

# PAPAYA PRESS

ISSUE 2 - NOVEMBER 2018

## Exporting growth through levy funded 'Papaya Industry Export Market Development Strategy 2023'

Dr. David McKinna

**G**lobal production of papaya in 2016 was 12 million tonnes, indicating a consistent growth of 40% across the last decade. However, in this global context Australia is only a small player, which is why the Papaya Industry Export Market Development Strategy 2023 has been developed; to strategically review and identify potential opportunities for Australia entering the export market.

In March this year, our team in conjunction with MCKINNA et al, performed market analytics as part of the *Tropical Fruit Industries Export Strategy (MT17002)* across a range of commodities. Using the Market Potential Index (MPI) we were able to identify a potential export market of approximately 310 tonnes could be achievable for the papaya industry by 2023. Our Australian Tropical Fruit Export Strategy identified local weather conditions as a definite advantage, but also that Australia's underdeveloped export supply chain, high labour costs, and issues surrounding the nature of the fruit, were key barriers inhibiting market expansion on a global scale. Findings from these market analytics were used to underpin and inform Hort Innovation's investment in export.

The Papaya Strategic Investment Plan (SIP) identified the driving and

development of growth strategies for Australia's domestic market long-term, and export development, as a priority; aiming to improve market access and consumer demand. The Papaya Industry Export Market Development Strategy 2023, was developed using levy funding from the papaya industry and Australian government. The aim is to improve export market supply chains, increase product development, and to strategically engage and access new markets for industry growth and expansion. The implications would be significant for the industry, particularly for growers.

Ideally, this strategy will provide a valuable resource for both growers and industry, to capitalise on investment opportunities. Although Australia's tropical fruit industries are in the early stages of its export journey, the potential opportunities for growth and development is encouraging. Australia's stable weather conditions for example, means export is possible across multiple seasons if a global competitor is experiencing crop failure; common considering papaya is heavily grown in countries subject to severe weather events. We are lucky to have extensive choice in papaya varieties, and great potential lies with growing interest for red papaya.

To achieve the goal of 310 exported tonnes by 2023, our next steps must

be focused on addressing these key barriers and challenges. We need to work at developing the supply chain and support within the industry, and build a system where this highly perishable produce can be shipped overseas, or look at investing more money into research and development to improve its appearance.

*Following the findings from this strategy, Hort Innovation aims to work with the papaya industry to gauge interest in more levy investment being directed towards trade research and development.*

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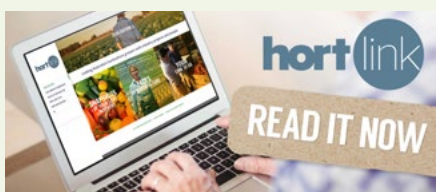
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**Hort Innovation**  
Strategic levy investment

**PAPAYA FUND**



## See your levy at work with the latest HORTLINK!

Get an update on all new, current and recently completed levy-funded activity with each edition of Hort Innovation's Hortlink. You can always find the latest edition on the Hort Innovation Papaya Fund page at [www.horticulture.com.au/papaya](http://www.horticulture.com.au/papaya).

As well as easy-to-read project updates, results and resources you can use in your business, Hortlink includes case studies, industry contacts and more. Don't miss the Faces of Horticulture section, which includes a closer look at Hort Frontiers activity, scholarship opportunities and other handy info!

Stay in the loop with your levy by becoming a member of Hort Innovation, the grower-owned, not-for-profit research and development corporation for Australian horticulture. Paying a levy doesn't automatically make you a member, but signing up is free at [www.horticulture.com.au/membership](http://www.horticulture.com.au/membership).

# From the Chair

**GERARD KATH**

**W**elcome all Papaya Press readers to the second edition of this communication post.

We are now past mid-September and temperature, fruit volumes and sales all seem to be hotting up. Our industry often enjoys a marketing window in spring prior to the big influx of short season summer fruits. It is an opportune time for our product to shine and grow sales to new and existing customers.

I appreciate that in last three months fruit volumes have been slightly below expectations, however my feeling is that for the next few months prior to Christmas there will be large volumes of fruit coming. The challenge is for every grower to harvest, market and profit from this challenging period.

I still see a positive future for our industry and this seems to be shared by a range of growers to invest in greater plantings. I believe this to be occurring in a range of regions from Lakeland to the tablelands to the coast. The major expansion is obviously in the red papaya lines, with RB1 being the predominant line.

