

Australian

Issue: 50 | SEPTEMBER 2017

BANANAS

CONGRESS 2017— COOKING UP A STORM IN SYDNEY

BANANA BALL PAGE 24–25



LEANING INTO THE CHALLENGE Page 6

TOP GONG FOR PHILLIPS Page 10

NEW BANANA CULTIVARS Page 16



abgc.org.au





Knowledge grows

YaraMila grows
your business
with you

Introducing YaraMila™ 10-4-25

A compound granule that is ideal for supplying the nutritional requirements of bananas.

- Balanced nutrition in every granule supports better nutrient uptake and plant growth
- Well granulated fertiliser that has low dust, excellent handling and spreading characteristics for uniform application
- Rapid nutrient release to satisfy requirements of quick growing, high yielding crops



24

CONTENTS

Issue: 50 | SEPTEMBER 2017

REGULARS

| | |
|-----------------------|-------|
| Chair's comment..... | 4 |
| CEO's report..... | 5 |
| Marketing update..... | 36-37 |

INDUSTRY NEWS

| | |
|-------------------------------------|----|
| New Hort Code..... | 8 |
| Banana videos online..... | 8 |
| Top gong for Doug Phillips..... | 10 |
| Banana Freckle update..... | 10 |
| Hort Innovation projects..... | 20 |
| Bunchy Top Phase Three..... | 33 |
| Phosphorus fert management..... | 34 |
| Strategic Industry Development..... | 35 |

CONGRESS 2017

| | |
|--|-------|
| Sydney draws a crowd for Congress..... | 8 |
| The industry's positive marketing challenge..... | 21 |
| Congress day sessions..... | 22-23 |
| Banana Ball..... | 24-25 |
| Peter Kuruvita recipes..... | 38 |

BIOSECURITY

| | |
|---|---|
| Farm zoning..... | 7 |
| Feral pig management..... | 7 |
| Industry resilient in the face of Panama disease..... | 9 |

LOOKING TO THE FUTURE

| | |
|---------------------------------------|----|
| Next gen—looking outside the box..... | 11 |
| Carnarvon research tour..... | 13 |

TR4 RESEARCH

| | |
|---|----|
| New banana cultivars key to industry future..... | 16 |
| Prospects for niche market variety..... | 17 |
| Identifying TR4 resistance in seeded banana lines..... | 18 |
| Understanding movement of Fusarium within a banana plant..... | 19 |

BANANA FEATURE

| | |
|--|-------|
| Leaning in to the challenge—the MacKay Farming Group moving forward following TR4 detection..... | 6 |
| Breeding for disease resistance in bananas..... | 14-15 |

BANANA EVENTS

| | |
|-------------------------------------|-------|
| Australian Banana Packing Comp..... | 26-27 |
| Innisfail Show Banana Exhibit..... | 28-29 |
| Tully Show Banana Exhibit..... | 30-31 |
| Panama Open Day..... | 32-33 |

WATER QUALITY

| | |
|--|----|
| Wet Tropics—improving water quality..... | 12 |
|--|----|

EDITORIAL & ADVERTISING

Paula Doran
0408 424 194
paula@abgc.org.au

ART DIRECTION & DESIGN

theroom design studio
Level 1/82 Vulture Street, West End
07 3846 0140
www.theroom.com.au

PUBLISHER

Australian Banana
Growers' Council Inc.
ABN: 60 381 740 734

CHIEF EXECUTIVE OFFICER

Jim Pekin

INDUSTRY STRATEGY MANAGER

Michelle McKinlay

R&D MANAGER

Dr Rosie Godwin

EXECUTIVE OFFICER

Leanne Erakovic

ADVERTISING

Hilary Opray
info@abgc.org.au

BOARD OF DIRECTORS

Chairman

Stephen Lowe

Deputy Chairman

Ben Franklin

Treasurer

Stephen Spear

Directors

Jade Buchanan
Leon Collins
Tom Day
Paul Inderbitzin

ALL MAIL TO

PO Box 309
BRISBANE MARKET
QLD 4106

AUSTRALIAN BANANAS

Australian Bananas is published three times a year by the Australian Banana Growers' Council Inc. as manager of the Banana Industry Communications Project. This project is funded by Horticulture Innovation Australia (Hort Innovation) using the banana levy and funds from the Australian Government.

