

Avocado

INDUSTRY ANNUAL REPORT
2011



Horticulture Australia

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The projects in this report have been funded by HAL using the avocado levy and/or voluntary contributions from industry with matched funding from the Federal Government for all R&D activity.

CLIMATE CHANGE RD&E

Climate change research is not new, but the urgency of information for growers to understand and be able to respond to the threats of climate change is. Since 2007 HAL's climate RD&E investment, through industry levies, voluntary contributions and matched Federal Government funds, has increased by 30%. Achievements include: empowerment of industry leaders, through forums and presentations; partnerships, through cross-collaborative programs; and adoption, through grower workshops and fact sheets.

Further climate RD&E is planned in 2011, including generation of information on the critical temperature thresholds of a number of horticulture crops, identification of best management practices on-farm for reducing emissions and linkages with the Climate Change Research Strategy for Primary Industries (CCRSPI). Information on Climate RD&E and links to various tools for industry are available at www.horticulture.com.au/climate.



Overview

Avocado production levels grew in 2010/11 despite challenging climatic conditions. Widespread rainfall during the year benefited some regions such as the Riverland and Sunraysia districts, but caused difficulties for growers on the east coast. Dry conditions continued in the west for much of the year. Demand for Australian avocados has remained strong, assisted by a well targeted and innovative marketing program.

Exports have also continued to grow, albeit off a small base, with Singapore and Thailand being the largest export markets.

Levy investment

In 2010/11 the total levy income received was \$3,813,378. The current levy rate is 7.5 cents/kg. A total of \$2,164,653 was invested into R&D projects and \$1,692,422 towards marketing projects. The Australian Government provided \$1,236,508 of matched funding to support the R&D levy program.

In addition to levy funds, \$456,213 of voluntary contributions (VC) was provided to the industry for supplementing levy-funded projects and/or solely funding VC-only projects in the R&D and marketing programs. VC funds are matched by the Australian Government.

HAL is responsible for managing these funds and takes advice on how to invest the funds from the Industry Advisory Committee (IAC). Consultation with the IAC is essential in determining the most critical investment priorities for the industry. In addition to ongoing priorities, new R&D priorities set by the IAC for 2010/11 included:

- Overcoming variable production/alternate bearing.
- Alternative management strategies for fruit spotting bug.

The industry also contributes 3% of levy and voluntary contributions (matched) to an across industry program that addresses issues that affect all of horticulture, such as water availability, climate change, biosecurity, and market access.

Strategic objectives

The process for determining the industry's priorities begins with the development of the industry's strategic plan. The plan guides future R&D and marketing investment over a five year period. Activities in the 2010/11 period were therefore guided by the Avocado Industry Strategic Plan 2005-2010. During 2010/11 a new Avocado Strategic Plan was developed to guide investment over the next five years.

These plans are developed to reflect both the industry's priorities and the Australian Government's rural R&D priorities. The plans are reviewed regularly.

The industry's objectives, as outlined in the new strategic plan, are:

1. To build a sustainable and competitive supply of Australian avocados to meet consumer needs.
2. To increase demand for Australian avocados.
3. To ensure appropriate organisation, resourcing and management of the affairs of the Australian avocado industry to support the development of the industry on an ongoing basis.

R&D program

Improving fruit quality at retail level is an ongoing priority with much of the R&D investment directed towards achieving this outcome. Improving disease management, improving flow of product through the supply chain (through Infocado) and

providing better information on product handling to supply chain participants is all contributing to improving retail quality. Quantitative monitoring of retail quality has shown that improvement has been made over the past two years.

R&D levy funds have also helped with the development of new market channels such as the food service sector. As a result of an extensive program of chef training during 2010-11, many in the food service sector are much better equipped to incorporate avocados into their menus.

In terms of productivity, R&D is underway to tackle the problem of variable/alternative cropping. Also, new, alternative production techniques are being tested on farms to evaluate their effectiveness. Management of fruitspotting is being tackled with a large multifaceted R&D project initiated in 2010/11, funded by multiple industries. A project was initiated in 2010/11 that will package best practice information in an Internet based content management system to make the latest best practice recommendations readily available for levy payers.

Marketing program

The consumer marketing program has continued to evolve in order to increase frequency of purchase. The use of digital technology is becoming a more important part of the program and is integrated across all components of the campaign. However, the majority of advertising investment continues to be in TV and magazines. Beyond the consumer campaign, other areas of significant marketing levy investment include advertising to the food service market, PR support for the early childhood education program and further development of the partnership with the NRL to promote avocados.

Conclusion

This report provides a snapshot of project activities in the 2010/11 year. The report's sections are divided by the industry's objectives to reflect the activities being undertaken that address these industry issues.

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OBJECTIVE

1

To build a sustainable and competitive supply of Australian avocados to meet consumer needs

Improving yield and quality in avocado through disease management

Project AV10001 continues on from AV07000, and focuses on management of soil-borne and fruit diseases which limit productivity of avocado. It is important to evaluate and improve the disease management practices currently employed, and also to assess new approaches in an environment demanding cost effective methods of production which are acceptable to local and international markets.

The project has identified that brown root rot, caused by the fungus *Phellinus noxius*, represents a significant constraint to current and potential productivity of the avocado industry in some eastern production areas. This fungus infects healthy roots through contact with infested roots in soil, and slowly kills trees. With the commencement of the second phase of the project, a trial was initiated in July 2011 to assess efficacy of various treatments applied to planting spaces infested with the fungus. Nursery trees will be planted into these spaces and their growth and survival monitored. A second long-term trial investigating curative and protective effects of treatments to trees will commence later in 2011.

Anthracnose and stem end rot diseases cause considerable losses after harvest, and the project has evaluated some "non-traditional" approaches and products to potentially assist in their management. In the 2010 season, three products applied during fruit development reduced postharvest disease at two trial sites. One is an improved formulation of mancozeb fungicide. Another is a calcium-based product, which also enhanced the Ca in fruit peel at harvest, contributing to the improved quality of the fruit. The third product has been widely reported to enhance plants natural defence responses, although the mechanism in avocado requires further investigation. These products, and their combination with a standard industry fungicide, azoxystrobin, have been included in trials which were harvested in June 2011. Results will be analysed and reported to Industry.

Projects AV07000 and AV10001

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Coordination of export development for Australian avocados

The aim of this voluntary contributions (VC) funded project was to build the export culture of the Australian avocado industry by increasing growers' understanding of the benefits of exporting as well as the considerations and requirements to meet international marketplace needs.

Work has been carried out for larger profile avocados to be sold. Promotional activity in export countries has been very successful and the ongoing training of the post-harvest handling with retailers and wholesale staff.

Continuation of the Avocado Export Development plan reached a high when export sales of 173,094 tray equivalents were reached in the 2010/2011 season.

This project is now in its final stages and there is a need to explore other countries and their viability to buy or market avocados profitably and to see the potential volumes they would require.

Project AV09005

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Avocado QA development and training for Thailand and South East Asia

The objective of this voluntary contributions (VC) funded project was to bring to Australia a group of Thailand retail chain key personnel to provide comprehensive training in best practice procedures for the handling, storage and display of avocados.

Thirteen representatives from the major Thai retail chains together with the key importer participated in the program.

The first stage of the study tour involved gaining an understanding of the production of Australian avocados. The second stage covered the Brisbane Markets, the Coles Distribution Centre, a Woolworths retail store and an

independent retailer.

Training in QA handling and retail display was conducted at Maroochydore Research Centre.

DEEDI and Sunfresh had previously developed Quality Assurance Manuals for use in overseas markets. These Manuals were refined in terms of the cultural and business context of the Thai retail market and used for hands-on and comprehensive training of best practice procedures.

Project AV09032

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Rootstock improvement for the Australian avocado industry

The avocado rootstock improvement project has been running for nine years and during this time results have been reported via articles in *Talking Avocados*, industry and international conferences and at two R&D road shows. A paper will be presented on the project at the September 2011 World Avocado Congress in Cairns. The project has been evaluating avocado rootstocks selected from the three botanical races within this species for their suitability to meet the requirements of the diverse production regions of Australia. Rootstock production and postharvest performance have been evaluated and results reported when available.

Postharvest assessments from the last three crops have been completed at most of the rootstock sites. While there is variation between sites, propagation method, scion cultivar and season, some trends are starting to emerge.

Rootstocks which frequently perform well in terms of reduced postharvest disease levels after ripening at 23°C include 'A10', 'SHSR-03' and 'Velvick'. Conversely, those which tend to be associated with higher postharvest disease levels include 'Zutano',

'Barr Duke', 'Thomas', 'Hass' and 'Reed'.

The rootstock experiments have now completed their fourth year of production and there are some trends beginning to show in the data with respect to rootstock performance. Where 'Hass' has been planted on cloned rootstocks the highest yielding rootstocks across all sites are 'A10', 'SHSR-03', 'Velvick' and 'Zutano'. Where seedling rootstocks have been grafted to 'Hass' the highest yielding rootstocks are 'SHSR-02' and 'Velvick'.

In the 'Shepard' experiment on cloned rootstocks 'Shepard', 'Thomas' and 'A10' are the best yielding lines while on seedling rootstocks 'Velvick' and 'V1' are the two highest yielding lines. When comparing the performance of cloned against seedling rootstocks there is a trend across most sites of higher production from 'Hass' grafted to seedling rootstocks.

Project AV08000

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Figure 1. Measuring tree volume for yield efficiency calculations.

Phytophthora root rot resistant avocado rootstocks

Phytophthora root rot is the most serious and important disease of avocado worldwide. The causal agent, *Phytophthora cinnamomi*, has over 1,000 hosts and is a primary constraint on avocado productivity in Australia. Growers are estimated to spend approximately \$10million/year on chemical prevention practices and other cultural practices.