### Hort Innovation Changes:

I just went back to read a report I wrote in June 2015. I commented on the changes occurring from HAL to Hort Innovation and the possible effect this may have on our industry. I noted that change is the one constant. Well, change is still very much occurring at Hort Innovation.

Brad Mills has been replaced by Christian Patterson as the relationship manager and Elisa King is back again as marketing manager. I have mixed thoughts on these changes as Elisa King has been one of our best marketing managers and Brad Mills was very good as industry services, yet it is very difficult for managers to contribute greatly if they are continually being moved around.

We welcome Christian Patterson's appointment and will surely have



many robust discussions regarding research and development programs. I can report that of late we have had some deep discussions around the 'clean seed project' (Papaya sticky disease) and mainly about the breeding project. Open and frank discussions are always best and hopefully positive results will be achieved. We are all on the same page in wanting the best possible outcome for the levy money collected, particularly in relation to the two projects mentioned above. Time will tell as to the value of dollars invested.

On that note, change and time will always be occurring and results should be for the benefit of all levy payers.

Best regards.

**Gerard Kath**



Christian Patterson

# Consumer research indicates awareness and trial is key to industry expansion

ELISA KING, MARKETING LEAD,  
HORT INNOVATION

Earlier this year, Hort Innovation made a levy investment into papaya consumer research, with the aim of using the findings and insights to help further grow and develop the papaya market. The research has been used to inform and shape the industry's Strategic Marketing Plan for the next 3 years.

The research suggests that 95% of consumers are open to trialling papaw or papaya which is an encouraging result. Specifically, on papaya, less than 20% of consumers have purchased papaya in the last 12 months however this specific group account for almost 80% of papaya purchases.

This type of insight suggests that awareness driving activities and sampling programs are critical to helping improve the market penetration of papayas domestically. From the insight noted above, once consumers have trialled papaya, experienced its flavour and understand their health benefits, they become loyal and purchase more frequently.

Furthermore, regular consumers of papaya possess extremely positive perceptions and attitudes towards the fruit. Among frequent consumers, 89% love the taste, 88% like texture, 91% believe it's great for health, and 91% consider it easy to prepare and can be eaten any time of the day. The opportunity lies in ensuring current non-purchasers are aware and experience these positive attributes to drive them to become regular papaya consumers.

*For a detailed copy of this report, 'Consumer research driving growth for Papaya', please contact Marketing Lead, Elisa King at [elisa.king@horticulture.com.au](mailto:elisa.king@horticulture.com.au).*

A key lever in generating awareness of papayas among target consumers is through social media. Historically, we have seen strong engagement on social posts relating to grower content. We encourage our growers to submit content that can be featured on the papaya social media platforms. This provides a great opportunity to connect consumers with our growers.

Send through images or videos, with your social media handle so we can tag you. Capture something unusual, interesting or simply beautiful, that shows off your produce.

**Check out these top tips to get the most out of your social media post!**

- Use lots of natural light – and keep the sun behind you
- Take pictures and shoot video in landscape mode
- Try to capture at least one person in the shot
- Move close to what you are capturing
- Remove anything that is distracting from the main image
- Take a variety of shots

**NOTE:** When sending through images and/or videos, please include the name of your Facebook and/or Instagram page so you can be tagged. If you do not have one, just include your name and the name of your farm so it can be included in the post. Also ensure that all people featured in the pictures are happy for their photos to be used for the above purposes.

Let's spread the word and get papaya in every Australian trolley – know it, taste it, love it!

## PP17001 “Papaya Consumer Research”

'PP17001 Papaya Consumer Research' project was developed to better understand the current Australian papaya consumer landscape.

Based on the study, most papaya purchasers belong to young families (34%), or are young professional (35%) households. The most popular age group of papaya purchasers are between 35-54 (35%), followed by 18-34 (34%). Interestingly, most purchasers skew strongly towards metropolitan areas (72%), specifically in NSW/ACT (26%) then VIC (27%). Those with an Asian background account for 22% of papaya purchasers, and over index significantly versus those with Asian backgrounds that do not buy papaya.