DISCLAIMER

Horticulture Innovation Australia (Hort Innovation) and ABGC make no representations and expressly disclaim all warranties (to the extent permitted by law) about the accuracy, completeness, or currency of information in this magazine. Users of this material should take independent action to confirm any information in this magazine before relying on it in any way. Reliance on any information provided by Hort Innovation and ABGC is entirely at your own risk. Hort Innovation and ABGC are not responsible for, and will not be liable for, any loss, damage, claim, expense, cost (including legal costs) or other liability arising in any way (including from Hort Innovation's and ABGC's or any other person's negligence or otherwise) from your use or non-use of the magazine, or from reliance on information contained in the magazine or that Hort Innovation and ABGC provide to you by any other means.



6



10



26



CHAIR'S OVERVIEW

Stephen Lowe, Chairman's Column



The confirmation of a second positive Panama TR4 result in the Tully Valley is obviously disappointing, to say the least.

However, it is far too early for industry to consider giving up on containing this insidious disease, by assuming it will become endemic.

I have every confidence in our regime of on-farm biosecurity that has been implemented in the past two years. And, in the case of the MacKay family who have had the misfortune to discover the latest incursion, their biosecurity practices are of the highest level.

I cannot stress enough that on-farm biosecurity is our best tool for containing this disease. It buys us valuable time while research continues across the world into finding varieties resistant to TR4.

Government funding continues to be funnelled into varietal trials in Australia and the ABGC is committed to continuing to champion this cause.

It is also important to note that—as with the first detection—suspect plants from this second outbreak were voluntarily reported to authorities by the grower. I speak on behalf of other growers and industry at large in thanking them for their pro-activeness, as reporting suspect plants as soon as possible, is another key to containing the spread of this fungus.

FERAL PIGS

A major vector of TR4 is feral pigs and I would urge all growers to up the ante when it comes to controlling pig populations in and around their farms.

The ABGC has requested urgent Queensland Government funding so that a co-ordinated feral pig management program can commence quickly.

Currently, feral pig management relies on individual landholders to independently trap pigs and I would urge all growers to do everything they can to stop feral pig movement onto and around their farms.

NEXT GEN GROUP

I would like to thank and congratulate the enthusiastic group of young growers who attended the Next Gen tour in Sydney, pre-Congress.

It was great to see a group of dedicated growers with open minds and visionary views gather to share their positive thoughts and ideas for the future. (The only disappointing factor was that there wasn't more female growers represented in this group).

We all know how difficult it is to take time away from your business and it was heartening to see our next generation keen to learn and be involved in helping to mould the future of our industry.

It was particularly exciting to see the potential that technology has to offer growers during a visit to the Centre for Field Robotics at the University of Sydney, which I was fortunate to attend.

CONGRESS 2017

On the subject of Congress, what a fantastic event it was this year!

The calibre of speakers and presentations was extremely high, possibly the best ever. (If you weren't able to make it, we have some of the presentations and much of the colour in photos, featured in this magazine).

The biennial Congress provides an invaluable opportunity for growers to gather socially, network, be inspired, discuss marketing opportunities and hear the latest in research and development.

It is important that the ABGC gets feedback from all growers, to ensure the next Congress is bigger and better than any other.

From those who attended we'd love to hear what you liked and what you didn't like. And if you didn't attend, we'd like to know why and what would make you attend next time. Feedback can be emailed to info@abgc.org.au. Highlight videos from each day at Congress can also be found on the ABGC's Facebook page: www.facebook.com/Australian-Banana-Growers-Council-242290795822836/.

JUST ADD WATER AND GO

CROP MANAGEMENT TECHNOLOGY AT THE TOUCH OF A BUTTON

Netafim NMR-RAC will turn your irrigation system into a state of the art crop management solution.

Suitable for new and existing systems, Will work anywhere there is 3G connection. Smartphone and tablet compatible.

NETAFIM
GROW MORE WITH LESS

PROACTIVE APPROACH

Jim Pekin, CEO's Column



ABGC was proactive in regard to having growers plan to address being compliant with the TR4 legislation. We decided to put Shane Dullahide on a six-week contract to help volunteer growers plan

for the regulatory requirements for a TR4-infested farm, in case their farms contracted TR4 in the future. He started this work on May 12, the same day as a well-run DAF TR4 Field Day.