Through this project, RNA silencing is being used to engineer avocado rootstocks for resistance to Phytophthora root rot without any modification in the scion. The proof of concept for the technology has now been established using model species *Arabidopsis thaliana*. The *Arabidopsis* plants carrying these constructs show resistance to *P. cinnamomi*. The average root growth for plants carrying RNA silencing was more than double, compared to wild type control plants, when grown in soil heavily infested with *P.cinnamomi*.

Somatic embryo production from various avocado rootstocks has been optimised. There are now more than 100,000 somatic embryos in the repository made up of Reed, A10, Velvick and Duke 7 rootstocks. The efficiency of regeneration of the somatic embryos has improved from 5% to 40%. Transformation of somatic



Generation of *P. cinnamomi* resistant avocado rootstocks

embryos to impart RNA silencing based disease resistance to Phytophthora root rot is a progressive activity targeting approximately 10,000 somatic embryos every fortnight. In addition to somatic embryos, other new approaches are also being tested for transformation of rootstocks. There are potential transgenic plants that have been de-flasked from tissue culture to small pots in a growth cabinet. Further analysis and multiplication of these plants is in progress.

The project will deliver potential economic benefit to the avocado industry, which loses approximately \$40 million annually in production and management costs due to Phytophthora root rot.

Project AV08002

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Developing sustainable orchard management practices

There are increasing demands on growers to optimise fruit quality and yield, reduce chemical use and develop market opportunities to remain competitive. An increase in public awareness and concern for the environment has also led to a significant increase in consumer demand for 'safer' food and more environmentally sensitive production methods.

The objective of this project is to identify sustainable orchard management practices used by avocado growers across Australia; conduct trials to evaluate the effectiveness of these strategies; and provide recommendations on the most promising practices.

Evaluate orchard management sites

A total of 25 sites have been selected as case studies from the major production areas across Australia (including north, central and southern Queensland, northern and central NSW, the Tri-State area and WA). Growers from each site provide information on the timing and cost of their orchard management operations and the impact of these practices on tree health, yield and fruit quality.

A range of orchard management practices and products are being used at these sites, including: mulching, natural mineral fertilisers, brewed microbes, fish and kelp concentrates, molasses and branch scoring.

Conduct orchard management trials

Trials have been established to test the affect of several orchard management strategies on tree growth, fruit quality and yield compared with current industry practices.

Mulching trials

Filter-press, avocado woodchip and cane-tops were applied to 3½ year old Hass trees in Central Queensland in September 2010. A grower treatment (inter-row slashings with a thin layer of filter-press of less than 2cm) was included for comparison.

In the second year of the experiment, mulching with avocado woodchip increased in yield with 97.7 kg/tree compared with 70.5kg in the grower treated trees. Avocado woodchip also tended to reduce the severity and incidence of fruit rots.

Soil and foliar treatments

A preliminary trial indicated that pyroligneous acid (PandA®), an organic liquid derived from bamboo, tended to improve fruit quality. An additional trial was established in the 2010/11 season where monthly foliar treatments were applied alone or in combination with a copper fungicide.

A nitrogen fixing microbial product (TwinN®) was applied either as a soil drench or as a foliar spray. Treatments were applied in August 2010 (prior to flower opening), in November 2010 (maturity of the spring growth flush) and in April 2011 (maturity of the summer growth flush and prior to floral bud development). Root growth was assessed three months after treatment. There were more roots present in trees receiving soil applied TwinN® compared with the untreated trees after the first application. The effect of these treatments on fruit quality is currently being assessed and results will be reported to industry.

Branch scoring trials

The effect of branch scoring on fruit size and yield was investigated at several sites across Australia during the 2010/11 season. Results indicate that branch scoring may provide a non-chemical approach for increasing cropping in vigorous avocado



Photo 1: Root growth 3 months after soil applied TwinN®



Photo 2: Root growth in untreated trees

trees and may be a useful strategy to get regrowth in stag-horned trees back into production earlier.

Project AV08020

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Development of best practice guidelines for avocado ripening

The manual on optimal ripening systems for Australian avocados developed by this project will be ready for release at the World Avocado Congress to be held in Cairns in September 2011.

The manual is a result of the need to document practical ripening systems. To understand the commercial reality of ripening fruit, the project team worked with a commercial collaborator, Costa Exchange, to monitor handling systems from the pack shed to dispatch. This exercise allowed the team to gain an insight into the supply and demand of ripened product and the constraints of ripening systems.

The investigation also identified a number of questions which required R&D trials to be answered. These included the optimum conditions for handling partly ripened Hass and Shepard avocados and the effect of high carbon dioxide on fruit ripening. Trials were repeated this year with early season fruit to ensure that the results are applicable to the whole season. The results have been included in the manual and have been the topic of a number of articles in *Talking Avocados*.

Project AV08018

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Avocado retail quality surveys phase II

Consumer sensory testing has shown that 85% of consumers prefer to buy avocados at a level of ripeness between ripe to soft ripe that they can eat that night. Furthermore, internal quality defects of more than 10% impact negatively on future purchase intent. Based on this information the industry standard for maturity (Dry Matter %) for Hass was adjusted from 21% to 23% at the time of harvesting; Shepard remained at 21%. Research showed that consumer acceptance of the quality of avocados declined from around 95% to 70% if the Hass DM is below 23% and that around 70% of consumers would choose 26%DM avocados over 22%DM avocados.

In order to benchmark industry performance against these standards, two

programs have been developed. Firstly, monthly fruit quality surveys are conducted in 16 stores in Perth, Brisbane, Sydney and Melbourne. A random sample of avocados (up to 240) are purchased each month to assess internal quality blemishes including bruising, internal rots, vascular browning, diffuse flesh colour and stem end rot.

In order to look at how the current level of quality at the retail level matches up with consumer preferences, analysis of the data up until December 2010 is being completed by an independent statistician.

Secondly, random DM % testing is conducted each month from fruit sampled from the Sydney markets to measure fruit maturity. Up to 220 individual avocados are sampled each month and the aggregated results of these tests are reported on the Avocados Australia website. Results for individual growers and/or packers are also

sent to those businesses.

This information allows the industry to build an understanding of its performance against its strategic targets.

Project AV08034

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The team of Retail Survey Assessors cut, examined and discussed how to identify a number of quality issues.

National avocado quality and information management system

Two of the main issues that impact on the returns to avocado growers are related to fruit quality management and the efficiency of avocado production and marketing systems. The Infocado and OrchardInfo systems work to address these issues.

Infocado has been developed to assist with the collection of timely, accurate data on the volume of avocados entering the Australian market. Its goal is to assist packhouses, growers and wholesalers in making better informed management and marketing decisions.

There are four modules in Infocado: the seasonal forecasts, the weekly forecasts, the dispatch and the wholesale modules. Each collects different information

which fits together to form one of the best dispatch forecasting systems in Australian horticulture.

Weekly reports are sent to all Infocado contributors detailing what has happened in the market in the previous week and the forecast for the next four weeks. Quarterly reports are also sent to all contributors showing aggregated industry dispatch forecasts by variety and month for the next 15 months, based on data from individual packhouses and also published in *Talking Avocados*.

OrchardInfo is a system designed to collect and report on orchard information including tree age, tree numbers, varieties, rootstocks, row and tree spacing and yields. The aim of this project is to monitor

productivity over time as well as at a regional, state and total industry level. The information gathered is used to help plan and evaluate research and development and marketing levy expenditure for the future.

In the coming months, an aggregated report will be sent to all growers who have participated in the program to provide them with both a regional and national perspective of overall production and productivity by variety and tree age.

Project AV09001

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Avocado alternate bearing research

All avocado producing regions encounter alternate bearing, with orchards producing variations in yields from one year to the next. In high cropping years prices to growers are low, while in light cropping years marketers find it difficult to supply key markets. Environmental triggers such as frost or drought can initiate these ON/OFF cropping cycles, while internal physiological mechanisms are responsible for their continuation. Research in Australia and New Zealand by Plant & Food Research is aiming to understand better these mechanisms in order to provide solutions for growers wanting to produce consistently high yields.

Results from this voluntary contributions (VC) funded study have demonstrated a close relationship between the supply of 7-carbon carbohydrates and boron to avocado flowers, with both nutrients being transported in the phloem. A shortage of 7-carbon carbohydrates will lead to a shortage of boron in flowers and thus potentially poor fruit set. High crop loads will compete with flowers for the available carbohydrates and boron and thus make the situation worse in ON cropping years. More careful timing of boron applications to match the requirements of growing fruit and canopy management to avoid

over-cropping could therefore be important components in strategies to mitigate alternate bearing.

Hand pollination can increase fruit set fivefold, indicating that natural pollination systems may limit fruit set. However, even with hand pollination and a high number of pollen grains deposited on flowers, this does not guarantee fruit set. Future research will continue to consider

flower quality (carbohydrate and boron composition) and pollen viability as reasons for poor fruit set.

Project AV10010

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International alternate bearing summit

The effects of alternate bearing (AB) and irregular bearing (IB) create major challenges for growers and marketers of avocados throughout Australia and the world. A number of individual science studies, related to avocado AB, have been conducted providing a platform for future and more integrated solutions development.

The AB problem is common to most tree fruit crops and varies in intensity. AB can manifest itself countrywide, regionally, on a specific farm and even in the branches of a single tree. AB is typically initiated by an abnormally heavy or light crop in young trees, followed by a light or heavy subsequent crop. This pattern then becomes entrained and difficult to change unless severe climatic events intervene or drastic management interventions are made. A heavy 'on' crop

results in reduced vegetative shoot and root flushing and less carbohydrate (energy reserves) build-up. Seed gibberellins may also reduce flower bud initiation. Fewer flowering and fruiting sites for next season's cropping are formed, and flowering intensity is reduced. Many complex interacting factors affect AB intensity.

Australian research capacity is limited in this area of science, as is the world. The ability to work jointly and draw on the avocado researchers and funding is the only way the Australian industry will be able to achieve a positive improvement.