*For a copy of the 'Farmer Content Guide' or to feature your grower content on papaya social media, email Marketing Lead, Elisa King, or the agency at: [lina@bitecom.com.au](mailto:lina@bitecom.com.au).*

**Hort Innovation**  
Strategic Levy Investment

**PAPAYA FUND**

This project has been funded by Hort Innovation using the papaya research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit [horticulture.com.au](http://horticulture.com.au)



Amanda Arbuckle's husband Ken.



Amanda Arbuckle (centre).

## GROWER PROFILE:

# Amanda Arbuckle, Innisfail

**A**manda Arbuckle made the move back to Innisfail in Far North Queensland in 2016, after she and her husband purchased a papaya farm; expanding their family run papaya business from five to forty acres.

Her parents have run a papaya farm there since 1986, and even though the long and strenuous hours remain unchanged, Amanda has noticed many aspects of papaya farming that have changed significantly since her childhood.

“When I was a kid, we had flat-pack boxes delivered that we had to fold and staple together. The finished pallets of fruit were driven on the back of the ute to meet the train once a week. Now, we have preassembled trays delivered and completed pallets of fruit are collected from our shed by the transport company daily.

Although some aspects of papaya farming have become more efficient, harvesting and packing the fruit is still labour intensive. Our workforce has changed considerably to reflect the needs of our growing farm and we

now employ a team of backpackers to help with the many aspects of papaya farming including planting, weed control and harvesting. Since joining the family farm, we have incorporated technology into our farming practices by using the iPad to record and track our production and camera drones to help monitor the health of the crops. We are also trialling the use of a spray diary and chemical inventory apps.”

Off the back of latest research conducted by Hort Innovation on Papaya consumer research PP17001 earlier this year, Amanda said there is huge potential for growth in the papaya industry, and sees tremendous value in trying to connect with consumers from different target demographics.

Last year, Amanda represented growers and volunteered her time attending a ‘Pregnancy, Babies and Children’s Expo’. “I thought it was a great opportunity to represent growers, and was very worthwhile having someone who could relate to pregnancy, and showcase the produce,” she said.

“Papaya is such a versatile fruit that’s very nutritious. But, I have found that there’s a lot of confusion surrounding papaya; with people not knowing when it’s ripe, or how easy it is to prepare.

I think that potential value lies in targeting the right group of people, such as the hip, younger, and more health-conscious demographic – just consider what they did for the avocado industry.

Increasing consumer demand and targeting the next generation with more effective marketing and promotion that highlights just how easy they are to consume is the way forward.”

The family-run farm has seen a decrease in production this winter, mainly because of the cold weather. “This year we have lost many trees to dieback, causing production to slump significantly. Papaya are fickle plants and no one really knows why they have succumbed to dieback this year.” However, they are expecting production to increase soon, coming into peak growing period. With the warmer weather, the unsightly



Amanada Arbuckle's husband Ken and son Archie.


winter spot on the skin of the fruit clears up; minimising waste through discarded fruit.

As growers, they are passionate about minimising pesticide use and ensuring their business is as environmentally sustainable as possible.

The papaya grown on their Innisfail farm is distributed to both fruiterers and supermarket chains in Queensland, New South Wales, Victoria and South Australia.

Domestic demand for their fruit has increased, however this hasn't translated to the international market.

While they've tried to export to New Zealand a couple times, Amanda said it wasn't overly successful; with the cold New Zealand weather being a key problem, as the fruit struggles to ripen successfully.

A closer look on how to increase consumer demand for the domestic market is where Amanda sees potential for industry growth, and having relocated back to Innisfail she's back in the thick of it and perfectly positioned to help make it happen. 

## R&D UPDATE: Discovering sweet genes in papaya

CHAT KANCHANA-UDOMKAN, MAI NANTAWAN AND REBECCA FORD, GRIFFITH UNIVERSITY

**A**long with flavour, sweetness is an important papaya fruit quality trait that needs to be preserved at point of sale; particularly sweetness that is derived from sucrose. This is directly regulated by a suite of genes involved in sucrose synthesis that are likely varied in their expression during fruit maturation, leading to differences in sweetness following fruit harvest.


To better understand genetic importance for sweetness selection, nine 'sweetness genes' were identified and assessed in foliar and fruit of sweet (Sunrise Solo) VS non-sweet (RB2) papaya, that were picked over a series of fruit maturity stages; shown in **Figure 1**.

