

Horticulture Innovation Australia

Final Report

Papaya Communications

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Papaya Industry Australia

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Summary

Papaya Australia Ltd has developed over the past 3½ years 15 newsletters called the Papaya Post. These newsletters were printed and sent out to over 130 growers. The aim of these newsletters is to provide the grower with relevant information on research and marketing, industry development, technology and research.

Many of the newsletters discussion topics were:

- Breeding Projects
- Fruit Spotting Bug Project
- Papaya Mealy Bug
- Papaya Seed Supplies
- R & D
- Marketing
- Minor use permits

The Industry Annual Report was produced in conjunction with HAL as a one off report per year on the state of the R & D and Marketing projects. This Report was sent to over 130 growers.

Papaya Australia Ltd developed a new website aimed at a more user friendly website for the consumer. The website features sections on the difference of Red Papaya and Yellow Papaw, recipes, nutritional content and updated news and events.

Keywords

Papaya

Papaya Post

Newsletter

R & D

Marketing Papaya

Recipes

Nutritional

Introduction

Up until 2011/12 the development and delivery of the industry newsletter and updating of the industry website had been included in the Partnership Agreement. HAL now require industry to submit a separate project for these two communication items. Papaya Australia Ltd see the publication of the Papaya Post (newsletter) and updating of the industry website integral to successful industry communication.

The Papaya Industry wanted to provide growers with as much information on the industry as possible. With the set up of the Papaya Post, Industry was able to reach the growers with the necessary information they needed to keep updated on what was happening from fruit quality, minor use permits, updates on the latest breeding projects, research and development, marketing and much more.

Methodology

Papaya Australia contract David Hine to develop and print the Papaya Post newsletter. David is based at Mission Beach, Queensland and has had this contract for a number of years.

Sherri Soncin is the Industry Secretariat and she is responsible for updating the Industry website.

The Papaya Post and Industry Website are the key communication tools. The functions of these two publications include:

- Dissemination of industry development, technology and research news to 120 growers who are spread throughout Northern Queensland.
 - o Updates on levy funded R & D and marketing projects
 - o Information on the productivity commission findings
 - o Operations of HAL
- Examples of articles published in previous issues include:
 - o Post Harvest Treatments
 - o Reducing the impact of the wet season on fruit quality
 - o HIA marketing update

Outputs

- 15 newsletters over the past four years sent to all growers (120), industry service providers and researchers.
- Continually updating of Industry website.
- The HAL Industry Annual Report, a one off report per year on the state of the R & D and Marketing projects that the Industry does in conjunction with HAL. This report is issued to all Levy Payers.
- A Biosecurity Manual and CD, IAC Annual Report and Poster on all types of diseases were sent to all growers.

- Field days both on the Tablelands and the Coast were conducted.
- Setting up the Industry's Facebook page. The Facebook page shows great photos of the variety of Papaya, various recipes, nutritional facts and more.
- Industry conducted a survey of its growers through the Papaya Post and email addresses. The survey asked growers if they were happy with the content, the number of publications, what they want to see more of and whether they would prefer to have the Papaya Post emailed or mailed.

Outcomes

Papaya Australia's mission is to supplying Australian consumers with high-quality, delicious Papaya, all year-round, while delivering a good return on investment for growers. This is achieved through careful variety selection, professional growing practices and an efficient supply chain and targeted marketing activity. The Industry values the spirit of co-operation and sharing between growers, the benefits of activities such as R & D and marketing, its relationship with local communities and care for the environment.

Industry believes we have achieved the following:

- Helps to build a cohesive industry
- Promotes and educates the general public about the Papaya industry
- Assists in fulfilling PAL's legal obligations to keep levy payers informed about their levy program
- Assists in the adoption of industry best management practices

Industry believes that in the longer term, we will achieve better communication with growers and consumers.

Evaluation and Discussion

With Industry now in control of seed supply with the formation of Papaya Seeds Australia, Industry was able to redevelop its database. Following the redevelopment, all growers and others on the existing database were able to be contacted. This was done by mail and email. Undertaking this exercise was a very worthwhile activity, as a number of people had exited the industry or had changed contact details. This has been a major activity and the number of people we now have on our database who remain actively involved in the Papaya industry is now approximately 130.

We are now able to sought information from the growers as to production information eg. numbers, varieties etc.

Papaya Australia regularly contacts our Newsletter developer as to what is required to be inserted into the Papaya Post. The Board of Papaya Australia have looked into further advancing the Papaya Post by sending it electronically as we now have a sound database of email addresses, but still printing of those who don't have that access.

Also through the updated database, we are able to advise growers of Field Days, workshops, Strategic Planning Days, International Horticultural Convention and much more. During these Field Days showed growers the progress on breeding projects, workshops delivered information on market access, pest and disease etc.

Recommendations

Papaya Australia Ltd aim of the Papaya Post to have 4 to 6 publications per year and understand we have fallen short. That is why Papaya Australia is in the process of looking into other options; from a different contractor to go more in line with how the world is going – electronic (email newsletters). From that we would hope to achieve our target of 5-6 publications per year if not more. We aim for the website to have more information as including our newsletter on the website, having a facebook page etc.

Papaya Australia Ltd would like to see the continuation of the Papaya Post (newsletter) and Website to benefit our growers and consumers.

Appendices

1. Papaya Post 1 for 2015
2. Papaya Post 2 for 2015
3. Papaya Post 3 for 2014
4. Question 1 of Survey – Response by online survey
5. Question 2 of Survey – Response by online survey
6. Questions 3 of Survey – Response by online survey
7. Question 4 of Survey - Response by online survey

Papaya Post

*...news that's so fresh its green...
and some with a hint of colour*

The Chairman's Report



Dear Papaya Post Readers

It is now the end of March, with another quarter of a year behind us. Easter is the end this week, which begs the question of what has happened since Christmas. It has clearly been a very below average wet season in rainfall terms, even though there was a cyclone or two off the coast which kept everyone on edge. I realise that officially the wet does not finish till end April or May, however with cool nights and clear dry days, one has the feeling that not much rain will still come.

The last 3 months has seen a fairly large volume of fruit on the market with predominantly good quality. The main volume was in red papaya with yellow paw paws being generally short. The prices have reflected this volume with most red papaya selling quite cheaply yet yellows being high priced.

I have still heard comments from wholesalers that consumer confidence is not strong, as well as there being a large volume of alternative fruit available at cheap prices. April and May are traditionally very high volume supplied months, so interesting times ahead in terms of margins. The recent below average rainfall should result in

above average quality with good flavour and shelf life, resulting in good value for money for consumers.

Disease Incursions

The TR 4 Panama detection in bananas in Tully, has been well documented of late. By all accounts it is a devastating disease which has the capacity to wipe out the Bbanana industry as it is currently known. The severity and devastation which this disease caused in the Territory is cold comfort to what could occur here.

Being the little brother to the banana industry, we hope that it is contained and ideally eradicated from any plantation even though it will likely never be eradicated from the current farm. The worst news would be that it shows up on neighbouring farms or for that matter in other districts. We wish the industry all the best in this matter.

This incursion is a timely reminder of the very real threat that diseases can cause to an industry. There is a long list of diseases that have caused major problems for a number of industries and districts such as papaya fruit fly, citrus canker, fire ants, varroa mite in bees etc.

I have many times written of the very real threat that diseases pose to our industry. The main threats on the horizon are bacterial crown rot, delarmeria and ring spot virus. These diseases occur in many countries and growing areas throughout the world and have

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Briefly

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- 5 Report on Thailand, Papaya/Papaw IDO
- 7 HIA Considers New Models of Funding Research
- 11 Marketing Update from HIA

caused a very significant problem to producers. In some cases it has become totally unviable to grow papaya.

We must continually be very vigilant in regards to preventing any new disease entering Australia.

The biggest transmission threat will be via seed, fruit and plant importation from abroad. Seed is probably the easiest transmission source, given that small amounts can be sent via mail.

Papaya Australia has for a long time now alerted Biosecurity Australia, as to the disease presence and the lack of restrictions for seeds from known source areas. Special mention must go to QDPI staff, in particularly Lynton Vawdrey. Remaining disease free, will ultimately come down to the correct efforts of everyone along with a bit of luck. Time will ultimately tell.

I hope that times ahead remain reasonably buoyant for producers and that we as an industry continue to grow at a steady rate. Until next issue I hope you enjoyed Easter, and good returns.

Regards
Gerard Kath



Background Information on Panama Disease of Bananas

The Chairman mentions the discovery of the very serious disease of bananas, Panama disease. This is a fungal disease that causes the water and nutrient system that runs up through the leaves to collapse. All the leaves of a banana are attached to the base of the plant near the ground. When the stem of the plant is cut rusty red sections can be seen where the disease is causing the collapse of the vascular bundles.



On assessing the extent of the problem, and the state of knowledge of management techniques to minimise the spread. This includes several researchers who usually contribute to the Papaya Post. We wish them well in their work and look forward to future contributions on papaya.

Below is some information from the Food and Agriculture Organisation of the UN.

'Bananas are vulnerable to a number of diseases in various parts of the world, including the Black Sigatoka disease, Xanthomonas wilt (BXW), Bunchy Top Disease (BBTD) and Fusarium wilt. Among these, Fusarium wilt has been the most

difficult to control due to its soil-borne nature. The resting spores of the fungus survive in the soil for decades and preclude the return of susceptible bananas, and management options have not been adequately effective. The disease was effectively controlled by the Cavendish varieties which have been resistant to races 1 and 2 of the fungus for decades.

However the occurrence of TR4 has significantly changed the situation, as Cavendish and many other varieties are highly susceptible to this race.

In brief, Fusarium wilt TR4 has the following profile:

- There is no viable, fully effective treatment of soil to control Fusarium wilt in the field.
- The fungus' resting spores remain viable in the soil for decades.
- There are no adapted resistant varieties that can replace the favored Cavendish bananas.

- Further research is needed to fully understand the biology, genetics and epidemiology of the fungus, and to identify resistant varieties.
- Prevention and quarantine measures are presently the best way to stop the dissemination of the fungus by way of infested soil and infected plant materials to TR4-free areas.'

Since the banana is so popular, and is a critical source of food in developing countries, there is a significant research effort into it. See

<http://panamadisease.org/en/about>



Panama disease strikes again

Since the 1990s a new strain of the Panama disease fungus was discovered in Southeast Asia. Since then, thousands of hectares of Cavendish plantations have been wiped out in China, Indonesia, Malaysia and the Philippines. Dissemination of the new strain to Africa and South America seems to be just a matter of time. This photo shows a farmer with a banana plant affected by Panama disease in Brazil.

New Food and Grocery Code of Conduct

About a month ago, the federal government released a new code of conduct for the food and grocery industry, to manage commercial relationships between growers and suppliers on the one hand, and wholesalers and retailers on the other.

Among the attributes of the Code, growers will note that participation is voluntary, that the ACCC is responsible for enforcing the Code and that it does not replace those parts of the Competition and Consumer Act 2010 in regards to misleading conduct and misuse of market power.

The Code and contacts about the Code can be found at:
<http://www.accc.gov.au/business/industry-codes/food-and-grocery-code-of-conduct>

Below are some extracts from these pages of the ACCC's website

The Code

The Code governs certain conduct by grocery retailers and wholesalers in their dealings with suppliers. It has rules relating to grocery supply agreements, payments, termination of agreements, dispute resolution and a range of other matters.

It is a voluntary code. This means that it only applies to retailers or wholesalers that have elected to be bound by the Code by giving written notice to the ACCC. The ACCC is responsible for enforcing the Code.

The Code provides for an additional framework for dealings between retailers or wholesalers and suppliers. The Code does not override the existing provisions of the Competition and Consumer Act 2010 and the Australian Consumer Law. In particular, the provisions

relating to unconscionable conduct, misleading or deceptive conduct and misuse of market power continue to apply.