His report and his generic TR4 Planning template that can be used for all Queensland banana growers is on ABGC's website. This is even more useful now! (See story below).

At the time of writing (July 31), a second farm in the Tully area had been confirmed as having a plant with Panama Tropical Race 4 (TR4). The ABGC has been actively informing growers of developments via e-bulletins and the media. This week we will hold meetings in Tully, Innisfail and Mareeba to ensure everyone involved in the industry is up-to-date and given the opportunity to ask questions and comment.

Sometimes when incursions occur, there is a sensational reaction, particularly from some

sections of the media. It is an excellent sign that the banana industry and the regional communities it supports have not reacted this way. Many readers will recall that when Ben Franklin (ABGC's Deputy Chair) opened this year's Banana Industry Congress he noted: "Our industry certainly has a history of looking adversity straight in the eye and taking it head on." That history continues to be made.

IN RESPONSE TO THE SECOND TR4 INCURSION, ABGC'S MAIN MESSAGES CONTINUE TO BE:

- This detection is on a small, isolated and confined patch on one paddock of the farm. The site has been secured.
- The owners of this farm have put in place measures so that the fungus is contained to this farm.
- Bananas are safe to eat, because it is a disease of the plant, not of the fruit—so all bananas sold are safe and as nutritious as ever, for long lasting energy.
- ABGC's focus is on containment. That is, growers are urged to continue or ramp up their on-farm biosecurity measures, by:
 - Removing all plant material and soil from machinery and footwear before they are brought onto farms.

- Establishing distinct exclusion zones on each farm, including clean zones.
- Ensure the use of clean planting material.
- Not sharing farm machinery with other growers.
- Managing feral pigs.

ABGC thanks the Queensland Government for continuing the funding and management of the TR4 Program, through Biosecurity Queensland, which is mostly about regulatory compliance, surveillance and diagnostics. We have also formally and verbally requested of the Queensland Government that it commence a comprehensive and coordinated feral pig management program in the Wet Tropics.

Finally, I am sure everyone involved appreciates the efforts of the family at the centre of this second detection. The emotional stress of a confirmed detection is massive. To their credit, the MacKay's have quickly transitioned to a situation where they are compliant with the requirements of the Biosecurity Regulation and the Biosecurity Manual. The day the detection was confirmed (July 26) they asked ABGC to assure growers that Biosecurity Queensland (BQ) has world class protocols and that they can be trusted.

ABGC has commended them on their pro-active biosecurity and approach to managing this incursion.

TR4 ON FARM PLANNING RESOURCE

In May and June, the Australian Banana Growers' Council (ABGC) provided assistance to interested growers to prepare their own farm Biosecurity Management Plan via pathologist Shane Dullahide.

Shane assisted growers to develop individual plans tailored to the operations of their banana farms. The plans covered risk minimisation activities that meet conditions required by the Biosecurity Manual.

He also developed a Biosecurity Plan template, based on operational tasks for all growers at risk to do.

Biosecurity Queensland (BQ) requires the owners of TR4 infested land to develop a Farm Biosecurity Management Plan to document how they will abide by the regulatory requirements. This plan is a requirement for a grower to maintain banana sales and fruit movement to market.

Having a plan in place before a farm becomes infested with TR4 will have two

main benefits:

If and when another farm becomes infested with TR4, the farm operators or owners will be ready to enact their plan. Should the worst happen, they will be able to make decisions quickly about ongoing farm operations. This is preferable than trying to sort this out under stressful conditions that occur after such news.

- It will highlight risk pathways which will help farms with biosecurity measures, thereby reducing risks of TR4 infection or spread.

The preparation of these plans is not a trivial undertaking. It is therefore good sense for these plans to be in place before TR4 is detected on a farm.

Shane's report and Biosecurity Plan template are available for view at the following link www.abgc.org.au/2017/07/07/new-report-managing-a-farm-with-tr4/.

LEANING IN TO THE CHALLENGE

For more than two years, the Australian banana industry has held its collective breath, hoping heavily that Panama Tropical Race 4 would remain at bay, following Queensland's first TR4 detection in March 2015.