The Summit

The Summit format followed Gordon Conference guidelines with the exception of a summary document produced and shared. The Summit convened world

class subject-matter experts to discuss avocado alternate bearing across the main themes or platforms, current and potential future scope of work required to provide a solution/s, key global AB resources, established a network of subject-matter-expert stakeholders and discussed a potential Consortium project framework.

The establishment of a large scale international project in partnership with New Zealand, USA, Mexico, Chile and South Africa to challenge the understanding and develop solutions for the issue of alternate bearing in avocados is still underway.

Project AV09009

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Avocado supply chain education materials phase 2

Avocados Australia, in partnership with Agri-science Queensland (ASQ, formally QDPI) has developed a series of industry education materials to fill information gaps within the supply chain and improve fruit quality. Previously developed materials have been targeted at retailers, wholesalers and packhouses: see <http://industry.avocado.org.au/EducationMaterials.aspx> for more information.

A new transport handling guide, a best practice harvest guide and a revised grading poster are due to be published in the coming months. Plans for the future include the development of interactive, online versions of the materials which can be tailor-made for individual packhouses.

Furthermore, in 2010/11 Avocados Australia targeted approximately 150

retailers in Brisbane, Queensland to build on their knowledge about how to best store, handle and present avocados and therefore improve fruit quality. The retailers were given information packs with industry updates and the retail handling guides and they were also given brief training sessions. The program is now being rolled out in

Melbourne, and Sydney will be targeted next.

Project AV10006

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Avocado Handling Wholesale Poster (above) and Packhouse Poster (below)

The Little Green Book (below)



Development of an avocado rapid library tray system for Hass

A typical library tray system involves retaining representative samples of fruit from the packing line, storing them at temperatures simulating a commercial cold chain and referring back to the stored fruit should fruit quality issues arise at the point of entry (sale). The system works well for the export market where the cold chain is constant and easily simulated. The more progressive agricultural industries use library trays not only as an insurance system but also to provide suppliers with feedback regarding their fruit quality.

The Australian avocado industry is domestic market focused with a highly variable cold chain not conducive to simulation. Therefore, a simple, single temperature storage regime was developed for avocados that could

accurately reflect end-use fruit quality. The system was initially tested for 'Hass' and later extended to 'Shepard' fruit. The accuracy of the library tray system was verified using fruit subjected to a simulation of a commercial cold chain and was found to be between 60-70% accurate for both varieties. The accuracy of the system is heavily dependent on the firmness stage at which the fruit are assessed.

In general, the quality of the library tray fruit could be assessed within approximately seven days of packing which would often precede the fruits' arrival at the distributors/market agents. Therefore, the information obtained could be used not only to provide growers with feedback regarding their fruit performance, but also to feed information forward to distributors, market agents and fruit ripeners.

This project is privately funded by Simpson Farms Ltd, CostaExchange Ltd and DEEDI, with matched funding from HAL. Encouraged by the preliminary success of the project, Simpson Farms are currently trialing the commercial application of the library tray system using the 2011 season's 'Hass' fruit.

Project AV09028

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Protecting pollination for Australian horticultural industries

The Pollination Program, managed by the Rural Industries Research and Development Corporation (RIRDC), Horticulture Australia Limited (HAL) and the Australian Government Department of Agriculture, Fisheries and Forestry, aims to ensure the pollination of Australia's horticultural and agricultural crops continues to be both sustainable and profitable.

The program is guided by the Pollination five year R&D plan 2009-2014, with primary key performance indicators as follows:

- Successful implementation of best practice surveillance systems,

determined by stakeholder feedback.

- Communication with Australian plant industries to inform them of the economic benefits of optimal pollination to their industry, and the importance of protecting pollination resources.
- Building awareness in the industry of the importance of pollination services.

Following stage one project completion, the almond, apple and pear, avocado, canning fruit, cherry, dried tree fruits, melons, summerfruit, vegetable and onion industries have indicated support for a number of stage two projects.

Project MT09026

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Protecting Pollination Program

The Pollination Program is designed to support research, development and extension activities that will secure the pollination of Australia's horticultural and agricultural crops into the future on a sustainable and profitable basis. Six projects have been funded in the last year under the Protecting Pollination Program, a research and development strategy jointly funded by Horticulture Australia Ltd (HAL), the Rural Industries R&D Corporation (RIRDC) and the Australian Government.

Permits sought for bee pest control products

An application has been submitted to the APVMA by the Australian Honey Bee Industry Council (AHBIC) as part of a project under the Pollination Program. Three Varroa mite control products, Bayvarol (flumethrin), Apistan (tau-fluvalinate) and Apivar (amitraz) have been identified as effective in aiding in the control of Varroa in New Zealand and approval is being sought for use in Australia. Following APVMA approval, the permits would be held in 'reserve' for use in the event of an incursion.

Hobby beekeepers protecting Australian horticulture at major sea freight port

The objective of the Bee Force projects is to determine if the involvement of 'hobby' bee keepers located within short distance of entry ports are able to

perform basic monitoring, to strengthen the early detection framework already in place around Port Melbourne, and enhance the current surveillance programs. This project will also evaluate the level of engagement and reliability of non-professionals, their willingness to be involved in a biosecurity project and test their level of commitment to a relatively long term pilot project that requires a certain discipline and moderate level of expertise.

Honeybee research workshop explores options

The project workshop was held in Canberra on 19-20 August 2010 at the Australian National University in Canberra. Pollination industry leaders, researchers and international experts explored options to minimise and replace the need for chemicals for the management of Varroa mite incursion. Overseas speakers discussed non chemical options including breeding for resistance to Varroa, drone brood control, temperature control, organic acids, screen bottom boards, Varroa sensitive hygienic behaviour and integrated pest management.

Evaluating a honeybee and pollination security CRC bid

The project has four key objectives, the first three being to

- Consult with industry stakeholders to assess and report on the level of interest in and commitment to establishment of a Cooperative Research Centre.

- Catalogue various industry objectives which can be addressed by a CRC-style research agenda, test these objectives for practicality, and develop a draft business plan for assessment by stakeholders.
- Prepare a reference guide to completed research of relevance to the application preparation.

Dependent on the reception of the above, the additional project objective is to:

- Coordinate the development and delivery of an application to establish a Cooperative Research Centre for the Australian honeybee and pollination-dependent industries.

Communicating the benefits of assured pollination to stakeholders

The primary purpose of the project is for Cox Innall Communications to work with the Pollination Program to develop and then implement an innovative communication strategy for the program's outputs, to facilitate adoption of results and maximise the knowledge outcomes.

Projects MT09082, MT09086, MT09087, MT09088, MT09090, MT09091

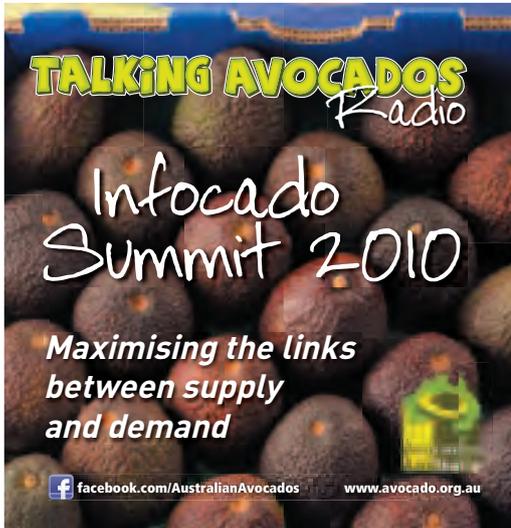
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Infocado Summit October 2010



The 3rd Infocado Summit, held in Melbourne in October 2010, was an industry event that brought together Infocado contributors from across the country to discuss the challenges that lay ahead, where opportunities lay for future growth, and how the Australian avocado industry needs to work together for the benefit of all. A key objective of this project was to ensure that the key learning's from the 3rd Infocado Summit were effectively

communicated to the wider industry.

The key learnings of the Infocado Summit were captured in the *Talking Avocados* Newsletter and the *Talking Avocados* Radio CD via interviews conducted during and after the event.

The newsletter and CD were distributed to the wider industry in December 2010 as an accompaniment to the summer 2010/11 Volume 21, issue No 4 of *Talking Avocados*. In addition to this, all presentations given at the Summit were uploaded to the industry website to view and/or download.

Project AV10007

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An international standard for mobile elevating work platforms



This project was the final of a series to produce standards for mobile elevating work platforms (MEWPs) used in orchards.

The work has covered the operating standard AS 2550.10 (published late 2007), the design standard AS 1418.10 (in the process of being published), and the international design standard ISO 16653-3 published early 2010.

Prior to this cross-industry initiative, elevating work platform standards did not recognise innovations necessary to allow MEWPs to be used safely and efficiently in orchards. Growers were at risk of dispute and prosecution from safety regulators, and civil litigation in the event of an injury involving an orchard MEWP.

The final part of the project was the development of an international standard for orchard MEWPs. Courts have been known to reference higher-level standards in injury litigation. For that reason, recognition for orchard MEWPs at international level was essential.

Project MT08013

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Research assists registration review of Dimethoate and Fenthion

Insecticides Dimethoate and Fenthion are currently under registration review by the Australian Pesticides and Veterinary Medicines Authority (APVMA), following concerns regarding toxicity, public health, occupational health and safety, the environment and residues in food.

They are arguably the two most important pesticides used for controlling fruit fly, due to legislation that requires their application to produce before it can be sold or transported to interstate and overseas markets.

Due to safety concerns, it is difficult for the APVMA to conclude that these insecticides are safe without addressing the need for new data, as the original data is now considered insufficient and out-dated.

The aim of this project is to generate new data for consideration by the APVMA, generated under current conditions and using modern equipment and use-patterns. This data is based on pre- and post-harvest uses across more than 150 field-sites including 40 different crops, which represented 12 crop-groups including brassica vegetables, root crops and tropical-fruit crops.