For the purposes of the Code:

- a retailer is a corporation that carries on a supermarket business
- a wholesaler is a corporation that purchases groceries from suppliers to resupply to a supermarket
- a supplier is someone who is carrying on (or seeking to carry on) a business of supplying groceries for retail sale by another person (including another business).

Where the conduct of a party bound by the Code is also subject to the Horticulture Code of Conduct or the Franchising Code of Conduct, the terms of this Code won't apply to the extent that they conflict with the other codes. Retailers and wholesalers must make the contact details of their Code compliance manager available to suppliers.

Protections for suppliers

The Code requires certain standards of conduct that cover the life cycle of the relationship between retailers or wholesalers and suppliers.

The Code:

- sets out minimum obligations for retailers and wholesalers relating to the making of grocery supply agreements
- requires retailers and wholesalers to act lawfully and in good faith
- prohibits retailers from threatening suppliers with business disruption or termination without reasonable grounds
- establishes minimum standards of conduct by a retailer when dealing with suppliers, such as payment, de-listing, standards

and specifications for fresh produce, and the allocation of shelf space

- requires retailers and wholesalers to provide annual training to employees whose role includes direct involvement in buying grocery products, and their managers, on the requirements of the Code.

Dispute resolution options

The Code also sets out a dispute resolution mechanism. Under the Code, a supplier can choose the dispute resolution option that meets their needs. A supplier can:

- raise the complaint with a retailer or wholesaler's Code compliance manager
 - request the immediate elevation of the complaint to senior management, or
 - take the complaint directly to mediation or arbitration.
- Where a supplier raises a complaint or dispute, they must provide, or be able to provide sufficient detail of:
- the conduct that is the subject of the complaint
 - the provisions of the Code alleged to have been breached, and
 - the remedy they are seeking.

The Code states that delisting as punishment for a complaint, concern or dispute raised by a supplier is unacceptable.



Pictures from Proong's farm.

Left: The common papaya plantation in Thailand. Chat (me) on a 'bridge' crossing to see some papaya trees.

Right: White cloth wrapping around fruits to protect skin from sunburn. The lady in yellow T-shirt, Tam, is the wife of the grower Proong. He is the man with wide hat standing behind her.



Picture from Farm Kehakarnkaset: Left: papaya trees are trained to grow leaning toward the ground to shorten the height of the tree for ease of harvest.

Report from the IDO: Papaya in Thailand

I recently went back to Thailand to visit my family and attend a wedding, but I just could not help myself and visited some papaya farms there as part of my holiday. So, at the end of journey, I ended up visiting two farms, attending a meeting of a papaya breeding project in Thailand, and presenting about the production system of papaya in Australia.

And there was a phone discussion to a grower/researcher about, of course, papaya and a visit to a university to observe their seed production system. Some of these activities were planned before I went there but some just happened by chance.

I would like to share with you here about the production system and problem of production of papaya in Thailand.

Most of papaya growers in Thailand grow papaya in a small scale, with a growing area of 4 acres for a big farm. They usually integrate papaya with other crops, such as palm, banana, sugarcane and coconut.

Only red papaya with the hermaphrodite fruit shape (long fruit) is sold in the market, so all the female trees must be discarded from the farm. That is probably why I had not seen any round papaya fruit until I came to Australia. The farming system is still, as I call it, a backyard-farming system.

The first farm, Proong's Farm in Nakhon Chai Si, is very well known in terms of flavour and uniformity of his fruit. He claims that he can sell the fruit for the fixed price of 35 Baht/kg (approximately AU\$1.50 per kilo) all year round. The price in the market can be as low as AU\$0.40 per kilo. His price does not fluctuate with the price in the market. The main cultivar in this

farm is Khaeg Dum, which is the traditional Thai red papaya with a long fruit shape. Apparently, there are more than 40 different lines of Khaeg Dum in Thailand, but Proong markets his Khaeg Dum as the best one. Why is that? Because, he has been doing breeding work with his genetic material by selection of superior trees. He is continually crossing and selecting for the best one. He also produces seeds for sale. His seed again seem to be the most expensive one in the market with the price of 1 Baht/seed (approximately 4 cents/seed). This is the proof to me that you can get a superior price, if you can do things far superior to the others.

The second farm (Kehakarnkaset) belongs to Prame Na Songkla. It is in Pathum Thani which is approximately 90 km east of the first farm. The owner of the farm is also the owner and the editor of one of the leading magazines in agriculture in Thailand.

The difference between this farm and Proong's farm is some papaya trees are planted in a net at this farm. The main reason is to protect against aphids, which are transmitter of the ringspot virus in papaya. The net seems to be able to protect the trees from aphids but the evidence of ringspot virus is still presented.

The cultivar grown at this farm is Holland. This cultivar is also known as Plak Mai Lai in Thailand and it is believed to be the same as Sekaki in Malaysia and Red Maradol in Mexico. At the present, Holland is the most popular cultivar with consumers in Thailand.

The crucial problem for the production in Thailand is the papaya ringspot virus infection. This is the main reason why they can not grow a bigger size of plantation is that

the disease will infect the trees in no time. To control the spread of the disease, the infected plant must be destroyed immediately. GMO is also another big issue for papaya production in Thailand. Low numbers of fruit set in summer, which is due to conversion of sex of flowers, can affect the production of papaya in the hot season and the consequences are reflected in price in the market.

The presentation about my visit to Thailand especially in relation to papaya farm visits will be presented in more detail in one of the grower meetings. Please leave me your contact details if you would like to be notified so you can attend the event. Just to inform you regarding my IDO work that I will be visiting farms in Innisfail and Tully again in April 2015. So, if you would like a visit, as I would love to visit you!, please leave me your contact details. Hope to see you soon.

By Chat Kanchana-udomkan
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Picture of Holland papaya from farm Kehakarnkaset

**Figure1: Key Opportunities and Challenges
for the Australian Horticulture Industry**

Opportunities	<ul style="list-style-type: none"> • Information and intelligence to provide better solutions for an evolving market, and better meet consumer demands • Market access strategies and identification of growth markers • R&D to improve and develop value and supply chains • Market intelligence and novel product development (ie urban greening) • Approaches towards information capture, management and dissemination 	<ul style="list-style-type: none"> • Robotics and mechanisation • Uniform plant architecture • Advanced processes and systems • Leadership, skills and succession planning • Better data access and storage techniques • Value chain and supply chain research • Strategies for organisational structures, scale and business performance 	<ul style="list-style-type: none"> • Reduced dependency on labour and costly inputs • Understanding impact on natural resources • Sustainable production practices and technologies (protected cropping) • Varieties and practices to reduce reliance on water and/or soils, provide higher yields • Pest and disease practices, technologies, genomics and physical protection • Resistance to and protection from sun damage and drought
Challenges	<ul style="list-style-type: none"> • Consumer trends • Scale and bargaining power • Supply chain integration • Novel products and target markets 	<ul style="list-style-type: none"> • Reliance on labour • Review of farm practices • Information capture, management and dissemination • Scale and value-chain logistics • Leadership and succession planning 	<ul style="list-style-type: none"> • Water availability and management • Biosecurity • Climate variability • Land and soil • Energy costs • sustainability

HIA Consultation on R&D Funding

Editor's Note

HIA began circulating a consultative green paper on 27 Feb of this year. The text below is extracted from it. Growers can download the full paper if they wish, from http://www.consultingis.com.au/our-services/strategic-business-planning/hia_green_paper

Executive Summary

Australia's horticulture industry comprises fruit, vegetables, nuts, flowers, and turf and nursery products. The industry is important to the Australian economy – being the nation's third largest agricultural industry.

Horticulture Australia Limited (HAL) was created in 2001 to conduct R&D investments on behalf of Levy Payers in the Australian horticulture industry. The model of HAL was appropriate for the time and circumstances. However, the horticulture industry has grown and changed in nature significantly since 2001 with increasing competition from international growers, structural changes as well as environmental and natural challenges such as climate change.

Horticulture Innovation Australia Ltd (HIA)

The evolving horticulture industry has seen a new structure of HIA created, moving to a grower-owned model. Following a transition period, which will conclude in or before November 2015, HIA will become an industry owned Rural Research and Development Corporation in which Levy Payers are voting members.

HIA also proposes that new structures and approaches are required so that R&D investments can capitalise on the opportunities for growth, and overcome the challenges facing the horticulture industry, today and into the future.

The Strategic Co-Investment Fund Pool (SCIFP)

The new HIA structure allows for the creation of the SCIFP which is able to pool seed funds, create a single strategic plan and a clear set of strategic R&D investment priorities that are attractive to other co-investors. The pooling of these funds is intended to allow for longer-term investments in large key strategic projects that are needed to overcome the challenges facing the industry. Such investments often have the potential to impact the industry as a whole and encourage participation from specialist research providers. It is hoped that this will realise a healthier and stronger industry in the long term.

Challenges and opportunities facing the Horticulture Industry

Achieving growth for the industry will require innovation, coordination and commitment and the identification of strategic R&D investment priorities that have the potential to substantially benefit the broader industry in the longer term.

See Figure 1 Key Opportunities and Challenges for the Australian Horticulture Industry, opposite

Consumers and markets

A number of changes have been facing the horticulture industry in recent times, including a growing population and middle class as well as globalisation of horticulture markets. This presents an opportunity for the Australian horticulture industry to capitalise on new and growing markets – domestically and internationally.

Australian horticulture has a number of advantages to capitalise on new market opportunities, such as a diversity of growing regions, a reputation for quality and safe products and proximity to

developing markets like Asia. To be more competitive on a domestic and international platform, the industry will need to develop a better understanding of changing consumer needs, build scale to gain bargaining power with the retailers like supermarkets, consider supply chain integration where possible, and compete on premium attributes. R&D will play an important and increasing role in these opportunities.

Farm productivity

Innovations that can result in increases in yield, economies of scale, and lower unit costs represent significant opportunities for the Australian horticulture industry. Evidence has shown that productivity improvements have contributed significantly to the prosperity of the horticulture industry in Australia's past, but that productivity growth has declined in recent times. In addition, developing nations such as China are now outperforming Australia's productivity growth. This, combined with lower labour and other input costs puts significant pressure on Australian farmers to improve their productivity.

To be more competitive on a domestic and international platform, the industry will need to develop better farm production methods. To improve productivity, the industry will need to invest in R&D. Priority areas will include robotics and mechanisation, advanced processes and systems, and strategies for organisational structures, scale and business achievements.

Resource Use

There are some major constraints to the industry's ability to meet the growing market demand and desired productivity improvements ...

(continued on pg 8)

HIA Consultation on R&D Funding continued

– for example, water supply, soil health and degradation, climate variability, and emerging pests and diseases.

Therefore, R&D investments need to focus on developing capabilities to reduce the industry's reliance on certain natural resources and to cope with challenges such as climate change and pests and diseases.

Research could therefore be directed at, for example, advanced sustainable production practices (e.g. protected cropping, reduced input use) and crop varieties (e.g. higher yields, diseases and pest resistance).

Consultation on the Strategic R&D Investment Priorities

The creation of the SCIFP represents a significant opportunity for HIA to invest in larger, longer-term R&D priorities for the broader benefit of the horticulture industry. In order to identify the key strategic

R&D investments within the SCIFP, an analysis of the challenges and opportunities facing the horticulture industry is required.

The new structure for HIA has seen the creation of a Strategic Co-Investment Funding Pool (SCIFP) which will see around \$20 million p.a. of seed funds allocated for strategic R&D investments for the horticulture industry.

The SCIFP investment fund will be used to support research that will address major challenges facing the horticulture industry, which are normally out of the scope of levy co-investment. The attributes of these investments are likely to be large cross-industry investments with a higher risk profile or longer return on investment. These research areas are also likely to attract additional public or private funding or co-investment.

