groves? And so the questions go on and on.

There are many theories but not many clear answers.

Each local district has a different set of conditions and results. It's like a maze; can we work our way out of it? What do we know, what is speculation, and what are the leading theories or explanations?

Unprecedented Fifth Year of Below Average Yields

Average yield figures published by the California Avocado Commission for seasons from 1968/1969 through 1990/1991 are presented in the chart below. These are all-industry, all-variety seasonal averages presented in thousands of pounds per bearing acre.

For this 23 year period you will note there have been nine high yield years followed by one or more years below average. Alternately high and low yields have generally characterised avocado production patterns.

For the two peak years, 1980/1981 and 1983/1984, each were followed by two succeeding seasons in which the yields were below the average of 5,500 pounds per bearing acre. Then comes the peak yield year of 1986/1987 followed by four below average seasons, so far.

For growers in the northern part of the avocado growing area, the 1991/1992 season will be well below average again. For those that missed the freeze of December 1990 in the south, the current season will be average or above.

The California Avocado Commission average yields for these last five years were: 1986/1987 - 7,448 pounds per bearing acre, 1987/1988 - 4,775 pounds per bearing acre, 1988/1989 - 4,406 pounds per bearing acre, 1989/1990 - 3,057 pounds per bearing acre and 1990/1991 - 3,821 pounds per bearing acre.

So, low yields in the most recent four years, are a fact. The question is what brought this on.

Could It Be Caused By a Lack Of Cross-Pollination?

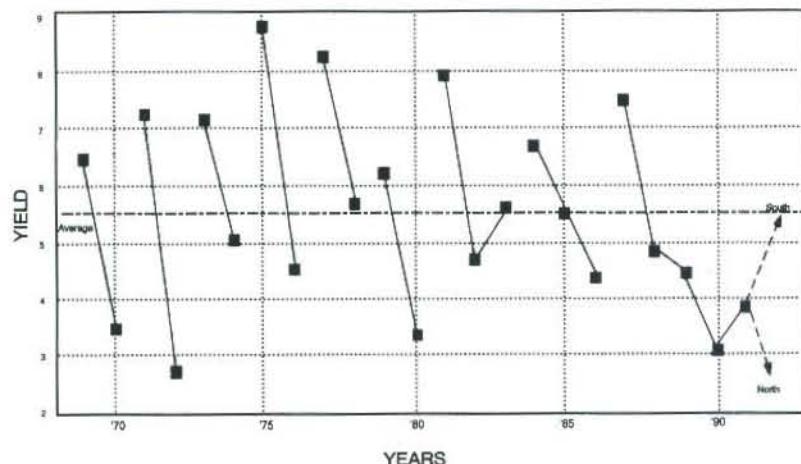
The debate on the need for growers to provide bees for pollinating trees in their orchards to improve fruit set continues and has been heightened by these four years of low yields. There is little doubt that avocado trees have blooming patterns that require pollen to be brought from another flower by some type of insect to achieve a fruit set. The relative necessity to provide honey bees and other pollinating type trees varies widely with the climate and area. The range is all the way from an absolute requirement to no demonstrated benefit.

Many growers have Bacon trees in their Hass orchards and have had numerous bee hives scattered about, but have suffered poor yields along with other growers without such conditions during this period. The lack of optimum pollination may be a partial explanation for some groves for certain seasons but is an unlikely reason for the whole industry for this many years.

Have I Used the Proper Fertiliser Program?

There is little doubt that good fertiliser practices enhance yields. Nor is there any

CALIFORNIA AVOCADO YIELDS



Major Weather Incidents

April 1989 - Week of temperatures over 100°F, with maximum's as high as 110°F.

Summer 1989 - Drought! Many water districts began water rationing to groves.

March to June 1990 - Wide temperature fluctuations, weeks with minimum's below 50°F to maximum's over 110°F in last week of June.

Summer 1990 - Drought! Most water districts rationed, some as much as 45 per cent of normal.

December 1990 - Freeze during Christmas week, worst in many years in northern districts.

Summer 1991 - Drought! Water districts continued rationing.

Effects on Avocado Crops

Cooked bloom and small fruit on trees, resulted in low set for 1989/1990 season.

Moisture stress on trees caused premature shedding of 1989/1990 crop.

Much of bloom and small fruit shed from the trees reducing the 1990/1991 crop.

Moisture stress reduced set for 1990/1991 season.

Destroyed many potential blooming branches, trees did not bloom for the 1991/1992 crop, severely damaged trees will not set well for 1992/1993.

Moisture stress reduced set for 1991/1992 crop.

evidence that our avocado soils are wearing out. What we need to strive for is to provide to the trees what they need in the way of nutrients so that when everything else is favourable, the trees will set and mature large crops. It is unlikely that the fertiliser practices of the whole California avocado industry on so many soil types are so poor that four years of low yields would occur.

Avocado Orchard Management Should Strive To Provide All Inputs and Protections

Numerous other ideas have been expressed as possible reasons for this series of below average crops. But it seems that the grove manager's goal is to provide every input that will keep the trees growing in their optimum condition for maximum yields and to provide protection against adverse conditions that would reduce that crop. That is the challenge for each grove manager to do the best that can be done for the orchard in that situation.

But there comes a time when it seems that fate is against the conscientious

grower, when a series of events occur that are beyond his or her control. Apparently this has happened with these adverse weather events during the past three years and we need to understand it. In this way, we can continue to sharpen our management practices.

Is It The Adverse Weather Events That Have Occurred?

The leading contending explanation for these successive, unprecedented, low-yield seasons is an unfortunate series of bad weather events. The boxed Table on the previous page lists the general weather events that have broadly effected the avocado growing districts of Southern California.

You may not have suffered all these ill-weather events in your grove, but it appears that enough growers did that industry production has been reduced. The above-cited adverse weather incidents reduced normal yields for the following seasons: 1989/1990, 1990/1991, and 1991/1992. These are the same three years in question for their below normal yields.

Aerial Spraying

About one hundred Avocado growers in the Bay of Plenty area of New Zealand are using aerial spraying to increase the quantity of avocados suitable for export. With 20 year-old trees reaching 7-9 metres tall, conventional airblast spraying is not reaching the leafrollers living in the upper branches. It has been estimated that 50-70% of the fruit grow in the top 20-30% of the tree.

Aerial spraying has increased export quality fruit from 60% to 80% of the available crop. Packhouses have reported getting less reject fruit.

The aerial spraying is carried out by helicopter and besides spraying for leafroller, up to ten different sprays are being applied. The sprays used include Kocide, Basudin, Atack, copper sprays, oil, zinc and boron.

All those involved in aerial spraying are sensitive to local community concern to chemicals and chemical spray drift and spraying is not carried out where it may affect neighbours, especially children.

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