Project MT06022

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Cold tolerance in immature stages of Australian pest fruit fly species

There are currently no international guidelines for testing methodology for the development of cold treatments for fruit fly host commodities. Treatments to date have successfully been developed for Australian commodities after bilateral negotiations on testing methodology and identification of pest species of concern. The problem with this approach is that methodology accepted by one country may be insufficient for other trading partners.

This can lead to duplication of research and major delays in development of export protocols.

The aim of this project is to develop new testing procedures for determining the cold tolerance of Australian fruit fly species including both in vitro (artificial) and in vivo (in fruit) techniques. Preliminary dose response trials comparing different treatment methodologies have

commenced using *Bactrocera tryoni* and *B. neohumeralis*. If results indicate that in vitro techniques can be used then testing on a range of other fruit fly species will be undertaken.

Project MT10021

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Ecology and preharvest control of fruit flies

Fruit flies directly impact on crop quality and market access. Likely restrictions on the use of dimethoate and fenthion will place increased emphasis on alternative control strategies.

This multi-industry project has studied the biology of Q-fly pertinent to the development of improved management strategies. Further research has quantified when and where flies forage

for protein and male attracting lures, with the intention of developing a better method of application of protein bait-spray technology and male annihilation technique [MAT], respectively.

The attractancy of protein and male lures in different seasons has been quantified. Attractancy is lowest in winter and highest in spring. Within a crop, protein should be applied to the upper canopy to be most

effective. The fruiting cycle of the crop influences the age structure of flies and their response to protein and lure.

Project MT08036

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A multi target approach to fruit spotting bug management

Fruit spotting bugs (FSB) are a major native pest in a number of subtropical and tropical horticultural crops in Australia.

Until now, using broad-spectrum insecticides has been the only management option for growers. This approach is not sustainable in the long-term.

This multi-industry project addresses the problem by investigating the following management strategies:

- A database through collation of research and practices of fruit spotting bug management, related insects and technologies considered in the program will be important.
- Evaluation of IPM compatible insecticides, new chemistry and biopesticides.
- A monitoring and trap cropping program will be developed using highly attractive alternative hosts and

susceptible varieties.

- Biological control will investigate mass-rearing for FSB, *Anastatus*, release strategies, ecology and initial evaluation of various biological control agents.
- Improved management options through IPM case studies will be demonstrated on selected commercial farms.
- Control strategies on a regional basis will be implemented through Area Wide Management (AWM).
- Industry adoption will ensure that the research is relevant across all industries and that project outcomes will be accessible to all growers.

A project reference group has been set up consisting of industry representatives from the macadamia, avocado, lychee and papaya industries, HAL, a Project Coordinator and a leading research agency (NSW Department of Primary Industries). The Project Coordinator and NSW DPI hold separate contractual agreements with HAL.

An extension group meeting was held at Nambour in May 2011. A meeting for pest consultants, from different affected industries, including avocados was also held in Brisbane on 20 July 2011. Experimental work for pheromones, insecticide screening, biological control and a PhD study have commenced.

Projects MT10049 and MT10066

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Beating trays - Craig Maddox and Ian Purdue from NSW DPI collect FSB samples from a Cudgen avocado orchard.

To increase demand for Australian avocados

Avocado contribution to Australia Fresh program

Australia is a small player in the horticultural export market and exports around 10% of total production. Major competitors in the southern hemisphere include Chile, South Africa and New Zealand. These countries are much more export focused and have strong export marketing programs.

The Australia Fresh™ program was launched in 1995 to assist promotion of



Australian horticultural industries in export markets under a single Australian brand, thereby increasing Australia's exposure to international fresh produce buyers.

Asia Fruit Logistica (held in Hong Kong from 8-10 September 2010) was the major trade event in Asia, and the Australia Fresh™ pavilion was one of the largest and busiest at the event. Austrade assisted with introducing VIP retail buyers to participating exporters. The Australian avocado industry was promoted as a stand sponsor in all literature and logos, including the Australian networking event, whilst Sunfresh promoted avocados directly to buyers and generated trade for the avocado industry.

The world's largest trade event is Fruit Logistica, held every year in February in Berlin. This year the Australia Fresh™

stand, managed by HAL staff, provided exposure and contact with 50,000 of the world's leading horticultural industry leaders and buyers from Europe, Asia and the Middle East. Australian avocado information was distributed from the stand.

Australian avocados have also been promoted through the Asia Fruit and Eurofruit trade magazines, reaching more than 8,000 buyers in Asia and Europe, and Fresh Plaza.com, a daily fresh produce e-newsletter, which is distributed to over 25,000 readers.

The avocado industry contributed \$15,000 from marketing levies to the \$265,000 program in 2010/11. The avocado industry is now contributing to the 2011/12 program.

Project AU09505

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Australian avocados health and nutrition research

The Australian avocado industry's commitment to health and nutrition stems from the industry's identification of this area of communication as a key marketing component in their Strategic Plan 2011–2016.

In line with this objective, the Australian Avocados' Strategic Plan for Health and Nutrition Research (2011–2013) was developed (AV10015). This three year plan outlined the industry's four key audiences:

1. Influencer groups such as GP's, dietitians and nutritionists, fitness professionals, and early childhood carers.
2. Food regulators and public health and nutrition policy makers.
3. Consumer segments with a focus on 'mums with bustling families' and

'mums with start-up families and small scale families'.

4. The food service industry, particularly chefs.

The strategic plan for nutrition research outlined the industry's short and long term objectives.

- The short term goals aim to raise the nutritional profile of Australian avocados in the eyes of the key audiences.
- The longer-term goal is to own a space within the health sector that will distinguish avocados from other food groups.

The starting point for the first year's program (AV10017) was a review of the nutritional science relating to avocados. As part of this study, a review of the nutrient composition of avocados led to

the development of a number of nutrient content and nutrient function claims per 100g and 120g or half an avocado serve. This information can be used on pack labels, point of sale materials, websites, and other resource materials.

The international medical research literature was also reviewed using the Pubmed medical literature database for research papers referring to the health benefits of avocado. In total, 117 abstracts were reviewed and categorised into a number of health areas including: composition, heart health, weight management and diabetes, among others.

Projects AV10015 and AV10017

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Australian Avocados marketing campaign 2010-2011

Based on consumer research undertaken in April 2009 the industry learned that while the creative executions around 'versatility' as a message were well understood and received by the target audience, there was still a percentage of people who were not convinced. Therefore, to further push the boundaries around 'versatility', new marketing messages were explored and a new brand strategy was developed in October 2010.

The primary objective of the Australian Avocados marketing campaign 2010-2013 is to shift the target audience's perception of avocados from being a versatile product ingredient in the kitchen to an indispensable ally – a 'must have'. The campaign line has evolved to 'Add an Avo Everyday' with the aim of bringing about a shift in the buying behaviour of the target audience from infrequent to regular purchase. By instigating such behavioural change and establishing a commitment to purchasing avocados from an occasional to an 'everyday' basis, the marketing campaign seeks to achieve its goal of increasing the average weight of purchase (AWOP), which is frequency/occasions per visit x dollars (\$) spent, among light to medium users in the identified target audience.

As avocado production is expected to increase, the target audience was also reconsidered using the research conducted in 2009 and the AC Nielsen HomeScan. Target groups needed to be selected in accordance with maintaining the objective of increasing the total AWOP of avocados, as well as in line with the objective and efforts of research and development (R&D) programs targeting children. Target groups needed to be more likely to frequent shops to buy fresh fruit and vegetables, as well as be able to absorb the increase in purchase volume, securing short-term volume growth and long term market share for avocados. As a result, the target audience for the next three years is:

Primary

Bustling families

A bustling family has a mum who takes on many roles. She wants what is best for her family and looks after their wellbeing. However, she is time poor, so she is always looking for ways to make her life a bit easier.

Secondary

Start-up families

In a start up family, children come first in the house and the mum is 100% focused on 'doing the right thing' by them.

The common link between these two target groups is that they want life to be a little easier and don't know where avocados can fit in. To ensure that avocados fit into their busy lifestyles and to address some of their problems/concerns, the following communication pillars have been identified:

One fruit. Endless possibilities.

Health & wellbeing	Indispensible ally	Gives me confidence
Vitamins and mineral	Lots of uses	Recognition
Good fats	Substitute	Advocacy
Low sugar, no salt	Easy	User imagery
Good for kids	Value for money	Everybody loves it
	Family loves it	

Creative development

As the strategic intent for this campaign was to begin communicating the benefits of avocados, rather than focusing on the product attributes, there were two key requirements that the creative concepts had to communicate:

- Why avocados are an indispensable ally in the kitchen (to support the brand message).
- How to use avocados in simple and easy ways (to support the positioning line).



Heart



Light bulb



Teddy Bear



Clock

Usage shapes

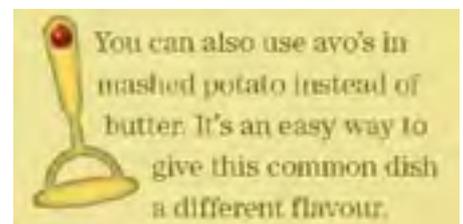
In addition to the hero shapes, the creative concepts needed to clearly demonstrate **HOW** to use avocados in simple and uncomplicated ways to support the positioning line.

Consumer research indicated that the recipes used in the current campaign didn't demonstrate ease or simplicity to the light and medium user target groups, and therefore another device was required to communicate this message.

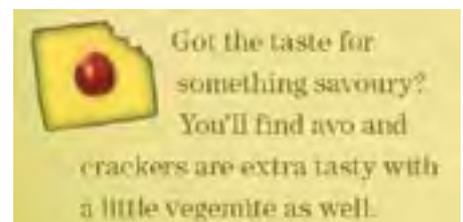
As a result, a number of 'morphed' shapes were developed to demonstrate:

- How to use an avocado, for example using the image of a potato masher for adding avocado to mashed potatoes.
- What to put the avocado with for an easy meal or snack idea, for example on crackers with vegemite.