Findings indicated that most of the genes were expressed at higher levels in the sweeter cultivar 'Sunrise Solo'; where sucrose accounted for 40-60% of the total sugar detected within the fruit. To further understand the potential to use the functional sucrose-related genes for sweetness selection, their likely locations were determined on a genetic map of the papaya genome of a Sunrise Solo x RB2 cross.



Ms Mai Nantawan, a PhD candidature aligned with the papaya breeding project, receiving the "2018 Young Minds Award" at International Horticulture Congress in Istanbul.

These were associated with sweetness-related quantitative trait loci (QTL). Several sequences were identified for use in breeding to speed up the selection of the sweetest material.

This research, conducted as part of PP15000 'New genetic targets to improve quality in Papaya', was presented at the International Horticulture Congress in Istanbul by Ms Usana (Mai) Nanatwan, for which she was awarded the '2018 Young Minds Award' for the best oral presentation. 



Papaya fruits at five ripening stages, from mature green to fully ripe; as used in sweetness gene expression study. Top: RB2. Bottom: Sunrise Solo.

# REGIONAL ROUND-UP

## INNISFAIL, QLD – Joe Zappala

The last three months in Innisfail have seen a cooler and longer winter than what we'd normally see in the tropics. There has been lower than average rainfall over the last three months. This has raised concerns as to the availability of water for irrigation if the dry weather continues into the new year. The production is expected to increase significantly over the next month. With these dry conditions, disease pressure is at low levels and fruit quality is excellent! 📌

## CARNARVON, WA – Annie van Blommestein

Pawpaw production in Carnarvon has continued to be steady this season and tree health has been maintained with the good supply of fresh water from the Gascoyne River. A few new plantings have replaced older blocks that had reached the end of their productive life, with total area remaining steady. Growers have been sending both green and ripe fruit to market and quality has been good. The CGA RBG baiting team and sterile fly release program coordinated by DPIRD, together with good industry involvement has led to further reduction in the monitored numbers of wild Mediterranean fruit flies, which is good news for all growers in the district and puts total eradication on target for the near future. 📌

## TABLELANDS, QLD – Gerard Kath

Papaya production on the Tablelands is ticking over as per usual. Harvesting has been steady to a little slow of late due to both the prolonged cold winter and some crop failures due to individual specific circumstances.

However, things are rapidly turning a corner as harvesting is shortly reaching a peak for the months of September, October and November.

Fruit coming on line should be of good quality in terms of eating and shelf life, yet appearance may not be at a premium due to the prolonged cold and exceptional dry days. Cool nights, warm to hot days as well as dry windy days lead to a greater amount of skin blemishes or winter freckle.

In general, I'm seeing a large volume of fruit to hit markets from now until December and beyond that it is difficult to say as the wet season will have the final say.

In other news a few of the larger growers are expanding and there are a few new growers coming on board, which will make for interesting times ahead. 📌

## TULLY, QLD – Daniel Mackay

The Tully papaya growing region has experienced a cold and dry winter off the back of a heavy wet season. This has resulted in reduced production and a higher percentage of large fruit. However, the long cool dry winter has allowed for good planting conditions and great strike rates.

Some Tully growers have seen benefits from heavy mulching, which has suppressed weeds in their plant crop and increased soil moisture; important for the oncoming hotter months. Quality throughout the winter season was good with small amounts of winter freckle evident. Coming out of winter and into the spring months, the fruit is colouring up with glowing clean skin. In September a spring flush is typical for the Tully growing region and this year will be no different; the next few weeks should see production volumes increase. 📌

Want to submit an update from your growing region? Email industry relationship manager Christian: [christian.patterson@horticulture.com.au](mailto:christian.patterson@horticulture.com.au)

## Exporting growth through levy funded 'Papaya Industry Export Market Development Strategy 2023'

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### AUSTRALIA: CURRENT PAPAYA MARKET

There are 130 commercial papaya growing farms across Australia. Majority of production occurs in Australia's North, throughout Queensland, with some growers in the Northern Territory and Western Australia.

For the year ending June 2017, 18,318 tonnes were produced; only 57 tonnes of this was exported, with 93% of these exports going to United Arab Emirates.

With Australian papaya exporting remaining small and in flux, the export price remains at the same level as domestic pricing, with an average cost of \$3.04 per kilogram.