Although the establishment and

operation of the SCIFP has been endorsed by the HIA board, feedback and consultation with HIA members and horticulture sector stakeholders is needed to guide and enhance the decision making about the fields of research that will populate the SCIFP. To seek this input, HIA has developed this Consultation Paper that explains:

- the context of establishing the SCIFP and its alignment with the broader establishment of HIA;
- the key opportunities and challenges impacting on the horticulture sector;
- the key criteria that will be applied to assess the potential strategic investment priorities for the SCIFP; and
- a road map for the next steps in terms of how this consultation will operate and the strategic investment priorities will be determined.

3D Printing of Food

3D printing is gathering a lot of attention. It is finding uses in industries as diverse as from supplying parts for the maintenance of jets, to building construction and from electronics boards to food. It is thought in some quarters that 3D printing will enable manufacturing to return to regions where manufacturing facilities got out of date and closed a spiral of lost jobs and declining opportunities. China might not be the factory of the world in the near future, as a new industrial revolution allows us to make parts on demand locally.

There are several different technologies which we group together as 3D printing. It is worth noting however that many people

prefer the term additive printing since it describes the common feature of most of the technologies: that they lay down successive layers of a material to build the object. Each technology does it somewhat differently. Whether it is sintered metal or a layer of concrete, the strips of thin metal that make the connections in electronics boards, or strange lattices made in chocolate, they are most often put down in layers.

What makes it unique and useful can be demonstrated by an example from hydraulic engineering. Suppose we have a block of block of metal and two tracks of hydraulic fluid flow through it. Both exit on the left

side, but the first enters at the top, then makes a 90 degree turn to the left. The other enters at the bottom and also makes a 90 degree turn. To create the block and the tracks, a machinist might drill the two tracks from the left side, then drill in from top and bottom to intersect with the two different tracks. The sharp 90 degree turns cause restrictions in the flow. With additive printing the tracks can be created with a gentler bend, minimising the impact on the hydraulic pressure. It may be possible to build a valve inside the channel while the block of metal is printed.

It is this concept of building up by layers in order to create internal

3D Printing of Food continued

structures that are not possible with casting or machining that inspires the innovators.



In food, your Editor currently thinks that the interest in intricate structures made of food and to be eaten may be interesting on special occasions. I don't see an ongoing need or benefit for everyday life.

It's worth looking at the products of 3D printing of chocolate, if you are a fan of the flavour. Hershey is one of the players in the 3D chocolate zone.



More interesting than these structures is the capacity to put down layers or columns of food materials to make new kinds of food.

We have been hearing about the laboratory food for decades, since the space race brought it to our imagination. Now that dream is about to land in kitchens around the world.

A Barcelona company, Natural Machines, has developed a 3D food printer that can use several sources and make foods from savoury to sweet. The printer will make foods that are repetitive tasks such as

filling and forming individual ravioli.

Its useful to contrast smoothies and juice drinks from what additive print can offer. Instead of mixing all the flavours into one, additive food printing can keep the flavours separate. So we could see layers of carrot paste and a thin layer of thyme paste, printed in a gelatine mould cup. Like sushi with some wasabi. There have even been suggestions that food could be printed with a nutritional makeup suited to the health status of the individual. The idea is clearer when you think of the needs of diabetics, but many people might take up the idea.

And Foodini wants to put food printing machines on the kitchen benches of the world. At around \$1300 it may not be immediate, but it is likely to start appearing soon.

The opportunity here is to utilise marked fruit to produce the raw materials that the printer uses. Research needs to be done to identify the compositions of fruit that print well. Might we print papaya then a thin layer of coconut, then mango, then another thin layer of coconut and so on in a stack? Or

a pattern of squares in different fruits. Perhaps children will be more interested in this than we imagine.

Below is an image of 3D printed fish and chips. It would be easy to miss the chips in it. They form the hexagons containing the fish and the condiments.



We are at an early stage of development of a new, entertaining and possibly beneficial way of creating food. This may join the other hardware in the kitchen, replacing the stove as a way to prepare food.



the Foodini, from Natural Machines, Barcelona.
<http://www.naturalmachines.com/>

Marketing Update from HIA
continued



AUSTRALIAN PAPAYA AND PAPA W INSPIRED GOODNESS

 <h2>HOW TO CHOOSE</h2> <p>PAPAYA: Ripe = yellow skin & bright orange/red flesh</p> <hr/> <p>PAPAW: Ripe = yellow/orange skin & bright yellow/orange flesh</p> <div> <p>RIPE CHECK? Skin gives to gentle pressure near the stem. Enjoy within two days.</p> </div>	<p>DISTINCT YELLOW FLESH LARGER AND ROUND LESS SWEET FLAVOUR</p>  <p>YELLOW PAPA W</p>	 <p>AVAILABLE ALL YEAR ROUND PEAK SUPPLY SPRING & AUTUMN</p>  <div> <p>SERVING INFO A SERVE OF PAPAYA 150g 1 CUP DICED</p> </div>
<h2>HOW TO STORE</h2>  <p>RIPEN IN THE FRUIT BOWL, THEN STORE IN THE FRIDGE</p> <p>SPEED UP RIPENING: PLACE IN A PAPER BAG WITH A BANANA</p> 	<h2>RECOMMENDED</h2> <p>Contains folate to support a healthy pregnancy</p> 	 <p>TOP TIP Squeeze FRESH Lime OR Lemon FOR A Zesty twist</p> <p>DELICIOUS AND HEALTHY SNACK</p>  <p>VERSATILE - Add to sweet or savoury dishes</p>
<p>3X more fibre than a cup of brown rice</p> 	<p>LOW IN ENERGY & FAT</p>	<p>ASSISTS WITH</p> <p>immunity SKIN</p> <p>HYDRATION AND Digestive WELLBEING</p> <div>   </div>

www.australianpapaya.com.au

 papayaaustralia

Marketing Update from HIA

Australian Papaya Facebook Page

Launched in September 2014, the Australian Papaya Facebook page has already attracted a community of more than 1,900 people.

The page is just one element of the 2014/2015 papaya/papaw 'Inspired Goodness' marketing campaign, which aims to drive intentional purchase by educating Australians on the health benefits of papaya/papaw.

The page is 79% female, placing it well above the average proportion of 46%. The highest proportion of fans are aged 25-34% (21%) which is fantastic as our target market is

small scale families.

This year alone we have reached over 65,000 people.

Our average post engagement rate of 11% is well above the Australian brand Facebook average of 0.39%.

Our best performing post in the last month achieved 19% engagement and spoke about the differences of each fruit. The image at the right shows that post.

During the autumn flush we will be sharing the infographic on the upper part of the page opposite, to provide fans with facts and tips.

Please get involved and like us @australianpapaya



Sydney Royal Easter Show 2015 Sampling and Education



The Sydney Royal Easter Show runs from March 26th – April 8th. Over 400,000 consumers visit The Food Farm during the fourteen days of the show.

This year we have a joint stand between the pineapple, persimmon

and papaya industries to give out samples of these three fruits.

As cooperative project, it is also a cost effective way to educate small scale families, our target market, on papaya. If it's a success we will look to continue it in subsequent years and look to participate in other

events such as the Melbourne Show.

For further information please contact Elisa King Horticulture Innovation Australia 0403 378888 or elisa.king@horticulture.com.au



Food Safety Overview

In recent months, there have been several food poisoning events in the news. Food poisoning can disrupt work or travel, and can be fatal. Global statistics on reported food safety incidents are collected by a US organisation, Food SENTRY. Interestingly no country inspects more than 50 percent of food that it imports, and most inspect far less. For example, the United States inspects less than 2 percent of all food that is imported into the country, out of approximately 25 million shipments per year.

According to the data, the countries that were the top ten sources of

violative products in 2013 were (in order of frequency): India, China, Mexico, France, United States, Vietnam, Brazil, Dominican Republic, Turkey, and Spain. Each of these countries is a substantial food exporter and it is likely that their products are tested more frequently than other countries, which has some role in putting them into the Top-10 list. The products in these reports had a wide range of issues. In 2013, the most common problem was, again, excessive or illegal pesticide contamination, which made up over a third of all incidents. See more at <http://www.foodsentry.org/analysis>

-international-food-safety-violations-2013/

None the less, the more immediately serious incidents are not pesticide contamination but biological contamination. Australian data suggests that one Australian in five will experience food poisoning each year, from biological sources eg salmonella, or listeria. See more at

<http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-foodborne-illness-aust>
<http://www.fda.gov/downloads/Food/FoodborneIllnessContaminants/UCM297627.pdf>

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This project is facilitated by Horticulture Australia Limited (HAL) in partnership with Papaya Australia Ltd and is funded by the papaya levy.

The Australian Government provides matching funding for all HAL's R&D activities.

Papaya Australia Ltd

your industry body



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Papaya Post

*...news that's so fresh its green...
and some with a hint of colour*

The Chairman's Report



Dear Papaya Post Readers,
By the time most of you read this article, it will already be end June, which means half the year has gone. The wet is well and truly behind us and winter is here, albeit not very cold yet. (10th June).

I have mentioned many times before the impact that weather has on our production. Times with well below average rain fall and mild to above average winter temperatures, create the ideal conditions for record crop volume, and should result in the best fruit quality. As well, tree numbers would be at maximum, since there would be minimal tree losses. Fruit production per tree should be at a peak.

These are the circumstances we have and, and they form the main reason for the record supply and prices being at very low levels. In the first three months of the year, red lines were very heavily supplied with low prices, while yellows were short with high prices. The last three months has seen the reverse. Yellow lines have been strongly supplied with very low prices and reds having been well supplied yet with better prices than yellows.

I would suggest that as an average, it is the first time in approximately

nine years where the supply has been greater than demand over a three month period. If you are a grower who is struggling to make positive margins, then rest assured there are plenty in the same boat.

It is fair to say that there are always growers who make money and those who lose money, irrespective of season and prices. None the less, of late the number making positive headway would be a smaller percentage of growers compared to average times.

During this period it is vitally important to focus on growing the market by force with good quality product and to maximise promotions. We hope that with colder growing conditions around the corner, it should have a slowing down effect on production, thereby bringing it more in balance with demand. This will lead to an increase in prices across the board, I hope.

In the last issue of Papaya Post, we had a small survey regarding the content and relevance of Papaya Post. We were pleased with the feedback, having received 19 entries. We thank those who responded and will look to implement some of the wishes. These will include collating transport / production figures, analysis on market prices and more reports on research projects. If this jolts your thoughts and didn't get around to it last time you might still be able to go to survey monkey or send an email to admin@australianpapaya.com.au

Edition 2, June 2015

Briefly

3 Report from the IDO

5 HIA Marketing Update

7 HIA Transformation Update

and leave comments or suggestions.

HIA / HAL

Most of you should by now be aware that Horticulture Innovation Australia (HIA) is now the new horticultural governing body replacing HAL. Change is a certainty in life. For many growers I can hear you say 'So what?', or 'How will this affect me?', or 'Are they going to help me?'

There was a road show / (between the rows) meeting, with any interested growers in Mareeba last month, along with many other venues across Australia. The delegation was represented by the Board chair, CEO, R&D and Marketing managers and other senior staff. The grower turnout was not great at approximately 30, yet there was a good representation from a broad range of industries from a number of regions. There was a good session of questions and statements from the floor, dissecting the reason for change and the direction where

the horticulture industry is heading.

I would like to thank the HIA team for coming to Mareeba and look forward to how things will pan out in the years ahead. I believe it was a good learning and feedback exercise for HIA and believe that positive outcomes are more likely to eventuate. You rightly might still ask the same questions as above. I can't now answer these for you, other than to say watch this space.

The bottom line is that levies are still being collected. R&D expenditure will still be matched dollar for dollar by the federal Government, and marketing will still be done. The major unknown at this stage is who and when will decisions be made about this

expenditure. The IAC meetings have been all cancelled and HIA will be consulting with industry about priorities for investment. The Board of Papaya Australia has written a letter to HIA asking for and recommending a way forward that will fit in with the new guidelines that have been given by DAFF in Canberra.