These shapes were supported by copy that provided tips on how to use avocados and add them to every day food.



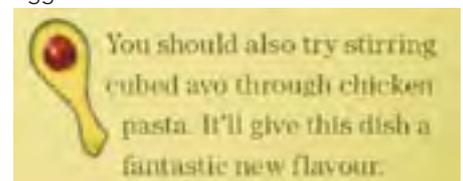
Masher



Cracker



Eggs



Chicken



These handy tips were supported by food photography to demonstrate a visual cue of how to 'add an avo' in easy ways throughout the day.



As per previous years of the campaign, recipes books were produced. Two recipe booklets were created:

- Add an Avo Every Day.
- Add an Avo to you Footy Party.

To accurately reflect the revised strategy, simple rather than complex recipes will be included in the 'Every Day' booklet. This booklet will be used in a number of ways including as part of PR and sampling campaigns.

Media strategy

Television

Television is a powerful medium to build on the versatility platform and communicate the message to busy mums that avocados are a 'useful (and indispensable) ally in the kitchen'.

For the 2010-2011 campaign period, Australian Avocados made a larger commitment to pay TV, more specifically partnering with the LifeStyle Network; Australia's only dedicated network focused on delivering women and families' entertainment and information. Partnering with the LifeStyle channel allowed the industry to develop a deeper connection with mums by being part of their 'every day' life.

- The LifeStyle Network created three 45 second interstitials (short avocado ads that ran between programs) utilising

the talent of Rachael and Kim from the program '4 Ingredients' to drive home the everyday possibilities for avocados.

- Sponsorship of the morning mums block in July and 'Come Dine with me Australia'.
- Sponsorship of the 'Everyday meals' block kicked off in August 2010 and the sponsorship continued in March and May 2011.

Results

The television activity saw avocados in the market from May 2010 to June 2011; engaging 681,000 grocery buyers (with children) an estimated 17.93 times during that period.

Magazines

Magazines are an excellent platform to present key messages such as avocado as a 'useful ally in the kitchen' and 'clever ideas for your family'. These key messages continue to deliver on the brand essence of 'One fruit. Endless possibilities.'

Results

The magazine advertising reached 69% of bustling families at an average frequency of 3.54 and it reached 66% of start-up families at an average frequency of 3.18.

Online Advertising

While developing the online advertising schedule consideration was given to placing avocados in women's lifestyle and family environments where mums actively seek information and from there drive them to the Australian Avocados website for further information.

Fairfax sponsorship in 2009/2010 performed well and they were the top referrer to the avocado website, as a result,

sponsorship was strengthened further in 2010/2011. Consumers on the Kidspot Australia website (www.kidspot.com.au) had the opportunity to enter a competition promoting the use of avocados in their every day meals. Consumers submitted their every day avocado recipes and the winner was chosen by the online community. The prize was a year's supply of avocados. The competition was also promoted by editorial support promoting the benefits of avocados.



Results

Search

- Overall, Australian Avocados has delivered a strong position in online search with the keyword 'avocado' delivering the highest traffic to the website and resulting in an average 1.3 position over the campaign to date. This refers to the ranking in SEM that the site comes up (i.e. number 1 being the best).
- The impression share for the avocado campaign increased from approximately 16% in 2009/2010 to 36% in 2010/2011.

I ♥ Footy

Following on from the success of the 2009 NRL campaign, 'Add an Avo to Footy Entertaining' returned in 2010 (active from March to September) and was hosted on a custom-built 'I ♥ Footy' micro-site (www.avocado.org.au/IHeartFooty).

Australian Avocados partnered up with individual NRL clubs to tap into large junior membership ranks.

Footy fans were encouraged to participate in a recipe competition where they had to nominate their favourite avocado recipes. The winner would receive tickets to the NRL Grand Final, a signed jersey from the winning team, as well as \$5,000 for their team's community and health programs.

The 'I ♥ Footy' site featured a team ladder that tracked the votes for the best





NRL team recipes. Public relations activity alerted local media to each club's ranking and called on football and avocado fans to log on and vote.

'Add an Avo to Footy Entertaining' was put in place with a focus on grass roots and sports media and the objective to leverage players and the NRL club involvement to drive an association between football and eating avocado.

Results

In total, there were 417 clips generated in the 2010 NRL campaign, and the total audience reach was 9,189,462 people; compared to 129 clips in 2009.

Avocado website (avocado.org.au) and SEO

The online strategy over the last three years has focused on developing and delivering content on a regular basis. Website statistics demonstrate that this has proven to be effective in increasing website traffic. With a shift in target audience, the 2010-2011 digital tactics also sought to integrate all of the new marketing messages, as well as support the PR activities involved in developing a 'footy-guac' culture.

As part of the digital strategy there were also measurable objectives established for the 2010-2011 activity.

Results

Targets	July 2010 - June 2011 result
To increase website visitors from the current average 10,000 to 16,000 per month.	Consumer: 19,878.5 ↑ Food service: 852.9 Early learning: 606.8 Footy: 1,235
To maintain the returning at 20% whilst increasing the amount of visitors.	Consumer: 17.94% Food service: 23.23% Early learning: 29.1% Footy*: 23.53%
To maintain time spent at 2:30 minutes.	Consumer: 1:50 minutes Food service: 1minute 40 seconds Early learning: 1minute 49seconds Footy*: 2minutes 46seconds
To increase the average depth of visit from 3.2 to 3.8 pages.	Consumer: 2.86 pages Food service: 2.11 pages Early learning: 2.06 pages Footy*: 3.67
To increase the consumer database from 8,000 to 16,000 contact during the 09/10 plan.	Consumer database: 17,562 unique contacts ↑ Food service database: 245 unique contacts ↑

Search Engine Optimisation (SEO)

Google ranked as the number one referring search engine for all four websites. The top ranking keywords from the search engines for the consumer website were 'avocado', 'avocado tree' and 'avocado dip'. The top ranking keyword for the Food Service site was 'chocolate avocado mousse' and 'avocado foam', and the top ranking keywords for the Early Learning website were 'avocado nutrition' and 'avocado'.

Early learning program

A study completed in 2009 identified early childhood teachers and carers as being key influencers in child education settings. Identifying a key opportunity, the avocado industry initiated the Australian Avocados 'Eating my colourful vegies and fruit' program to equip early childhood educators with knowledge and resources about healthy eating and food learning with a special emphasis on avocados.

Using the expertise of two noted nutrition educators, Shelley Woodrow and Nadine McCrea, an avocado-focused education resource package was developed with the title of 'Eating my colourful vegies and fruit.'

Australian Avocados 'Eating my colourful vegies and fruit' was launched at the KU Centennial Parklands Children's Centre on the 17 August, 2010. In total, at the end of round one and two, 408 centres signed up.



The early learning kits in action at the launch at Centennial Parklands Early Childcare Centre.



A new 'Early Learning' micro-site (www.avocado.org.au/EarlyLearning/) was created on the Australian Avocados website to introduce, promote and support the Australian Avocados 'Eating my colourful vegies and fruit' program.

Food Service

Although avocados are loved by consumers, they haven't been widely adopted by chefs and as a consequence they don't feature in many restaurant menus. To seize this opportunity, the 'Avocados Australia - Fresh Avocados Chef Training Program' was developed with the objective of engaging the food service sector (restaurants, cafés, clubs, hotels and pubs) to increase the use of avocados in their menus.

Leading chef Victor Pisapia, of Victor's Food, runs some of the avocado chef training classes. The masterclass gives an introductory insight into the history, world usage, global production, types and nutritional benefits of avocados. Chefs are also given the 'Fresh Avocados Masterbook for Food Service', containing information on seasons, handling, storing, purchasing, myths and tips.

In 2010/2011 the 'Avocados Australia - Fresh Avocados Chef Training Program' was launched in two new sectors and tested



Kate McGhie, Allan Koh (above) and culinary students (below) attending the Australian Avocados Chef Training Program held at Melbourne's Crown Metropol.



in two new states. Vegetarian masterclass sessions were held with commercial catering group Alliance in Western Australia, South Australia, and along the eastern seaboard. The program is also being introduced into the TAFE curriculum, accompanied by specifically developed educational materials.

A total of 14 chef training classes were run 2010/2011:

- Commercial Caterers (Alliance) – one in each of the following states: QLD, NSW, SA, WA and VIC.
- Star Hotels – one in each of the following states: QLD and VIC.
- TAFEs – one in each of the following states: NSW, QLD and VIC.
- Restaurants – one in each of the following states: VIC, NSW and QLD.

The food service strategy was supported

by the 'Food Service' micro site (www.avocado.org.au/foodservice), media and foodservice PR activities.

Education program targeting fitness professionals

Australian Avocados partnered with the Australian apple and banana industry to develop a pilot education program targeting 200 fitness professionals on the benefits of eating and recommending the consumption of apples, avocados and bananas.

To achieve these aims, the industries partnered with the SmartShape Centre for Weight Management and its Director, Matt O'Neill.

Matt's 'Metabolic Jumpstart' (MJ) program provides an existing framework to design

and deliver the campaign, without the need to reinvent many costly components. MJ has been very successful in harnessing social media (YouTube, Facebook, and Twitter) as educational tools and these elements will be heavily utilized in the campaign.

The program was launched at the Woolcock Institute of Medical Research in Sydney on 29 March 2011. The event was publicised via online and social media channels reaching a total audience of up to 20,000 fitness professionals in Australia.

Projects AV10500, AV10516, AV10005, MT10048

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Identifying bioactive components and portion size in avocados for consumer health

This project aimed to collect new data on the levels of nutrients and bioactive compounds in Hass and Shepard avocados to update the current nutritional content information available to health professionals and consumers.