But after confirmation of a second farm incursion in the far north's Tully Valley, the new challenge has been accompanied by a renewed sense of conviction in continuing the industry's biosecurity efforts—thanks in no small part to the family at the centre of the latest outbreak, who are confident of winning the war against this latest threat.



By Sonia Campbell

As a pioneering family that has farmed bananas in Queensland for more than 70 years, the MacKay Farming Group has had its fair share of knocks along the way.

But you don't become one of the nation's largest and most successful primary producers without a steely resilience and a fighting spirit to land some knockout punches of your own.

It could be said that the MacKays will need to draw on past experiences to overcome their latest challenge, following confirmation that a small, isolated section on one of their Tully Valley properties, had tested positive to Panama Tropical Race 4.

But, as an industry leader in establishing world-class biosecurity practices across their extensive banana farming network, it's a battle they had been armed and ready for, long before now.

"It's not the first kick in the guts we've had and it won't be the last," a defiant, yet upbeat Cameron MacKay tells.

"We're farmers, that's how it works."

Brother Daniel Mackay adds, "it's unfortunate, but it's happened, and we have to deal with it and do the best we possibly can. But everyone can be assured that we are doing everything possible to contain any spread from this isolated pocket.

"Without doubt, our biosecurity practices have helped us deal with the situation better. That has been key. Without it, I don't think we would have been able to continue the way that we have. It's a big part of going forward."

Cameron and Daniel, along with their brother Stephen and their cousins Barrie and Gavin, are third generation banana growers and manage the family's MacKay Farming operations.

They are a tight-knit entity and together they are a formidable farming force. They are hard-working, humble and all very much dedicated to continuing a family legacy, founded by their grandfather Stanley MacKay, and built-on by their equally progressive and visionary fathers, John and Robert.

Stanley planted his first banana crop in North Queensland in 1945, going on to pioneer the banana industry across Northern Australia. Today, the family is the country's largest banana producer.

When Panama TR4 was first detected in the Tully Valley in March 2015, the family quickly embraced tightened biosecurity measures as part of their farming practise.

Almost immediately, they set about establishing a sophisticated biosecurity plan, based on a colour-coded zonal system, establishing red, green and yellow zones on all of their farms.

The system has since been incorporated into biosecurity practices championed by Biosecurity Queensland and the Australian Banana Growers' Council, including establishing 'clean' zones—taking in farming and packing areas—that are separated from areas where vehicles, equipment and people enter and leave properties.

The MacKays also introduced colour-coded gumboots for different zones and fitted each farm with the latest footbaths, wash down facilities and chemical dips.

"Most people have enacted their biosecurity plan and they just need to keep being vigilant with it, because that has been our saving grace, that we've got a good system in place," Stephen said. "And, we have confidence in our industry."

Barrie agrees, "with all the biosecurity measures that we have already put in place, it has made it a lot easier."

"We've been a family farming business for 71 years

and I believe that we will be farming bananas well into the future. We have confidence in holding back this disease where it is and managing it and moving forward and growing bananas for a very long time to come."

Cameron said establishing an effective biosecurity system well in advance of a TR4 outbreak was key to containing the soil-borne disease.

"Biosecurity is a culture, it's not something that you just go and start tomorrow, it's a culture that builds and growers need to start fostering that culture in their businesses," he said.

"They don't want to be walking in one day and have to do it starting from scratch, they want to have their biosecurity systems well in place before they have to deal with an outbreak."

Gavin added that having effective biosecurity systems in place today, meant the industry was much better placed to contain TR4, than it was in 2015.

"Two years on, a lot of the industry is much more prepared for something like this. But you really do have to have those separated zones on your farm to limit the cross contamination, that way you can prepare yourself the best you can for anything that may happen," he said.

The MacKay family said the support they had received from staff and assistance offered from other growers had been overwhelming and they were thankful for the generous offerings.

"A lot of our staff and the people that work for us have done an awesome job to get everything happening and we owe a big thanks to those guys," Cameron said.

"Also, support from other growers. We have had phone calls and texts offering support. You don't realise how tight-knit the banana growing community is until something like this happens."