This means that there is some uncertainty around the future communications to industry, namely this Papaya Post. I am sure that if most in industry have a desire to get this type of news letter, then some way will be found to fund and produce it. The current funding project for the Papaya Post will end at end this month, so I had better finish this so that our editor can get it printed and sent and get paid

before the money dries up.

If this is to be the last Post, then I say thank you and best wishes for the future. I will always fight for the betterment of this industry as it has been so wonderful to me and my family for the best part of 37 years. I was 11 or 12 years old when my father first planted paw paws in Gympie many moons ago. The size and the way we grow, harvest and market fruit now days is so different to those early years, that it just goes to show that change is a certainty in life.

Lets hope that the future remains bright.

Best Regards

Gerard Kath

Mountain Papaya Virus Resistant

The mountain papaya (*Carica candamarcensis* Hook. f.), is native to Andean regions from Venezuela to Chile at altitudes between 1,800-3,000 m.

The plant is stout and tall but bears a small, yellow, conical, 5-angled fruit of sweet flavour. It is cultivated in climates too cold for the papaya, including northern Chile where it thrives mainly in and around the towns of Coquimbo and La Serena at near-sea-level.

The fruit is borne all year. It is too rich in papain for eating raw but is

popular cooked, and is canned for domestic consumption and for export.

The plant grows on mountains in Ceylon and South India; it does well at 550 m in Puerto Rico.

Its high resistance to papaya viruses is of great interest to plant breeders there and elsewhere.



Image 3: Typical leaf size for sex determination

IDO Report continued

If you have any questions please feel free to contact me.

Chat Kanchana-udomkan
email: chat.kanchana@gmail.com
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The IDO is funded through the 'Industry Development and Research in the Papaya Industry' project.

This project is funded by Horticulture Innovation Australia Limited using the papaya levy, co-investment from Lecker Farming and funds from the Australian Government.

Report from the IDO: Papaya Seedling Sex Determination Using DNA Markers

As we all know, the fruit shape of papaya is related to the sex of papaya trees. The preferences in our domestic market are female fruits for yellow papaw, and hermaphrodite fruits for red papaya.

As a result, growers have to grow multiple seedlings in each planting site to achieve the maximum number of the desirable sex of trees per plantation. This means more seedlings have to be planted than are kept, more labour invested just to cull the unwanted trees and worst of all, roots of old stumps can be source of infection for root diseases. One simple conclusion is this that this costs more money for growers.

What if we could select the sex of the tree at the seedling stage and only the desirable sexes are planted? Thanks to DNA technology, I have demonstrated that it is possible now.

Advances in the study of papaya genetics is providing us a map of its genome, and the research about sex of papaya is very well documented. As part of my work as a researcher, I would like to apply the concept of DNA markers to assisting farm management as I have described and would like to see the research be applied in the real world.

Therefore, I investigated in published journals and searched for DNA markers linked to the sex of papaya. Known sex (female, male and hermaphrodite trees) were tested with multiple PCRs to find out which reactions work most reliably with our Australian papaya's genetic makeup.

PCR (Polymerase Chain Reaction) is a technique to amplify a specific piece of DNA in the area of interest. In our case, this is the sex allele.

An allele is a location of a gene on the DNA. The reaction is done using the repetition of heating and cooling temperatures on a thermal cycler, known as PCR machine.

From the preliminary experiment I performed, the marker can correctly identify female and male/hermaphrodite trees with an accuracy of 100% using 100 trees of known sexes.

true leaf and the result can be achieved within a day (300 samples per day). More research is needed for a development of a suitable method for farm application. Hopefully this technique will aid farm management in the near future.

In Image 2, you can see the size of seedlings from which sample leaves could be taken.

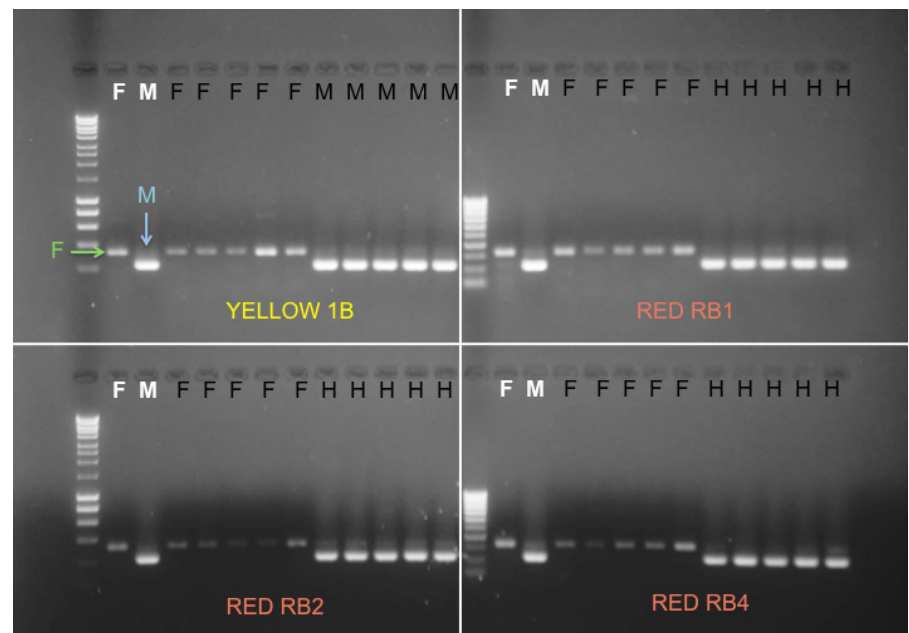


Image 1: Four examples of sex detection from four seedling lines

The reactions that distinguish between female and male/hermaphrodite were then applied to seedlings from the breeding project. Their sex was unknown. Over 2,000 seedlings were tested and the tested plants were distributed to four farms in Innisfail, one farm in Tully and two farms on the Tableland. The accuracy of the marker to detect sex of papaya will be evaluated from the sex of these unknown seedlings as it becomes clear.

At this stage, the simplest method to apply this technique is by sowing only one seed per pot and send the leaf samples for sex determination. The sex of the seedling can be detected as soon as it produces a



Image 2: Seedling size at sex testing

HIA Marketing Update

Papaya and Chicken Curry

May 10, 2015 By hotspiced • 16 Comments

Papaya are available throughout the year however there is a peak supply in Spring and Autumn. So it's definitely papaya season and I've been thinking of ways to enjoy this fruit other than chopped up on top of a bowl of muesli.



Papaya and Chicken Curry

And there's nothing wrong with papaya on muesli because the fruit has a lot of health benefits. A serve of papaya has more fibre than half a cup of brown rice. Papaya also has lots of antioxidants to boost your immune system and are high in Vitamin C. If you're weight-conscious, papaya are low in fat and energy.



Can be whipped up in less than half an hour

And for those with food allergies/sensitivities, this curry is gluten-free and dairy-free.

Papaya and Chicken Curry

Author: Papaya Australia
Recipe type: Curry Cuisine: Indian/Australian
Prep time: 10 mins Cook time: 20 mins Total time: 30 mins
Serves: Serves 4

A tasty and healthy curry that requires just a handful of ingredients and can be made in less than half an hour.

Ingredients

- 1 tbsp olive oil
- 1/2 cup korma curry paste
- 500g papaya, peeled, de-seeded and mashed (about 1 medium papaya)
- 400ml coconut milk
- 2 chicken breasts, thinly sliced
- 1 red capsicum, sliced
- Handful of Kaffir lime leaves, finely sliced
- Basmati rice to serve

Instructions

1. Heat oil in a large, heavy-based pan. Add curry paste and stir until fragrant.
2. Add papaya and coconut milk and bring to the boil. Cover with a lid and allow to simmer.
3. Add chicken and cook until chicken is cooked through.
4. Add capsicum and cook for another 2 minutes.
5. Serve curry with basmati rice and garnish with lime leaves.

The mashed papaya gives a lovely colour and flavour to the curry.



Everything you need to make a quick and easy curry

Papaya are best stored in the fruit bowl but are fragile and a few blemish marks are completely normal. Once ripe, the fruit should be eaten within two days. If under-ripe, place in a paper bag with a banana to speed up the process. The taste of a papaya is always better if enjoyed at room temperature.



Just 7 ingredients

The good people at Papaya Australia sent me a gift basket containing everything you need to make a papaya and chicken curry. I made the curry a few weeks ago and it was one of the quickest and easiest curries I have ever made that was also abundant with flavour.

isentia



New Idea, National
01 Jun 2015, by None
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HIA Marketing Update

The marketing media coverage associated with the autumn flush of papaya/papaw has generated 63 individual clips, with a reach of 2,529,958 hungry consumers.

Following the distribution of an autumn season release, coverage highlights include New Idea, Sydney Morning Herald and 26 regional and suburban newspapers. This included a syndicated story across the Sydney suburban newspaper network which includes the Manly Daily, Central Times and the Wentworth Courier.

An infographic which captures the

key messages, was sent to high profile dietitians and relevant contacts. They then shared the infographic on their own social media channels. Key influencers who shared the infographic include dietitians Karen Kingham and Nicole Senior, and Thomas Dux Grocer.

In addition, two high profile bloggers were also sent a beautiful hamper containing the ingredients to make the papaya curry developed by dietitian and Australian Papaya ambassador, Caitlin Reid. Both of these bloggers posted about the hamper on their social media channels, and posted

separate blogs about the recipe, that included the key messages that we had developed.

Overall this season we have achieved 100 pieces of coverage reaching 7,266,493 people.

For more information please contact Elisa King, Horticulture Innovation Australia, 0403 378888 or elisa.king@horticulture.com.au



Hornsby Advocate, Sydney
16 Apr 2015, by Laura Trieste
General News, page 42 - 239.00 cm²
Suburban - circulation 51,035 (---T---)

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BRIEF APPLES

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TASTE JUST RIPE

VERSATILE FLESHY FRUIT IS IDEAL

Laura Trieste

IF YOU have ever thought about adding more papaya or papaw to your meals, now is a good time to do it.

These exotic fruits are available all year round but are at their peak in autumn and spring.

"The weather conditions have been quite favourable for an excellent crop of good quality in terms of flavour and shelf life," Papaya Australia president Gerard Kath said.

Both fruits come from the same plant, but are easy to tell apart as papaya is often pear-shaped with an orange to red flesh and papaw is yellow and has a rounder shape.

"I would always recommend trying the red papaya first because it's slightly sweeter and a better flavour," Mr Kath said. "The yellow papaw is more bland and it's an acquired taste."

They are a common ingredient in many pharmaceutical products these days because of their health benefits, from being high in nutrients and antioxidants, as well as their fibre that can help digestion.

When buying them from the grocer look for a vibrant coloured flesh without too many marks or bruises.

FRUITY TIPS

- For a peppery substitute, save your papaya seeds and grind them to use in place of pepper.
- Poach papaya and cranberries in a syrup of lime juice, cinnamon, star anise, sugar and water for a citrusy dessert.
- Whip up a spicy papaya/papaw salsa by combining it with red onion, coriander, lime juice and red chilli.

You can ripen them in a fruit bowl before storing them in the fridge.

"They are ripe and ready to eat when they give to a gentle pressure," Mr Kath said.

"A common way is having them fresh with a bit of lime or passionfruit." They also make a great addition to many sweet and savoury dishes thanks to their versatile flavour that goes well with ingredients like coconut, seafood, salads, curries, pork, chicken, mango, ginger, pineapple, kiwi, banana, lemon and berries.

"I often have papaya as a breakfast combo with cereal," Mr Kath said.

"I don't like a fruit salad unless it's got some papaya and papaw in it."

Details: australianpapaya.com.au



Papaya and coconut muffins recipe from Papaya Australia.



Papaya and papaw are in peak season.

Research on Medically Active Constituents of Papaya

In February this year, another scientific paper was published asserting that papaya plant parts could have bio-active constituents that are useful in human health. As is often the case, this research comes from countries where the use of the plant in traditional medicine is common.