### BEST MARKET PROSPECTS

Potential export markets by 2023 as outlined in the development strategy

1. **Qatar:** Rapidly growing market but price sensitive.
2. **Bahrain:** Rapidly growing market but price sensitive.
3. **New Zealand:** Small and declining market, but the opportunity exists to build programmed supply.
4. **UAE:** Small volume but attractive pricing if specific niches can be targeted.
5. **Hong Kong:** An open market that is easy to trade with, where a premium positioning could be built for Australian papaya.

### EXPORT BARRIERS

Several key market barriers exist; impacting the development of Australia's papaya export market. Including, but not limited to:

- Underdevelopment of industry export supply chain
- Demands of domestic industry market aren't being fully met
- Long distance travel is difficult due to soft skin of papayas
- Airfreight is necessary due to short, 2-week shelf life
- Export and domestic price are very similar
- High attention to detail is required in packing export orders
- Global competitiveness remains difficult with high Australian labour and compliance costs, and
- Global competitors' proximity and access to potential development markets.

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PAPAYA  
FUND

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# Minor use permits

**G**et the latest information on minor use permits in this extract from the Hort Innovation Papaya Fund 2017/18 Annual Report. The full document including all levy insights from across the financial year is available from [www.horticulture.com.au/fund-annual-report-portal](http://www.horticulture.com.au/fund-annual-report-portal).

While the use of pesticides and other chemicals in the horticulture industry is being modified through the increasing uptake of integrated pest management approaches, there remains a need for the strategic use of specific chemicals.

Chemical companies submit use

patterns for product label registrations to the Australian Pesticides and Veterinary Medicines Authority (APVMA) – however the papaya industry is generally provided with limited label registrations because of its ‘minor’ crop status in this area (meaning the chemical companies can consider the market size too small to generate adequate commercial returns, based on the R&D investment required). This is where minor use permits come into play. The APVMA’s national permit system adds some flexibility to the approval process and provides a legal framework that can allow access to products for minor use purposes.

## Permits in 2017/18

During the 2017/18 financial year, a successful application for new permit PER85397 was prepared by Hort Innovation and submitted to the APVMA, facilitated through the *Papaya industry minor use program* (PP16000).

The minor use program also saw the renewal of PER14098, PER14097 and PER13671, the latter renewal supported by data from the project *Generation of residue data for pesticide minor use permit applications in horticulture crops 2015/16* (ST15027).

Details for these permits can be found in the table below.

**Current permits:** Below is a list of minor use permits for the papaya industry, current as of September 1, 2018.

Permit ID	Description (chemical/crop/pest or use)	Original date of issue	Expiry date	Permit holder
PER12592	Chlorothalonil and difenoconazole / Papaya / Black spot and Brown spot	14-Aug-11	30-Jun-20	Growcom
PER13076 version 2	Propamocarb / Papaw or papaya (seedlings) / Damping off	05-Apr-12	31-Mar-22	Papaya Australia C/Hort Innovation
PER13158 version 9	Dimethoate / Specified citrus and tropical fruit commodities (inedible peel, post-harvest) / Various fruit fly species	06-Oct-11	06-Mar-19	Hort Innovation
PER13671 version 3	Beta-cyfluthrin (Bulldock 25 EC) / Papaya / Fruit-spotting bug and banana-spotting bug	28-Nov-12	28-Feb-23	Papaya Australia C/Hort Innovation
PER14098 version 2	Etoxazole (Paramite Selective Miticide) / Papaya / Two-spotted mite	03-Oct-13	30-Jun-23	Papaya Australia
PER14097 version 3	Abamectin and fenbutatin oxide / Papaya / Two-spotted mite	31-Oct-13	30-Jun-23	Papaya Australia
PER12450 version 6	Trichlorfon / Specified fruit crops / Fruit fly	06-Oct-11	31-Jan-21	Growcom
PER14417	Copper as hydroxide / Papaya / Papaya fruit rot	28-Feb-14	31-Mar-19	Papaya Australia C/Hort Innovation
PER14490 version 2	Metalaxyl-M (Ridomil Gold), metalaxyl (Zee-mil) + phosphorous acid / Papaya / Phytophthora root rot and Pythium	04-Apr-14	31-Mar-22	Papaya Australia C/Hort Innovation
PER13859	Dimethoate / Orchard clean-up – fruit fly host crops following harvest / Fruit fly	09-Feb-15	31-Jul-24	Growcom
PER80746	Ethephon / Papaya / Fruit de-greening	18-Aug-15	31-Aug-20	Papaya Australia
PER85397	Sulfoxaflor (Transform) / Lychee, mango, papaya, passionfruit (field grown) / Fruit-spotting bug and banana-spotting bug	09-Feb-15	31-Jul-24	Hort Innovation