The most promising results to emerge from the project were in the area of nutrient labelling and source claims.

There are several important nutrients which were found to occur at high enough levels in Australian avocados to justify nutrient claims. These are: total phytosterols, monounsaturated and polyunsaturated fatty acids, folate, Niacin (Vitamin B3), and total dietary fibre.

Hass and Shepard avocados were found to be consistently high in phytosterols which means that avocados have the potential to reduce blood LDL cholesterol levels and provide consumers with the associated beneficial effects on their cardiovascular health. High levels of monounsaturated fats were also confirmed and this finding adds weight

to the idea that avocados have significant potential benefits on cardiovascular health.

Avocados are an excellent source of dietary fibre, at a high enough level for a good source claim. Avocados should be actively promoted for their dietary fibre content. Avocados are also a good source of folate, which is necessary for normal blood formation and is essential for normal cell growth and development, especially during pregnancy. The level of folate is high enough in all the samples measured to date for a good source nutrient claim.

The Niacin content in avocados was high enough across all the growing districts and cultivars sampled to make a source claim for this nutrient.

Project AV09000

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Understanding the purchase behaviour of fresh produce consumers

Avocados are one of Australia's most successful fruits, with around 66% of Australian households purchasing avocados during any given year. Good market information is vital to ensure that the market is supplied in the quantities needed throughout the year. Collecting information on purchase patterns helps the industry to gain a better understanding of consumer behaviour and allows for an effective promotion program during this time.

Consumer information was collected via the Nielsen Homescan™ panel and retail Scandata.

Information from both sources helps the industry understand market development opportunities and identify areas where sectors are over or under performing. Overall the data has helped to understand more about the dynamics in the market and the likely purchase behavior patterns in periods with larger or smaller supply capability.

Project MT10017

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Consumer tracking study

The consumer tracking survey is conducted six times a year, collecting information from 600 consumers at a time. Now in its fourth year, it is funded by seven participating industries (apples and pears, avocados, bananas, grapes, macadamias and mangoes) for a cost-effective provision of information on consumer preferences and attitudes, incidence of purchase and reaction to assorted education and promotional activities.

The overall brand strength for avocados continues to grow on the foundation that the brand has been long established.

Key features of the brand health include:

- Good residual awareness of advertising over time with avocado print advertising demonstrating the highest awareness of all brands being measured.
- The 'good fat' and versatility messages continue to come through, making avocados a unique and premium product amongst the fresh produce sector.
- In the most recent wave of research, the television and print advertising TVC and print ads tested very positively.
 - News and facts within the television commercial have been well received and the print advertisements have appeal, standout and positive impact on purchase intent.
 - Commitment to a consistent mnemonic device and colourful branding is paying dividends in terms of TV and print recall.

Project MT06020

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Export-import market intelligence

This project focuses on Australia's export and import trends and forecasts of participating industries. The multi-industry project has been funded using R&D levy from eight industries and matched contributions from the Australian Government.

The project uses the Global Trade Information System (GTIS), which is a database containing trade data from different sources for different countries. The data comes from different country departments of trade and customs organisations. Data is acquired on the volumes of trade, value of trade and per unit price. GTIS is a valuable source of data for exporting industries and local industries alike.

Besides information contained in GTIS, this project uses other international trade reports, and key contacts in export markets to delve deeper into the landscape and development of global trade. This includes further analysis on prices, market weaknesses, strengths, opportunities and threats based on researched data in the key and emerging markets for set industry commodities. Participating industries receive quarterly trade reports covering volume, value, prices and trading countries.

Project MT10022

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Avocado retail price surveys: supply chain transparency

The Australian avocado industry is experiencing a large growth phase. With increased volumes of fruit in the marketplace it is important that fruit moves through the system quickly and that supply of fruit and price fluctuations are evened out.

Giving growers a more transparent supply chain and a better understanding of retail prices and market forces each week, avocado prices from 16 separate retail outlets each in Perth, Melbourne, Sydney and Brisbane are collected. This information is sent out with the weekly Infocado Report to industry members who contribute to the program and is also publically available on the Avocados Australia website.

This program links the data relating to how much fruit is being supplied, to where that fruit is ending up, how it is being purchased and by whom. With access to this information growers have been able to anticipate and respond quickly to changes in the market.

Project AV07023

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To ensure appropriate organisation, resourcing and management of the affairs of the Australian avocado industry to support the development of the industry

Avocado industry communications strategies

The avocado industry communications strategies project provides the Australian avocado industry with a mix of communication tools with the objective of sharing explicit industry-related knowledge to grow and improve the business prospects of Australian avocado growers. This project will provide growers and associated businesses with factual and timely information relating to industry issues and their businesses.

Effective communication is critical to remain in business in today's market; as such, communication forms the basis of the avocado industry's objectives. Monitoring the influx of information pertaining to avocados will assist businesses in running

their operations.

The avocado industry website is the primary communication delivery method for this project as it allows the reporting of both relevant and timely industry information. Throughout the 2010/11 period such information included, but was not limited to:

- A daily newsfeed of national and international horticultural news articles on the industry homepage.
- The Australian Avocado Industry Strategic Plan 2011-2016.
- Weekly avocado retail prices.

- Bi-monthly dry matter results;
- The last 20 years editions of *Talking Avocados* available to view online or download.

Talking Avocados continues to be the industry's quarterly publication. It is a clear and succinct magazine that integrates email, web site and hard copy correspondence. This is the most effective communication delivery method for the avocado industry.

Other communication delivery methods include generic and grower or industry-specific emails; general (written) communication; face-to-face meeting/briefs for more direct communication; as well as presentations, conferences, and forums in order to reach large numbers of key stakeholders. In 2011 this involved an Avocados Australia exhibition booth at PMA Fresh Connections held in Brisbane from 8-10 June 2011.

A review of the industry communication strategies will be undertaken in 2011 as part of the new industry strategic plan.

Projects AV08025 and AV08045

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Distribution and incidence of avocado sunblotch viroid

Sunblotch disease affects both the yield of avocado trees and also the quality of the fruit. Sunblotch disease is caused by the smallest pathogen known to science, avocado sunblotch viroid (ASBVd). Fortunately, ASBVd is not very contagious and can easily be controlled by avocado growers using clean planting material. To address this need, the Avocado Nursery Voluntary Accreditation Scheme was initiated in 1978. Nurseries participating in ANVAS are obliged to have avocado nuclear stock tested for ASBVd on a regular basis.

Prior to the commencement of this project, there had been no official record of ASBVd in Australia since 1989. Questions therefore arose as to whether this pathogen still occurred in Australia, if so, how common it is and to what degree does it affect production? To answer these questions, surveys were taken in the subtropical production areas of northern NSW and south-eastern Queensland.

To allow survey data to be collated in a central location, a web-based database was created. It is intended that this database

be hosted on the Avocados Australia web server. When operating, growers will be able to establish their own a private account, allowing them to submit sample details online. In turn, results from the laboratory can be uploaded into the database and linked to the sample submission details.

Project AV07001

For more information contact:

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Biosecurity capacity building - laurel wilt

Laurel wilt, caused by the fungus *Raffaelea lauricola*, is one of the most immediate and serious biosecurity threats to the Australian avocado industry. This pathogen is transmitted by the ambrosia beetle *Xyleborus glabratus*, a native of Asia. *X. glabratus* has a symbiotic relationship with *R. lauricola*: female beetles bore into the sapwood of trees to create brood galleries and at the same time inoculate the tree with the fungus. The beetle larvae then feed off the fungal hyphae as it colonises the wood.

The potential for establishment of *X. glabratus* in Australia seems quite high since there are many potential hosts,

including native rainforest trees (*Litsea*, *Neolitsea* and *Cryptocarya* spp.) as well as weeds such as Camphor Laurel (*Cinnamomum camphora*). To date, laurel wilt has not yet been recorded in Australia, however, there is the need to establish a diagnostic capacity for laurel wilt in case an incursion occurs.

The aims of this project are to develop a surveillance and diagnostic capacity for *X. glabratus* and *R. lauricola* in Australia.

Diagnostic protocols developed in the USA will be validated to ensure that they are capable of discriminating these exotic organisms from endemic relatives. Finally, a diagnostic manual will be produced.

Project AV10004

For more information contact:

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Avocado best management practices

There are currently no up-to-date production guidelines for Australian growers. The Agrilink Avocado Information Kit published in 2001 is now out-of-date and out-of-print. This new project aims to provide growers with information resources to help them produce high quality avocados in a competitive and sustainable manner.

The main focus to date has been writing text and sourcing photographs for the 'Avocado Problem Solver Field Guide'. This hard copy guide will help industry members to identify avocado problems including pests, diseases and deficiency symptoms.

Once this field guide is complete, work will commence on the development of an Internet based content management system. This system aims to provide growers with key information on best management practices and has the potential to be delivered in different formats including text, video clips, 'live' crop calendars and on-line discussion forums.

Project AV10002

For more information contact:

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Avocados and climate change

This project reviewed the potential impacts of climate change on the avocado industry, identified specific management strategies that can be employed in different production regions, and summarised key aspects of climate policies relevant to the industry.

Regional climate projections revealed that the amount of climate change and level of associated risk is likely to vary considerably among the regions. Over the next several decades, growers in some regions may encounter challenging conditions more frequently than at present, and these conditions may require adaptation strategies to be

employed. A number of management strategies were identified that should increase the industry's adaptive capacity and provide a level of resilience to climate change.

The report also includes a detailed review of a range of climate policies that may impact on the avocado industry and a series of recommendations for further research and development.

Project AV09003

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Avocado Industry Strategic Plan

The process to develop the industry's next strategic plan began in early 2010. The Avocado Industry Advisory Committee and the Avocados Australia Board wanted to develop a plan that built on the vision and direction of the 2006-2011 Plan.