The abstract from the paper is below, and the full article can be found at www.ijpsr.com. DOI link: [http://dx.doi.org/10.13040/IJPSR.0975-8232.6\(2\).880-83](http://dx.doi.org/10.13040/IJPSR.0975-8232.6(2).880-83)

The research is mentioned to keep growers aware of ongoing work that might have commercial opportunities associated with it in due course. It is not mentioned in order to support self-medication by readers.

ABSTRACT:

Whole plant parts, fruits, roots, bark, peel, seeds and pulp of *Carica papaya* are known to have medicinal properties. It has been used for treatment of numerous diseases like warts, corns, sinuses, eczema, cutaneous tubercles, blood pressure, dyspepsia, constipation, and general debility. It has also been used to expel thread worms.

Ayurvedic literature reveals that papaya leaf extract has properties to slow bleeding and recent studies revealed its ability on platelet augmentation in a cyclophosphamide induced thrombocytopenia rat model. Pilot studies done in dengue patients with leaf juice revealed the effect of leaf juice on elevating white blood cells, platelet count and recovery without hospital admission.

Hence, in the current study, an effort was taken to study the phytochemical profile of papaya leaf extract using Liquid Chromatography-Mass Spectroscopy (LCMS). Aqueous extract of young leaves were taken and subjected to LCMS analysis for phytochemical profiling using water and acetonitrile as mobile phase.

On LCMS analysis followed by integrated library search, 21 constituents were identified and it included pharmacologically active phyto compounds, alkaloids, phenolics, flavonoids and also, amino acids. Further studies can be done on these constituents to identify and isolate the most active bio constituent attributing platelet augmentation, anticancer property, anti acne activity, and relieving nausea.

Robotics to Play Key Role in Horticulture

Robotics are set to play a key role in the future production of Australian vegetables with key horticultural growers, researchers and commercial partners meeting in Melbourne today to develop an investment strategy for agricultural robotics and automation, a first workshop of its kind led by Horticulture Innovation Australia (HIA) in collaboration with AUSVEG.

Identifying industry priorities for future vegetable levy investment of robotics application was the overall outcome of the workshop, which included presentations from leading academics, growers and industry representatives. Current and future investment opportunities, including the barriers of technology commercialisation, were also discussed at length. HIA CEO Mr John Lloyd said it was

a productive workshop with all stakeholders committed to driving the agenda forward.

"This workshop demonstrates HIA's new way of showing leadership in the horticulture sector by instigating better ways of consulting with key industry stakeholders to address strategic issues and ultimately achieve outcomes that benefit our growers," Mr Lloyd said.

"It's about keeping growers' needs in mind; focusing on identifying the problems they face and collaboratively finding a solution. "Using data collected from robotic equipment will undoubtedly play a key role in improving growers' management of their produce. Robotic trials are continually proving their many benefits, from increasing yields and decreasing

chemical use, to one day forming an integral part of auto harvest systems. So, now it is just a question of when they will be commercialised."

AUSVEG CEO Mr Richard Mulcahy said he was pleased Australian vegetable growers could be part of the event, which highlighted the industry's ongoing commitment to productivity-enhancing innovation.

"Agricultural robotics and automation is one of the most exciting areas of industry research and development currently underway, and it is important that the industry keeps abreast of the latest developments to ensure we remain productive and profitable in the years ahead," Mr Mulcahy said.

HIA EXTRA 2

**Horticulture
Innovation
Australia**

*Refresh
Yourself*



**MARKETING
IN THE
SPOTLIGHT**

REFRESH YOUR LIFE WITH AUSSIE APPLES

Australians are refreshing themselves in droves thanks to Aussie Apples and the launch of a new campaign, 'Refresh Yourself'. This is the first year of a new five-year strategy to prompt Australians to reach for fresh Aussie Apples when on-the-go. Apples are a staple of most shopping baskets but the campaign aims to reinvigorate perception and appeal to a young adult audience. The refreshed brand campaign features a range of activations in market including film promotions, footy in schools and clubs, fun runs and a Royal Show roadshow. Go to aussieapples.com.au or look for Aussie Apples on facebook for more details.

HIA TRANSFORMATION UPDATE

Welcome to the second Horticulture Innovation Australia Limited (HIA) Transformation Update. This month, HIA has been focussed on building the internal processes required to support to our new grower-owned model. Just some of the areas of focus include:

New funding model

The new funding model features two core investment pools – Pool 1 and Pool 2. In Pool 2, HIA will be investing in strategic, long term R&D. To make the model work, the structure of HIA will need to be adjusted. Our recent focus has been on defining the new roles, responsibilities and business functions required to ensure the new funding model operates successfully. Once we have these structures in place, we'll be ready to rapidly establish new funds in Pool 2 based on the feedback from our current consultation process.



Procurement and advisory services

The way we seek advice on what to invest grower levy dollars in and how we then procure those services is changing. We have been working closely with a number of industries to trial new procedures, tools and templates around procurement, refining our processes along the way to ensure the process is smooth, consultative and thorough. The new procedures, tools and templates are being piloted in May and June and will be refined based on grower feedback.

Membership drive

What does it mean to be a member of HIA? It's about having access to the latest information on R&D and marketing investments, supporting the levy system and making sure you get the chance to have a say and vote at our first Annual General Meeting in November 2015. We're currently in the process of identifying eligible voting members and you'll be hearing more in the coming weeks. In the meantime, we ask all of you to encourage your fellow growers to make sure they 'get on board'.

New HIA organisation design and governance

Several workshops have been held recently to look at the needs of our key stakeholders in order to get a good understanding of the structures and systems required for the future. Ultimately, this initiative is about how HIA can structure the organisation to increase grower productivity, improve farm gate profitability and drive global competitiveness for Australian horticulture. HIA needs to be focused on listening and communicating so that every levy dollar is invested wisely.

We hope you have found our second update informative.

If you would like more information or to provide feedback, please email us at transform@horticulture.com.au.

Horticulture Innovation Australia Limited

Email: transform@horticulture.com.au

horticulture.com.au

Origins of Hermaphrodite Papaya

A genetic study of papaya sex chromosomes reveals that the hermaphrodite version of the plant, which is of most use to growers, arose as a result of human selection, most likely by the ancient Maya some 4,000 years ago.

The study, reported in the journal Genome Research, homes in on a region of papaya's male sex chromosome that, the study indicates, gave rise to the hermaphrodite plants.

Among the male papaya plants, the team identified three distinct wild populations: MSY1, MSY2 and

MSY3. Their analysis revealed that the MSY3 population was most closely related to the hermaphrodite sex chromosome. All of the MSY3 plants in the study were from the northwest Pacific coast of Costa Rica.

Given that no wild hermaphrodite papayas have been found in Central America, "this strongly suggests that the (hermaphrodite papaya) resulted from papaya domestication by the Maya or other indigenous groups," the researchers wrote.

"This research will one day lead to the development of a papaya that

produces only hermaphrodite offspring, an advance that will enhance papaya root and canopy development while radically cutting papaya growers' production costs and their use of fertilizers and water," said University of Illinois plant biology professor Ray Ming, who led the research.

The story above is based on materials provided by University of Illinois at Urbana-Champaign. The original article was written by Diana Yates.

<http://www.illinois.edu>

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The Australian Government provides matching funding for all HAL's R&D activities.

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your industry body



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Papaya Post

*...news that's so fresh its green...
and some with a hint of colour*

The Chairman's Report



Dear Papaya Post Readers,

We are again fast approaching the end of another challenging year. It is now end November and still no rain fall in sight with dry hot windy days and cool nights being experienced in most of the far North. The winter cold is well and truly gone, however most plantations are not jumping out of their skins in terms of plant growth.

I am well aware that one or two good rain falls can change all that very quickly. In the short 20 years that I have been in the far North, I can remember just one year where next to no rain fell for the nine months up to Christmas. I have heard reports that even the coast is very dry and brown with cane crops severely wilting and all grazing areas totally eaten out and bare. Let's hope rain is just around the corner.

Industry Production

Sept, Oct, and Nov, are normally very high production periods for our industry, however this year the numbers seem to be back somewhat. I can only suggest that this is due to a slight decrease in tree numbers and mainly tree production back due to the cooler nights and extreme dry. The result in terms of prices has been very

favourable, with most fruit selling well of late.

The spring period is always a good time for industry as most shops are looking to papaya to fill shelf space. It is always a common occurrence, that when production is back most growers do well financially due to higher prices. We are now already in the short season summer fruit period, whereby papaya competes with the likes of mangoes, lychee, stone fruit and cherries etc, for the consumer dollar. We hope that producers fare well during the coming months.

AGM & Industry Forum

The AGM and a presentation on breeding, seed production and diseases, was held in Innisfail in end Oct. This was reasonably well attended by approx 30 people.

Chat our IDO gave a summary of where we are and possible direction on breeding and tissue culture. Phil gave a talk on seed production and Richard gave a presentation on the disease poster. This was then followed by the annual levy payers meeting and then a BBQ. It was good to see some new faces along with many regulars.

We hope to again have a field day later in the year focusing on variety trials and some tissue cultures. We will keep you posted.

Papaya Ring Spot Virus

Joe Zappala and I recently attended a meeting in Bris on PRSV. The main reason why this topic is on the radar

Edition 3, Dec 2014

Briefly

- 3 Parasite attacks black spot fungus
- 4 ACIL Allen review of HAL - the recommendations
- 7 New predator species of mites available
- 8 Papaya Marketing Update
- 11 Industry Development Officer Report

is because of changes to Biosecurity Queensland's regulations governing plant and animal movement throughout Queensland. Additionally the nursery industry is pushing for a relaxing of regulations re PRSV.

This is mainly due to the fact that this disease can be spread by cucurbit plants from nurseries within the quarantine zone to areas in North Qld. There are a very large number of seedless water melons and the like being produced in SE Qld and sent to the Burdekin and Tableland.

There is a very real risk of this disease escaping the SE Qld zone and showing up in Nth Qld. This would be devastating for our industry, going on what has occurred in similar scenarios in other parts of the world.

I firmly believe that a disease incursion similar to this will again show its head in our industry one day, which will cause massive disruption and change to the

future viability of growers. Prevention is always the best course of action in regards to disease threats.

HAL / HIA Changes

Change is a certainty in life. This is very applicable to HAL and now the new HIA (Horticulture Innovation Australia).

The last six months have seen the down fall and practical winding up of HAL and now the formation of HIA. This change has been mainly brought on by the ACIL Allen report which made key recommendations to the Minister of Agriculture federally. Some of the recommendations include a formation of a new entity (HIA) with 4 HAL board members and 4 board members appointed by the Minister. (see more details pg 4-5)

There was a recommendation to abolish the Industry Advisory Committees (IACs) along with a host of other changes.

These changes were required for industries to retain the Government's dollar for dollar matched funding of R & D projects.

I for one have grave concerns with the direction this is heading and the

very lack of information on future direction. The lack of vision and detail on how this will work is very unclear, particularly with information surfacing from outside sources suggesting that deals and changes will be done without consultation of peak industry bodies.

I keep asking the question what is the difference between HAL as it was, and a HAL Mark 2, and who will be making the decisions on levy monies collected from our industry? I feel uneasy when we are told that the current system will be abolished without a detailed alternative plan. I am also uneasy when I am told, 'We have your best interests at heart, just trust us.'

I have the opinion that a lot of this change has come about from a small minority of producers and some large corporate businesses that have only recently entered the horticulture business in Australia.

I believe that horticulture has stood the test of time mainly due to small to medium size farms operated by owner operators. I suggest that corporate business does not have a very good track record in agriculture in the last 50 years.

The managed investment schemes (MIS) and large foreign companies are well known examples of the failure and devastation that has occurred, only for family farms to eventually pick up the pieces.

This article is not the right forum to comment and speculate further as to where and how R&D projects and marketing will be decided for our industry.