All efforts have been made to provide the most current, complete and accurate information on these permits, however you should always confirm all details on the APVMA website at [portal.apvma.gov.au/permits](http://portal.apvma.gov.au/permits). Details of the conditions of use associated with these permits can also be found on the APVMA site.

Minor use permit updates are circulated in Hort Innovation’s *Growing Innovation* e-newsletter, which levy-paying members receive monthly. Not a member? Sign up for free at [www.horticulture.com.au/membership](http://www.horticulture.com.au/membership).

# Scientists aim to perfect pollination



Better understanding of papaya pollination is critical to prevent population deficits during challenging seasons.

**T**wo Brisbane-based scientists, Brian Cutting and Dr Lisa Evans, discuss their research on pollination; what we know and what we need to find out.

What is pollinating your papaya crop? Are you achieving optimal pollination or are some flowers under-pollinated? What can you do to make sure you are? You're not alone if you can't answer all these questions confidently. Crop pollination can be complicated and there are still many aspects of papaya pollination that are not well understood.

One outstanding question relates to the degree of honey bee pollination in papaya crops. Honey bees are the most readily available managed pollinator in Australia, and their populations are bolstered by feral colonies. However, previous research on the role and importance of honey bees in papaya pollination is conflicting. They are susceptible to many diseases and parasites which can reduce their availability. One such parasite is the varroa mite, which kills honey bee colonies unless treated. Australia is the last major growing region in the world without varroa, and when it arrives here the industries which rely on honey bee pollination will dramatically change.

Plant & Food Research Australia (PFRA) is working to ensure that Australian industries, like papaya, are ready for potential changes in



Using night vision video cameras, we can study the movement of hawk-moths on papaya flowers. On many farms nocturnal pollination is important for papaya production.

pollination services. We are part of the Hort Frontiers Pollination Fund; an initiative to optimise (and varroa-proof) pollination across multiple Australian cropping industries through project PH15000 'Strengthening and Enabling Effective Pollination for Australia'. We are two Brisbane-based scientists on the Pollination and Apiculture team, conducting research to better understand and improve pollination throughout Australia and New Zealand, with our primary focus being on horticulture in Queensland. Our work aims to prevent pollination deficits with landscape changes, and to develop strategies that maximise pollination in our current climate. With adequate pollination, growers can expect enhanced yields and improved fruit quality; producing fruits of larger size, better shape, and in some cases, better flavour.

Papaya pollination promises to be an interesting topic for future research, particularly looking at the role of honey

bees and stingless bees as pollinators, and how papayas quite uniquely benefit from nocturnal pollination by moths in many growing regions such as Australia. We have observed hawk-moths visiting flowers on QLD plantations, but many growers may not be aware of the quantity in their orchards because of their nocturnal habit and short period of activity. The impact of these insects on papaya production across regions and varieties is not yet fully understood. We aim to determine how substantially honey bees contribute to papaya pollination and to better understand moth pollination; investigating methods to enhance their population during challenging seasons.

Production methods can significantly influence pollination dynamics on a farm. Current information is largely collected from farms with varieties that have separate male and female plants. However, farms with hermaphroditic plants, that have both male and female flower parts in one plant, are likely to have completely different pollination requirements, and may not be dependent on insect pollination at all. Opportunity therefore lies in the ability to achieve higher and more consistent yields with certain management practices. Understanding the pollination differences of these plants is a priority for our research to guide best management strategies and minimise future risk of failure.

We are actively seeking growers to participate in this important research on pollination. If you'd like to get involved or share your insights, we can be contacted via email at:

[brian.cutting@plantandfood.co.nz](mailto:brian.cutting@plantandfood.co.nz) 

*Strengthening and Enabling Effective Pollination for Australia (PH15000) is funded by the Hort Frontiers Pollination Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from The New Zealand Institute for Plant and Food Research Limited and contributions from the Australian Government.*