The new draft plan articulates the following:

Industry Strategic Intent: Australian Avocados Everyday for a Healthy Life!

Industry Key Aspirations: The Australian avocado industry aspires to be:

- A growing, progressive, profitable and sustainable industry.
- A leader in product, supply chain and industry development innovation.

It aims to deliver to its customers:

- A consistent, good quality product.
- Innovation and choice.
- A product that is recognised and appreciated as Australian and an essential health food.

The objectives and strategies of the new plan focus on building sustainable and competitive supply; driving demand and ensuring that there are sufficient resources and appropriate structures to support industry development.

Project AV09008

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INVESTING IN AUSTRALIAN HORTICULTURE

Australian Government priorities

As part of the Australian Government's commitment to rural research and development, horticulture industries can access matching Commonwealth funding through HAL for all research and development activities.

The Australian Government's Rural Research and Development Priorities aim to foster innovation and guide R&D effort in the face of continuing economic, environmental and social change. HAL's operations are closely aligned with these priorities.

This chart shows the percentage of expenditure in HAL's avocado R&D program against each of the Australian Government priorities for rural research and development. Full details of expenditure across all industries is available in HAL's annual report at www.horticulture.com.au

The Australian Government priorities are:

Productivity and Adding Value

Improve the productivity and profitability of existing industries and support the development of viable new industries.

Supply Chain and Markets

Better understand and respond to domestic and international markets and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers.

Natural Resource Management

Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable.

Climate Variability and Climate Change

Build resilience to climate variability and adapt to and mitigate the effects of climate change.

Biosecurity

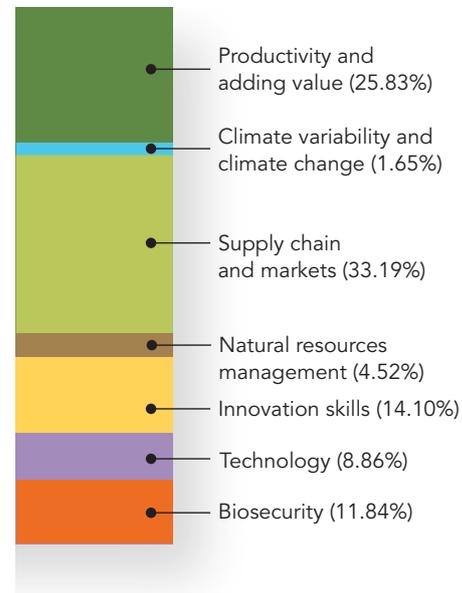
Protect Australia's community, primary industries and environment from biosecurity threats.

Innovation Skills

Improve the skills to undertake research and apply its findings.

Technology

Promote the development of new and existing technologies.



HAL'S roles and relationships

Horticulture Australia Limited (HAL) is a not-for-profit industry owned company. Its role is to manage the expenditure of funds collected by the Australian Government on behalf of horticulture industries.

In 2010/11 HAL invested more than \$90 million in projects to benefit horticulture industries.

An Industry Advisory Committee (IAC) is established for each industry with a statutory levy and annual income exceeding \$150,000.

The Industry Representative Body (IRB) for an industry is responsible for recommending to HAL the establishment of, and any changes to, statutory levies. The IRB for an industry with a statutory levy recommends membership of the IAC to HAL and must demonstrate how the skills required on an IAC are met by the persons they recommend for appointment to the committee.

For more information please visit www.horticulture.com.au

HAL partnership agreement and consultation funding

The partnership agreement between Avocados Australia and HAL sets out the tasks each organisation will perform to enable the other to discharge its responsibilities related to levy payers and industry services.

Partnership agreement activities are funded by HAL using the Avocados Australia R&D levy and matched funds from the Australian Government as well as avocado marketing funds.

These funds enable Avocados Australia to undertake the Annual Levy Payers' Meeting, conduct IAC meetings, attend HAL Industry Forums, and attend HAL / Avocados Australia Executive Board to Board consultation meetings, and other

formal and informal consultation between personnel of Avocados Australia and HAL.

The full year consultation funding expenditure for Avocados Australia in 2010/11 was \$298,237. This represents 6.6% of the total annual levy expenditure. Consultation funding in respect of R&D represents 9.1% of the investment in R&D expenditure and consultation funding in respect of marketing represents 3.4% of the investment in marketing expenditure.

Project AV10900/10

For more information contact:
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ACROSS INDUSTRY PROGRAM

The avocado industry contributes funding towards an across industry program that addresses issues affecting all of horticulture. Details of the current program are listed below. A full report of the program can be found at http://www.horticulture.com.au/industries/across_industry_program.asp

Project No.	Project title	Levy or VC	Project start	Project finish	Organisation	Contact
Objective 1: To enhance the efficiency, transparency, responsiveness and integrity of the supply chain						
AH09009	Food security discussion paper	Levy	30/07/2010	28/01/2011	Growcom	Troy Reeves 0408 135 003
Objective 2: Maximise the health benefits of horticultural products						
AH09023	Health and well-being in horticulture	Levy	1/11/2009	1/11/2010	Team Rowley Pty Ltd	Chris Rowley 02 8901 0329
Objective 3: Position horticulture to compete in a globalised environment						
AH09018	Office of Horticulture Market Access – National Director	Levy	1/04/2010	28/02/2012	Stephen Winter & Associates Pty Ltd	Stephen Winter 03 9832 0787
AH09019	Office of Horticulture Market Access – Technical (SPS and Research and Development) Manager	Levy	1/10/2009	30/09/2010	Kalang Consultants	Rob Duthie 02 6286 7151
AH09021	Office of Horticulture Market Access - Operations Support	Levy	1/09/2009	31/12/2011	Horticulture Australia Ltd	Wayne Prowse 02 8295 2318
AH09027	Investing in Youth Successful Scholarship Applicant	Levy	31/05/2010	31/03/2014	Rural Industries R&D Corporation (RIRDC)	Ken Moore 02 6271 4127
Objective 4: Achieve long term viability and sustainability for Australian horticulture						
AH09003	Plant protection: Regulatory support and co-ordination	Levy	1/07/2009	30/05/2014	AKC Consulting Pty Ltd	Kevin Bodnaruk 0408 567 252
AH10003	Horticulture component of the National Climate Change Research Strategy for Primary Industries	Levy	1/04/2011	31/08/2011	Horticulture Australia Ltd	Peter Melville 02 8295 2317
AH10006	Pesticide spray drift in horticulture - a response to new guidelines from the APVMA	Levy	1/07/2010	31/05/2011	Horticulture Australia Ltd	Peter Melville 02 8295 2317
AH10009	Response to Productivity Commission	Levy	1/10/2010	31/03/2011	Horticulture Australia Ltd	Warwick Scherf 02 8295 2323
MT08042	Driving collaboration in Australian horticultural research	Levy	1/12/2008	30/06/2011	RIS Projects	Russell Soderlund 03 5968 3599
MT09043	Enhancing confidence in product integrity in domestic and export markets	Levy	1/07/2010	30/06/2011	Horticulture Australia Ltd	Warwick Scherf 02 8295 2323
MT10029	Managing pesticide access in horticulture (cont from AH04009 and MT07029)	Levy	1/07/2010	2/07/2015	AgAware Consulting Pty Ltd	Peter Dal Santo 03 5439 5916
MT10049	A multi target approach to fruitspotting bug management	Levy	1/03/2011	1/04/2016	NSW Department of Industry and Investment	Dr Ruth Huwer 02 6626 2451
Objective 5: Other						
AH10012	Horticulture support for the CRCNPB rebid	Levy	15/09/2010	31/12/2010	CRC For National Plant Biosecurity	Scott Baxter 02 6201 5067

AVOCADO PROGRAM

Project No.	Industry obj.	Rural R&D priorities	Project title	Levy or VC	Project start	Project finish	Organisation	Contact
AV07000	1	  	Improving yield and quality in avocado through disease management	LEVY	2/07/07	30/11/10	Department of Employment, Economic Development & Innovation	Dr Elizabeth Dann 07 3255 4352
AV08000	1	   	Rootstock Improvement for the Australian Avocado Industry - Phase 3	LEVY	1/01/09	1/12/12	Sunshine Horticultural Services Pty Ltd	Dr Tony Whiley 07 5441 5441
AV08002	1	   	RNA silencing based Phytophthora root rot resistant avocado rootstocks for improved production of GM free fruit	LEVY	28/11/08	30/05/12	Department of Employment, Economic Development & Innovation	Neena Mitter 07 3346 6513
AV08018	1	 	Development of best practice guidelines for avocado ripening	VC / LEVY	26/06/09	30/09/11	Department of Employment, Economic Development & Innovation	Terrence Campbell 0427 602 007
AV08020	1	   	Evaluation of sustainable orchard management practices for extension into general industry standards to reduce costs	LEVY	30/01/09	30/11/12	Avocados Australia Limited (AAL)	Dr John Leonardi 07 3846 6566
AV08034	1	 	Avocado Retail Quality Surveys Phase II	LEVY	1/04/09	31/10/11	Avocados Australia Limited (AAL)	Antony Allen 07 3846 6566
AV08046	1	 	Real-time freight container trials to assess impact of long-term storage of Australian Avocados exported to Europe	VC	1/05/09	8/08/11	Sunfresh Marketing Co-op	Judy Prosser 07 5478 8999
AV09001	1	  	National Avocado Quality & Information Management System	LEVY	1/03/10	1/03/13	Avocados Australia Limited (AAL)	Julie Petty 07 3846 6566
AV09005	1	  	Coordination of Export Development for Australian Avocados	VC	10/03/10	30/11/11	Avoz Exports	Jennie Franceschi 0417 988 246
AV09009	1	  	International Alternate Bearing Summit: Phase One of Alternate Bearing Solutions for Growers	LEVY	1/09/10	28/02/11	Avocados Australia Limited (AAL)	Antony Allen 07 3846 6566
AV09028	1	   	Development of an avocado rapid library tray system for Hass	VC	15/04/10	30/09/11	Department of Employment, Economic Development & Innovation	Dr Danielle Le Lagadec 0429 068 716
AV09032	1	  	Avocado QA Development & Training for Thailand and South East Asia	VC	1/09/10	29/01/11	Sunfresh Marketing Co-op	Brian Prosser 0438 467 069
AV10001	1	 	Improving yield and quality in avocado through disease management, Phase 2	VC / LEVY	31/12/10	31/12/14	Department of Employment, Economic Development & Innovation	Dr Elizabeth Dann 07 3255 4352
AV10006	1	 	Avocado supply chain education materials Phase 2	LEVY	5/10/10	30/11/12	Avocados Australia Limited (AAL)	Julie Petty 07 3846 6566