The only comment I would make is that with change comes opportunities. These may take time to become apparent and may take time to implement. In the mean time funding for certain projects may cease e.g. the industry funding to operate and produce reports such as this Papaya Post. We will keep you informed as best we can.

On this note, I wish everyone a very Merry Christmas and a Successful and Happy New Year. I hope that the coming wet season is not too disruptive and that production and prices remain sound.

Regards,
Your Chairman,
Gerard Kath

Papaya Pest Resistance Research

Research presented at the International Horticulture Congress in Brisbane in August of this year detailed how papaya is being used as a model crop to identify if the fruit possesses genetic markers or DNA associated with disease resistance.

Hawaii Agriculture Research Centre Assistant Professor Judy Zhu is researching and developing methods for improving papaya crop resistance to pathogens through the use of biochemical induction and genetic engineering.

"Papaya has a lot of problems in terms of diseases, not only do they have viruses but also fungal

diseases," she said. "We wanted to resolve this because farmers were losing a lot of their yield and production. So we conducted this research in order to assist them."

Plant defensins from the dahlia(DmAMP1) have been introduced as transgenes into a range of species including papaya to increase host resistance to pathogens, especially Phytophthora palmivora.

Extracts of total leaf proteins from transformed plants inhibited the growth of Phytophthora in the lab. Results from our greenhouse inoculation experiments demonstrate that expressing the

DmAMP1 gene in papaya plants increased resistance against P. palmivora and that this increased resistance was associated with reduced hyphae growth of P. palmivora at the infection sites.

The inhibitory effects of DmAMP1 protein in papaya suggest this approach has good potential to impart transgenic resistance against Phytophthora in papaya.

Professor Zhu has published several papers on methods of enhancing pest resistance in papaya. Extracts are on her home page at the University of Hawaii at Manoa . <http://www.ctahr.hawaii.edu/mbbe/zhu.html>

Hyperparasite attacks Black Spot Fungus on Papaya Leaves

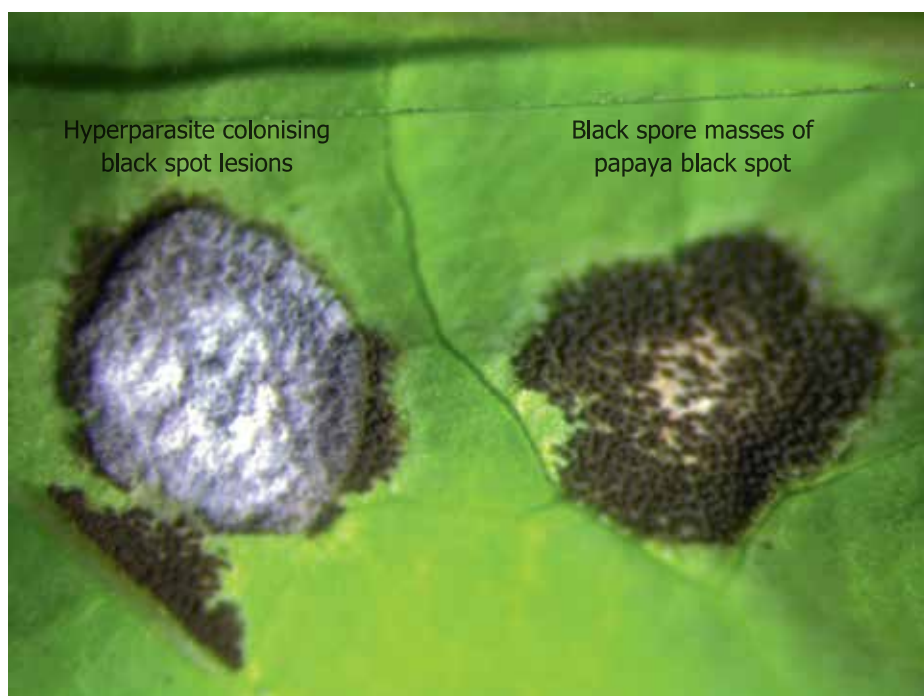


Figure 1. Black spot and a hyperparasite of black spot on the underside of papaya leaves

The leaf disease 'black spot' of papaya caused by the fungus *Asperisporium caricae* is a major problem for papaya growers during the cooler months of the year.

Initial symptoms of the disease are small, water-soaked spots which develop on the upper surface of leaves that later become greyish white in colour. Black spore masses form in these spots on the under-side of the leaf (Figure 1). Affected leaves curl, turn brown, brittle and subsequently die. At the present time control of the disease is achieved with fortnightly applications of fungicide.

Early in 2014, during a visit to Skybury Farming, the Plant Health Manager Willem Landman, brought to our attention a white-coloured fungus which was parasitising black spot colonies on the under-side of papaya leaves (Figure 1).

Subsequent culturing and microscope examination of the fungus both at the QDAFF South

Johnstone RS and at the EcoSciences Precinct in Brisbane identified the fungus as a *Ramularia* species. A search of overseas scientific literature has shown this organism to also be a parasite of the spores of rust fungi.

Further studies were conducted in the glasshouse at South Johnstone RS where potted black spot affected plants were spray inoculated with spores of *Ramularia*. Although many of the black spot lesions were colonised by the parasite, black spot continued to develop causing the death of many of the young leaves.

Microscope examination showed a direct penetration of the black spot spores by hyphae of *Ramularia* (Figure 2).

It would appear that the parasitism of black spot by *Ramularia* is slow in comparison to the development of black spot. Consequently, further research is planned where nutrient solutions will be applied with the parasite in an attempt to increase its growth rate and improve the level of black spot control.

Enquiries to Lynton Vawdrey or David East at QDAFF South Johnstone (07) 40641130

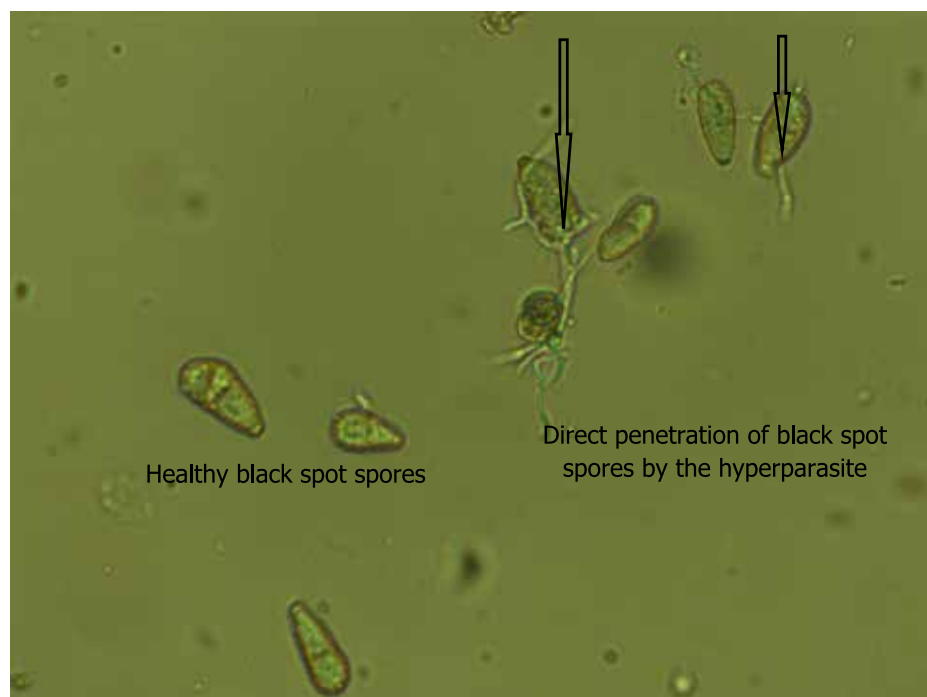


Figure 2. Parasitism of black spot spores

ACIL Allen Review of HAL: the Recommendations

The ACIL Allen review of HAL was released by the federal government to provide the background to the changes that growers will see in the new body, Horticulture Innovation Australia Ltd.

The review clarified six areas where the authors formed the view that the previous arrangements were not satisfactory:

1./ Conflict of Interest:

- Poorly defined purpose in Constitution
- Embedded by ownership structure of HAL
- Business processes do not address conflicts

2./ Multiple and Unclear Objectives

- Driven by embedded conflict of interest
- Planning hierarchy and effort skewed towards individual industries

3./ Administratively Costly

- Poor incentives for HAL, PIBs and Department of Agriculture to be efficient
- Need to develop & implement more than 50 plans and service each IAC & industry individually

4./ Variable Accountability and Transparency

- Accountability shared and poorly defined
- Poor transparency and compliance
- Variable standards for same processes

5./ Limited Demonstration of Industry Benefits

- Individual BCAs robust & measure individual sectoral impact
- Shortfall in sample of BCAs completed
- Gaps in translating high R&D into extension & pre-farm gate adoption

6./ Limited Grower and Other Stakeholder Engagement

- Dominated by IAC structure and PIB consultation to drive industry engagement

Recommendations:

1./ Establish grower owned RDC (New HAL)

2./ Remove Industry Advisory Committees

3./ Rationalise and strengthen planning

4./ Streamline industry liaison /RD&E principles

5./ Improve project management and reporting

6./ New HAL services

marketing on request only

7./ Improve direct grower communication

8./ Greater levy efficiency and transparency

9./ Improved internal accountability/processes

Each of the nine recommendations has specific suggestions for implementation.

1./ Ownership

HAL should over a transition period move to become a grower owned RDC

- Addresses conflict of interest and strengthens grower accountability and representation
- Transition through government company
- Independent board (50:50 elected/appointed)
- Voting proportional to levy dollars paid
- Company limited constitution by guarantee, clearly stating objectives and obligations

2./ Remove IACs

Remove Industry Advisory Committees but retain ability to seek independent advice

- IACs are conflicted, costly, and unwieldy
- External advice essential
- New HAL should aim to

maximise the strategic contribution and minimise the conflicts of interests for the advisory function it creates and operates

3./ Strategic Planning

Rationalise and strengthen strategic planning for horticulture RD&E

- Plethora of strategies/plans skews effort and investment
- New HAL has one strategy supported by rolling three year annual operating plans
- Industry has own strategies and RD&E

4./ Liaison and investment

The number of industry liaison and RD&E service areas or functional areas within New HAL should be streamlined resulting in significantly fewer decision making envelopes

- New HAL will liaise with growers and IRBs on plans performance using multiple mechanisms
- After allowing for whole of horticulture programs, funds allocated to industry proportional to levy contributions

5./ Projects

Improve project procurement, management and reporting

- Program basis for RD&E (multi-year, larger funding multi envelopes) focused on results and adoption
- IRBs can apply for funds, particularly in extension
- Greater decision making transparency/accountability
- Vary thresholds according to value and risk to reduce administrative burden
- Levy paying growers receive results earlier

6./ Marketing

New HAL is to engage in marketing on a fee for service basis only on request ...(cont'd pg 6)

Federal Agriculture Minister welcomes new Horticulture Body

On 7 October 2014, The Australian Government welcomed the registration of Horticulture Innovation Australia Limited as a new research, development and marketing body to support Australia's \$9.5 billion horticulture industry.

At the first meeting, to be held later this month, the members of the board will select the chair and deputy chair of the new company.

"I expect Horticulture Innovation Australia will finalise its structure and the company's constitution at its first meeting. I also expect it to commence negotiations with the government around a deed of agreement which could see it receive and invest more than \$100 million in grower levies, industry contributions and taxpayer funds in horticulture programmes annually."

The establishment of Horticulture Innovation Australia follows a recent independent report into the performance of Horticulture Australia Limited which recommended a change to a new, grower-owned research and development company.

It also follows the commencement of a Senate Inquiry into industry structures and systems governing the imposition of and disbursement of marketing and research and development levies in the agricultural sector.

"The levy system is a critical element in Australia's research and development model. It is important to ensure it is operating efficiently and effectively. That is why I support the recently commenced Senate inquiry into levies," Minister Joyce said.

"Many of the changes stemming from the HAL independent performance review are

foundational and can happen separately to the inquiry. While I do not want to pre-empt any outcome of the inquiry, there is still scope to make additional changes to the horticulture levy system later on down the track."

HAL BOARD MEMBERS

Mr Ridley Bell (NSW) – Mr Bell is a blueberry grower and the owner of Mountain Blue Farms. He is a commercial fruit grower, supplying to retailers and nurseries in both the domestic and international market. Mountain Blue Farms is committed to advancing the development of R&D in terms of breeding and technology.

Professor Rob Clark (TAS) – Mr Clark has considerable research and development experience including a previous position as Deputy Chairman of Rural Industries Research & Development Corporation and the Director of the Tasmanian Institute of Agriculture at the University of Tasmania.

Mr David Cliffe (NSW) – Mr Cliffe has broad experience across a number of horticultural industries in his capacity as a nurseryman supplying plant material to the vegetable, deciduous fruit tree and citrus industries.

Ms Susan Finger (VIC) – Ms Finger is a Victorian apple orchardist, with a successful history in farmer and industry representation organisations. She is currently a Board member of the Victorian Farmers Federation (VFF) and the immediate past president of the VFF Horticulture Group.

Mr David Moon (QLD) – Mr Moon has an understanding of company and marketing management as well as grassroots grower experience as Managing Director of Moonrocks, an onion growing company. Mr Moon is

also a member of the Agriculture Industry Advisory Committee.

Mr Stephen Morrow (QLD) – Mr Morrow has over 30 years experience in agribusiness across a number of industries as both a CEO and a non-executive Director. Mr Morrow is currently Chairman of Buderim Ginger Ltd, Chairman Priestley's Gourmet Holdings Ltd, and a Director of Pilton Valley Premium Pork Ltd.

Mr Mark Napper (NSW) – Mr Napper has 30 years experience in Australian agribusiness, 22 of which have been in horticulture. Mr Napper owns a fruit orchard in Bangalow NSW and currently grows peaches, nectarines and custard apples having previously grown avocados, mangoes and mandarins.

Mr Selwyn Snell (QLD) – Mr Snell has extensive experience as a senior executive with leading agribusiness and biotechnology enterprises in Australia and internationally. Mr Snell is currently, Chairman of the Council of Rural Research and Development Corporations, the Queensland Government's Horticultural Development Committee and Barawyn Pty Ltd. He is a non-executive Director of Plant Health Australia Limited and member of the APVMA advisory board.

Mr Peter Wauchope – (WA), Mr Wauchope is the General Manager of Center West Exports and Sun City Farms. He has a robust understanding of sales, marketing and export given Center West is a major exporter of produce to various countries including Singapore, Japan, Hong Kong, Taiwan, Middle East, and the Maldives as well as supplying the domestic market.

ACIL Allen Review of HAL: the Recommendations

continued from pg 4

...request of the body representing the industry that contributes marketing levy funds

- No funding for marketing research
- Marketing levy directly available IRBs demonstrable capacity and industry support
- New HAL can undertake marketing for a number of industries on request of IRBs

7./Grower Communications

Improve direct communication with growers

- Open direct, multiple and overlapping channels between New HAL and levy paying growers
- Any active communication to be voluntary communication
- New HAL would benefit from early direct engagement to pursue strategic objectives following implementation of recommendations 1 and 2

8./ Levies

Apply greater transparency and efficiency department's levy in the department's revenue service and levy mechanisms

- Reduce the number of different levy types
- Exceptions on case by case basis against case-by-criteria of levy collection efficiency, effectiveness and level of industry support
- Regular voting amongst New HAL members on levy rates (accompanied by discussion on use of funds and R&D effectiveness)

9./ Processes

Improve internal accountabilities and processes

- Move away from one size fits all paperwork
- Cost based charging for industry services

- New HAL's costs fixed rather than proportional to annual spend, and no requirement to spend all available funds in any one year
- No requirement to spend all available project funds in any one year
- Summary of New HAL expenditure be published

GLOSSARY OF ACRONYMS

RD&E: research, development and extension

IRB: industry representative body

IAC: the Industry Advisory Council.

HAL consulted with the IACs in developing strategic plans for expenditure of levy funds.

PIB: primary industry body/bodies

Fijian-Australian Red Papaya Research Targets Consumer Preferences

The preferred size, shape, flavour and other characteristics of Fiji's and Australia's most promising red papaya varieties will be investigated in the coming months thanks to a unique agribusiness research and consumer profiling project underway as part of the Pacific Agribusiness Research for Development Initiative (*PARDI), funded by Australia's Centre for International Agricultural Research (ACIAR) and Horticulture Australia Ltd.

Fijian and Australian researchers will investigate the scope of consumer demand and preferences for specific red papaya varieties. Their goal is to help industry overcome obstacles to expansion and significantly increase exports to New Zealand and other markets

(i.e. Hong Kong and the USA).

Red papaya is renowned for its sweet flavour and papaya is incredibly healthy (it is loaded with vitamins C, A and E and folate). Yet global consumption and sale of papaya is not as high as other tropical fruit such as banana and pineapple. Fiji has significant scope to increase exports of its branded 'Fiji Red' papaya and the Australian industry would benefit considerably from a modernised profile and the development of overseas markets.

Obstacles to industry expansion in Fiji are linked to frequent natural disasters, airfreight capacity constraints and post harvest losses in the wet season.

According to project representative,

Nature's Way Cooperative (Fiji Ltd) research and extension manager, Kyle Stice, the papaya project follows the philosophy 'consumer is king'.

"PARDI and Nature's Way Cooperative envision that if industry can better respond to the preferences and demands of consumers, this will lead to increases in papaya consumption and sustainable economic benefits for all industry stakeholders," said Mr Stice.

"Our researchers will conduct a range of studies to understand consumer preferences related to packaging, fruit size, appearance, taste, certification and branding and identify what a consumer is really ... (cont'd pg 7)

Neoseiulus Californicus Available as Predator of Certain Mite Species

Californicus (Neos) are an aggressive and robust predator. They are tolerant of a wide range of temperature and humidity conditions and are used widely overseas as a powerful biological control agent.

Californicus are able to survive well even at low prey densities due to their ability to use alternate prey and pollen as a food source. This species complements persimilis mites in many crop situations.

Target pests

Californicus feed on a range of pest mite species including:

- two spotted spider mite - Tetranychus urticae
- broad mite - Polyphagotarsonemus latus
- cyclamen mite - Steneotarsonemus palfidus

An adult female predatory mite can consume more than five spider mite eggs per day.

Suitable crops / environment

Californicus mites are tolerant of a wide range of climatic conditions and can be used at times where other species may struggle. They can work in harmony with Persimilis to manage a difficult situation.

Neoseiulus californicus prefer humidity of 60% or higher and a temperature range of 16-32°C. It is important that the crop is well watered and in a good state of

health to ensure best conditions at the plant surface where the mites are active.

Before release

Check prior history of chemical applications to ensure toxic residues are no longer present. Some chemicals have a long persistence and this will need to be considered. Generally high temperatures, exposure to ultra violet radiation and rainfall will accelerate the degradation of harmful poisons. Chemicals vary widely in their toxicity to these predatory mites so you should check with us if unsure.



Californicus adult predatory mites feeding on spider mite eggs (Photo Dan Papacek)

It is always best to commence releases of biological control agents before you have a serious pest problem. Ensure the crop is well watered and in good health as much as possible as this will aid establishment.

Spider mite levels

If spider mites are already present in large numbers within your crop

then the use of a compatible pesticide is recommended to reduce the population density before releasing Californicus.

Californicus is a specific spider mite predator. Early and regular introductions are the most effective control measure. Avoid toxic pesticides to allow Californicus the opportunity to build up in the crop.

for further information contact
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Californicus mite predator at work feeding on spider mite eggs (Photo: www.entomology.umn.edu)

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... really looking for when they buy a papaya."

Consumer sensory preferences will also be studied as part of the project. This will be carried out by a specialist sensory analysis team from Queensland, Australia, who will survey Australian and New Zealand consumers and identify their tastes (in terms of flavour, texture and other sensory

characteristics) and buying behaviour. The 'Fiji Red' papaya and a range of red and yellow varieties from Australia will be profiled.

PARDI leader, University of Queensland Associate Professor Steven Underhill, believes taste and sensory research will provide significant marketing benefits for industry.

"Up until now, Fijian and Australian papaya have not benefited from consumer research, whereas other industries, i.e. banana and pineapple, have considerably improved their profiles by targeting consumer needs," he said.

<http://www.spc.int/lrd/news/pardi-news/fijian-australian-red-papaya-research-targets-consumer-preferences>

Papaya Marketing Update

Papaya and Papaw's new brand positioning focuses around the health attributes of both fruits:

'Papaya and Papaw is inspired goodness helping you to keep things fresh every day.'

To build new generations of papaya and papaw lovers our target market is young families.

A Health & Wellbeing Report to ensure accuracy behind our messaging was completed and is the basis for all communication.

The report is available to growers in the industry section of the recently updated papaya consumer and industry site at www.australianpapaya.com.au.

Re-launched in September, the industry website also contains key documents like the Biosecurity Manual, Strategic Investment Plan, Papaya Permits etc. If you haven't already please logon to check it out.

Australian Papaya's Facebook page launched on September 15th. It is

off to a great start with over 500 page likes and a great response to the competitions. Please like @australianpapaya so you can see the activity.



Facebook has over 13.6 million active users. It allows brands to have complete control over messaging to consumers and is cost effective communication. If you don't use Facebook you can keep up to date by going to the website www.australianpapaya.com.au which has a feed direct from Facebook at the bottom of the home page. You can see below how it looks.

PR Campaign and Media

The PR Campaign ambassador is Caitlin Reed an accredited dietitian with extensive media experience who adds credibility to our inspired goodness messaging.

Caitlin created 4 new tasty recipes, 3 of which featured in the spring media release. The 4th recipe will be used for the autumn release.

SALMON WITH PAPAYA SALSA



PRAWN, AVOCADO AND PAPA W SALAD



Papaya and Papaw is inspired goodness helping you to keep things fresh every day.



The Point of Sale (front of house and backroom educational posters) were also updated with our new 'inspired goodness' look and feel.

In September the point of sale was merchandised in 240 green grocer stores on the east coast of Australia creating great awareness and education on the differences between red papaya and yellow papaw.

For more information please contact Elisa King from Horticulture Innovation Australian on either elisa.king@horticulture.com.au or (02) 8295 2332



Inspired Goodness

Seasonality
Year round with increased supply during Spring and Autumn.

Storage
To open fruit store between 20 - 25 °C. Once ripe store fruit between 12 - 14 °C.

How to Display
Display and label Red Papaya and Yellow Papaw separately to avoid consumer confusion.
Consumers prefer to buy fruit in half with seeds intact. It displays the internal fruit characteristics and allows purchase of preferable portion sizes.
Ripe fruit is best displayed on open shelf. Cut fruit should be properly wrapped and displayed in fridge at 12 °C - 14 °C.

Red Papaya
Red Papaya is ripe when skin is yellow. When ripe, cut fruit should have bright orange-red flesh. Both fruits are ripe when yield to gentle pressure.

Yellow Papaw
Yellow Papaw is ripe when the skin is yellow/orange. Ripe fruit when cut has bright yellow/orange flesh and black seeds. Both fruits are ripe when yield to gentle pressure.

australianpapaya.com.au [/papayaaustralia](https://www.facebook.com/papayaaustralia)

Red Papaya

Orange to red flesh
Often pear shaped
Sweet flavour

Yellow Papaw

Distinct yellow flesh
Larger and round
Less sweet flavour

australianpapaya.com.au [/papayaaustralia](https://www.facebook.com/papayaaustralia)

Inspired Goodness

As you will have seen in the Chairman's Report, Horticulture Australia Ltd has changed. The full implications of the changes are not clear but the Chairman has signalled it is possible that this is the last edition of the Papaya Post.