Project No.	Industry obj.	Rural R&D priorities	Project title	Levy or VC	Project start	Project finish	Organisation	Contact
AV10007	1		Infocado Summit October 2010 and Extension to Industry	VC / LEVY	1/10/10	28/02/11	Avocados Australia Limited (AAL)	Courtney Vane 07 3846 6566
AV10010	1		Avocado Alternate Bearing Research	VC	21/09/10	31/05/11	The New Zealand Institute for Plant and Food Research Ltd	Dr Grant Thorp +64 9 925 7290
MT06022	1		Generation of dimethoate and fenthion residue samples to maintain market access	VC / LEVY	6/06/07	16/08/10	Agronico Research Pty Ltd	Dale Griffin 03 9775 4230
MT08013	1		Development of an International Standard for Mobile Elevating Work Platfor (MEWP's) used in Orchards	VC / LEVY	15/07/08	27/08/10	Keith Batten & Associates	Keith Batten 0418 738 969
MT08035	1		Providing data packages for new fruit fly control technology	VC / LEVY	1/07/08	25/05/12	Department of Employment, Economic Development & Innovation	Dr Hainan Gu 0401 676 360
MT08036	1		Ecology and preharvest control of fruit flies for syste approaches to market access for fruit fly host commodities	LEVY	1/07/08	30/04/12	CRC For National Plant Biosecurity	Anthony Clarke 07 3864 5023
MT09026	1		Protecting pollination for the Australian horticultural industry Stage 2	VC / LEVY	30/03/09	31/07/12	Horticulture Australia Ltd	Kim James 08 6389 1407
MT10021	1		Determination of cold tolerance in immature stages of Australian pest fruit fly species	LEVY	1/11/10	31/12/13	Department of Employment, Economic Development & Innovation	Peter Leach 07 4057 3679
MT10049	1		A multi target approach to fruitspotting bug management	LEVY	1/03/11	1/04/16	NSW Department of Industry and Investment	Dr Ruth Huwer 02 6626 2451
MT10066	1		Project Coordination for MT10049	LEVY	14/03/11	31/05/13	RCR Agri Pty Ltd	Chaseley Ross 0409 707 806
AV07023	2	N/A	Avocado Retail Price Surveys	LEVY	25/06/08	30/08/12	Avocados Australia Limited (AAL)	Julie Petty 07 3846 6566
AV09000	2		Identifying bioactive components and portion sizes in avocados for consumer health	LEVY	15/11/09	20/05/11	Applied Horticultural Research P/L	Dr Gordon Rogers 02 9527 0826
AV10005	2		Avocados in Early Childhood Initiative 2010-11, Implementation Strategy	LEVY	9/08/10	30/06/11	Woodrow Consulting Pty Ltd	Gunjan Tandan 02 8295 2376
AV10015	2		Australian Avocado Industry Strategic Plan for Health & Nutrition Research	LEVY	21/01/11	11/02/11	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376
AV10017	2		Avocado Nutrition Desktop Research and Best Minds Panel	LEVY	4/04/11	30/06/11	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376
AV10500	2	N/A	Avocado Domestic Consumer Marketing Program 2010-2011	LEVY	1/07/10	30/06/11	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376
AV10501	2	N/A	Avocado Export Marketing Program 2010-2011	LEVY	1/08/10	30/06/11	Horticulture Australia Ltd	David Chenu 02 8295 2381
AV10516	2	N/A	Foodservice Annual Marketing Plan 2010-2011	LEVY	16/07/10	30/06/11	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376

Australian Government Rural R&D Priorities:

- Productivity and adding value
 Supply chain and markets
 Natural resource management
 Climate change and climate variability
 Biosecurity
 Innovation skills
 Technology



Project No.	Industry obj.	Rural R&D priorities	Project title	Levy or VC	Project start	Project finish	Organisation	Contact
MT08060	2		Consumer Tracking Study	LEVY	1/12/08	1/12/11	Brand Story Pty Limited	Steve Sheppard 02 8399 3850
MT10017	2		Understanding the Purchase Behaviour of Fresh Produce Consumers	VC / LEVY	1/09/10	30/08/12	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376
MT10022	2		Export-Import Market Intelligence	VC / LEVY	1/09/10	31/05/12	Horticulture Australia Ltd	Ravi Hegde 02 8295 2300
MT10048	2		Education Program Targeting Fitness Professionals	LEVY	1/07/10	30/06/11	Horticulture Australia Ltd	Gunjan Tandan 02 8295 2376
AV06003	3		Study groups to achieve globally competitive avocados	LEVY	15/12/06	31/07/10	Department of Employment, Economic Development & Innovation	Simon Newett 07 5453 5800
AV07001	3		Investigation of the distribution and incidence of Avocado sunblotch viroid in Australia	LEVY	10/07/07	31/12/10	Department of Employment, Economic Development & Innovation	Dr Andrew Geering 07 3896 9353
AV08025	3		Avocado resource audit web database	LEVY	15/05/09	31/12/11	Avocados Australia Limited	Antony Allen 07 3846 6566
AV08045	3		Avocado Industry Communications Strategies	LEVY	15/05/09	1/03/11	Avocados Australia Limited	Antony Allen 07 3846 6566
AV09003	3		Climate change and climate policy implications for the Australian avocado industry	LEVY	1/12/09	31/12/10	Growcom	David Putland 07 3620 3823
AV09008	3		Avocado Industry Strategic Plan	LEVY	31/03/10	30/11/10	p2p business solutions pty ltd	Jenny Margetts 07 3311 2710
AV09029	3		Planning for the VII World Avocado Congress in 2011, Cairns Australia	VC	30/07/10	1/07/11	Avocados Australia Limited	Antony Allen 07 3846 6566
AV10002	3		Avocado best management practices and internet based information delivery	LEVY	1/11/10	31/12/13	Department of Employment, Economic Development & Innovation	Simon Newett 07 5453 5800
AV10004	3		Biosecurity capacity building for the Australian avocado industry: Laurel Wilt	LEVY	1/10/10	31/01/13	Department of Employment, Economic Development & Innovation	Dr Andrew Geering 07 3896 9353
AV10800	3		Industry Annual Report	LEVY	1/07/10	30/06/11	Horticulture Australia Ltd	Ana Reynolds 02 8295 2300
AV10900 /10	3		2010-11 Avocado Partnership Agreement	LEVY	1/07/ 10	10/08/11	Avocados Australia Limited	Antony Allen 07 3846 6566

Australian Government Rural R&D Priorities:

- Productivity and adding value
 Supply chain and markets
 Natural resource management
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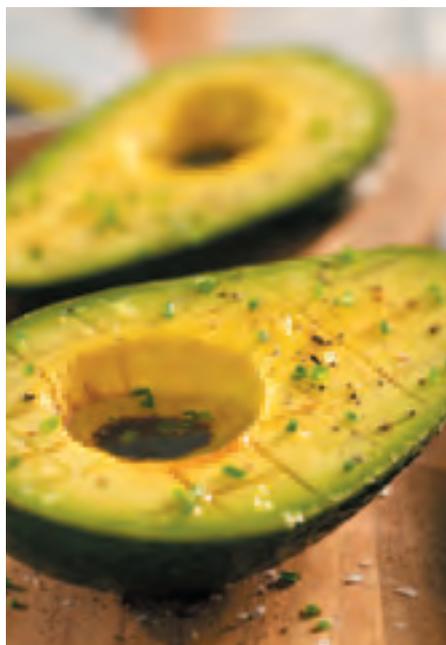
AVOCADO INVESTMENT SUMMARY

Year Ended 30 June 2011

	Marketing 2010/2011 \$	R&D 2010/2011 \$	Combined 2010/2011 \$
Funds available 1 July 2010	360,053	1,120,386	1,480,439
INCOME			
Levies Received	2,284,319	1,529,059	3,813,378
Commonwealth Contributions		1,236,508	1,236,508
Other Income	(18,859)	65,509	46,650
Total Income	2,265,460	2,831,076	5,096,536
Budget	2,234,803	3,082,687	5,317,490
Variance to Budget	30,657	(251,611)	(220,954)
PROGRAM INVESTMENT			
Levy Programs	1,692,422	2,164,653	3,857,075
Service Delivery Programs by HAL	223,305	308,362	531,667
Across Industry Funding		30,005	30,005
Levy Collection Costs	48,009	39,262	87,271
Total Investment	1,963,736	2,542,282	4,506,018
Budget	1,978,646	3,243,261	5,221,907
Variance to Budget	14,910	700,979	715,889
Annual Surplus/Deficit	301,724	288,794	590,518
Closing Balance 30 June 2011	661,777	1,409,180	2,070,957

Avocado Industry Advisory Committee (IAC)

Bob Granger (Chair)
Daryl Boardman
Russell Delroy
Lachlan Donovan
Nick Hobbs
Jim Kochi
Henry Kwaczynski
Chris Nelson
Tom Silver
John Walsh
Antony Allen (ex-officio)
John Tyas (ex-officio)



FOR MORE
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