I owe thanks to many people.

Without the support of the Board of Papaya Australia, I would not have had this opportunity. Thanks to you all.

Many people contributed to the content of each issue. I especially recall the consistent input from the research staff at the various state departments of agriculture. Private companies provided input in the broader industry interest.

Most importantly, I send my thanks to you the reader. It has been my pleasure to provide you with articles that I hope dealt

with issues that matter to you. There were other articles that I hope were interesting to you, and still others that I thought might stimulate your imagination. Business does not stand still, and although that presents challenges, it also gives opportunities.

I am fortunate to be able to look forward to new challenges as we establish an export office in China for our horticultural management software, over the coming year.

Horticulture takes sunlight, water, soil and a small amount of fertiliser and puts it through a biological factory in the form of a living plant to create a product that is much more interesting than the inputs suggest. It is indeed industrial magic.

If I do not see you around the corner of this change, I wish you well.



Papaya Australia Ltd.

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Papaya Australia Ltd

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Horticulture Australia

Horticulture Australia Ltd.

www.horticulture.com.au

First Report of the Papaya Industry Development Officer

First of all, please allow me to introduce myself. I am Chutchamas Kanchana-udomkan (Chat is the short version), the new IDO of Papaya Australia. I was appointed to the position and started in July 2014. Below, I talk about some activities I have done since then.

International Researchers meet Growers

Back in August 2014, the IV International Symposium on Papaya was held at the same time as the 29th International Horticulture Congress in Brisbane. Research results in papaya breeding for fruit quality and PRSV-P resistance were presented orally in the symposium.

After the Congress, a group of researchers from Hawaii and Australia were supported from HNRN project to visit the main papaya-growing regions in North Queensland. The participants consisted of:

- two papaya experts from Hawaii, Dr Maureen Fitch and Dr Judy Zhu;
- a grower and breeder from Mexico, Diego Urena;
- an expert in genome analysis who has been involved in papaya research over the past three years, Dr Rebecca Ford;
- a PhD student in breeding for papaya fruit quality, Usana Nantawan (also known as Mai);
- and myself.

Knowledge exchange between experienced growers and researchers was the key outcome for the papaya farm visit. The visit also assisted the international visitors to get a better understanding of papaya production in the main growing regions. Production problems in Australia, Hawaii and Mexico were addressed in the meeting after farm visits in Innisfail.



Group photo at Hayden Darveniza's farm, Innisfail, QLD. From left: Ron Fitch, Dr Maureen Fitch, Craig Darveniza, Dr Judy Zhu, Mai Nantawan, Chat Kanchana-udomkan, Hayden Darveniza, Diego Urena and Dr Rebecca Ford

Five farms were visited: three in Innisfail (Mark Darveniza, Hayden Darveniza and Michael Oldano) and two in Mareeba (Skybury Farmgate and Lecker Farming). Both growing regions showed their production systems from seed germination, through planting, harvesting and packing systems. Good relationships have been developed among scientists and growers from overseas and within the country.

Supply Chain Introduction

Another part of my role is to understand the supply chain of papaya in Australia. A chance to visit Brisbane Markets Rocklea and talk to some agents arose in September. In general, papaya fruits are sold through an agent who marketed papaya and some other fruits. The fruits are sold either direct to local markets or to other big supermarkets such as Coles, Woolworths, and Aldi. I also had a chance to visit the new facility and warehouse of Jet Tipper. It was an interesting experience to be able to see and learn the big picture of papaya from paddocks to tables. The market will be visited again early next year.



Farm Visits and Introductions

In the past months, there were farm visits to growers in Innisfail (Joe Zappala, Noel Stevenson, Carolyn and Bob Broom, Hayden Darveniza, Leo Ruddle), Tully (Mackays), and on the Tablelands (Michael Canzian, Lecker Farming). Each area and farm has his/her own techniques.

The main problem for papaya production that is always mentioned, especially in Innisfail, is root rot diseases, caused by *Phytophthora* infection.

Interestingly, everyone seemed to have spray burn problem to their crops. Another complaint was the dryness of the weather even in Innisfail. More farms will be visited in Innisfail, Mirriwinni and on the Tablelands before Christmas this year. Hopefully by that time we will get some rain.

A fascinating thing that I have learnt from discussing the industry with different growers and observing the trees of each farm in different growing regions, is that each grower has his/her own beliefs in regards to crop

management. Each variety also performs differently in different plantations. One major concern in one growing area could be just a little issue in another growing region. Selection for best variety in each growing region is a must.

This confirms the potential benefits of the current breeding project to improve commercial varieties. The next phase of the project, 12 crosses will be planted in 3-4 different farms in April 2015. Some tissue cultured plants of RB1 and RB4 varieties will be also provided for this trial.

[My aim is to visit as many farms as possible to gain a better understanding of papaya as a whole.](#)

[Please feel free to contact me anytime if you would like a visit.](#)

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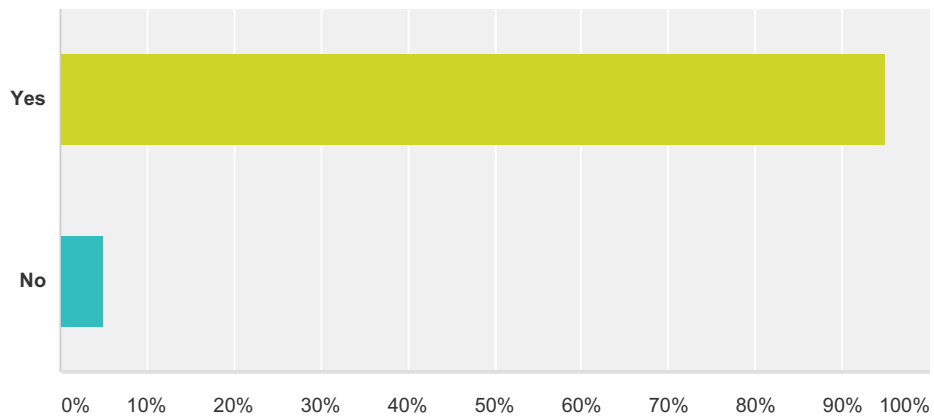
[Mobile phone: 0459 494 383](tel:0459494383)



Figure: Papaya plantation on the Tableland (top pictures) and in red soil in Innisfail (bottom pictures)

Q1 Do you find the content in the Papaya Post relevant?

Answered: 20 Skipped: 1



Answer Choices	Responses
Yes	95.00% 19
No	5.00% 1
Total	20

#	If you answered NO, please provide your comment:please specify)	Date
1	Did not receive one	6/2/2015 9:38 PM
2	never recieved it	6/2/2015 7:13 PM

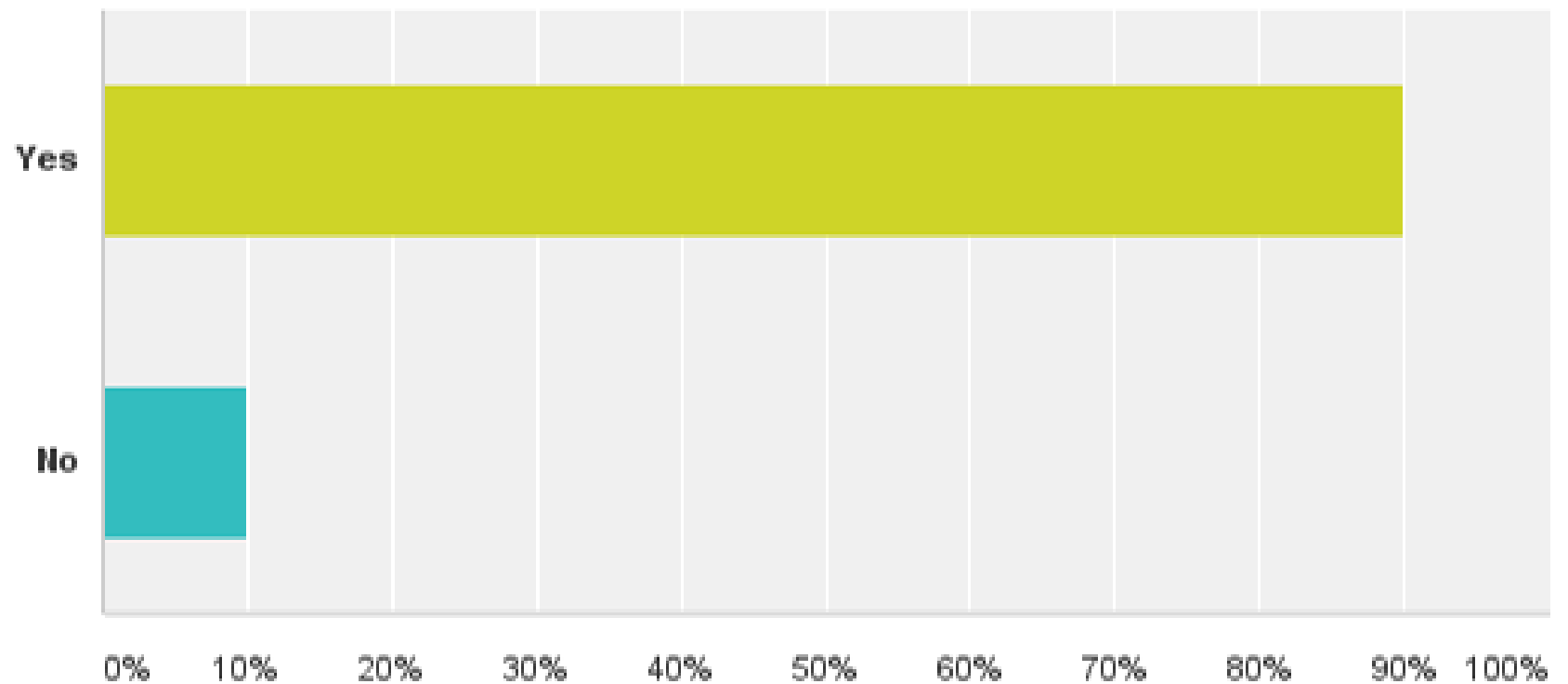
Q2 What would you like to see more of in the Papaya Post?

Answered: 15 Skipped: 6

#	Responses	Date
1	Communication on future marketing strategies.	6/19/2015 8:31 PM
2	nutrition for pawpaws, sourcing of seed varieties, info on growing from seedling to harvesting, ideas from pawpaw farming in other countries, disease and pest control, biosecurity.	6/8/2015 1:49 PM
3	as a new grower more about the growing of papaya , variety's ect	6/5/2015 2:59 PM
4	happy as is	6/4/2015 10:15 PM
5	more of the same plus other relevant information in relation to grow, pest management that works as seasons change/pests evolve, marketing issues, etc. its pretty good now.	6/4/2015 9:47 AM
6	Best practices that are working for other growers such as pest control, weed control, mulching practices etc	6/3/2015 6:24 PM
7	Evidence of more publicity and advertising to promote papaw and papayas and their health benefits to the general public. Bananas have such a good campaign for promotion but we see nothing for Papaya. What is the papaw levy spent on?	6/3/2015 1:43 PM
8	Find it easy reading with good information in it	6/3/2015 1:34 PM
9	Better market info	6/2/2015 9:52 PM
10	more information on disease and pest control	6/2/2015 8:55 PM
11	more research results on breeding, propagation, pest and disease control.	6/2/2015 8:11 PM
12	disease and fertilising info	6/2/2015 7:36 PM
13	would like to see it	6/2/2015 7:13 PM
14	Market feed back, sale price and quantity eg.like daily banana report	6/2/2015 5:18 PM
15	test from JS	6/2/2015 4:02 PM

Q3 Are you happy with four publications per year?

Answered: 20 Skipped: 1



Q4 Would you prefer to receive the Papaya Post by email or post?

Answered: 20 Skipped: 1