FARM ZONING, RESTRICT MOVEMENT ON YOUR FARM



Farm zoning can be a cost effective means to controlling the movement of people, vehicles and machinery both between zones and within zones. Three zones are typically used:

- An exclusion zone for all non-essential vehicles such as visitor and staff car parking, typically located near the farm entrance.
- A separation or 'clean' zone which is a roadway for essential vehicles that need to come on farm. For example, fruit pick-up trucks, fertiliser or fuel delivery or waste pick up.

- A farming activity or 'dirty zone' where farm vehicles, machinery and equipment operate. Vehicles, machinery, equipment or tools should not enter or exit this area without appropriate decontamination.

Biosecurity Queensland has produced a resource "Wash-down designs to combat Panama disease tropical race 4" for banana growers in Far North Queensland. A copy has been mailed to every grower in the region. If you don't have a copy phone 13 25 23 and we'll send you one or you can download a copy off the Biosecurity Queensland website www.biosecurity.qld.gov.au.

FERAL PIGS AND PANAMA DISEASE

As soon as feral pigs, or feral pig activity is noticed on your land, it's time to start a trapping program.

TR4 can be easily spread by animals when infected soil sticks to their feet and fur. Feral pigs are a particular concern as they habitually wallow in mud and are attracted to banana farms, as the farm can provide a reliable food source.

Feral pigs don't pay heed to boundaries and will travel across numerous farms in search of food and water, exposing growers to potential spread of pests and disease.

Biosecurity Queensland suggests co-ordinating trapping programs with your neighbours. Cassowary Coast Regional Council has pig traps and hog hoppers for loan and, if your farm is adjacent to a national park, the Queensland Parks and Wildlife Service can assist with wildlife friendly traps and expert advice.

The Panama TR4 Program, in collaboration with key agencies, has published Trapping Feral Pigs on the Cassowary Coast: a practical guide for banana growers farming in the presence of Panama disease tropical race 4. The guide has been distributed to all banana growers in Far North Queensland. Download a copy from the website www.biosecurity.qld.gov.au under 'Panama disease' or call 13 25 23.



SYDNEY DRAWS A CROWD FOR CONGRESS



By Paula Doran

The Australian Banana Industry Congress for 2017 has come and gone, and what an incredible three days of inspiration, information and industry updates.

The Sydney event was based at the Sheraton on the Park, and attracted 353 delegates who enjoyed a three-day program which saw sportsman and raconteur Peter FitzSimons open the batting, and led to left-of-centre presentations from the likes of futurist Rose Herceg, inspired reality checks by former bullrider and farmer Rob Cook, to the all-important international science research on TR4.

The program included practical information including the dominance of bananas in marketing, the need to think outside the square in terms of creating brand differentiation, and really taking care of your work-life-balance focusing on well-being, rather than just productivity.

Coinciding with the State of Origin game once again (as was the case in Melbourne 2015), Congress proved a great opportunity to get off-farm and enjoy social time; and while the Maroon's win was undoubtedly a good start, the Banana Ball was certainly the highlight in terms of glamorous fun—boosted by comedian Anh Do.

ABGC Board member, and Congress organising committee Chair, Ben Franklin acknowledged the hard work undertaken behind the scenes which again created a successful event, noting the high level of speakers as a particular highlight. "We had great feedback on the calibre of speakers chosen for the Congress and the balance of topics based on our three themes of sustainability, resilience and innovation.

"Some of the growers and industry stakeholders I have spoken to since Congress were very complimentary on the way that the event ran and the way that the venue was able to meet one of our key requirements of having exhibition space and the plenary room in close proximity," Mr Franklin said.



Keynote speaker: Peter FitzSimons opens Congress with an energetic call to the industry to perform at its best.

"Certainly the challenging market conditions for bananas for a prolonged time leading up to the event had an impact on numbers, but for those able to get there, it was well worth the trip," he said.

"There is a really strong group of people behind the event, and the support we receive from the industry in terms of sponsorship and those who commit their time to coming and being a part of it, it's really heartening to see."

** For full image galleries of both the day session and the Banana Ball see [pages 22–25](#).*

** Or for stories on some of the scientific research presented by international speakers at Congress, see our international research stories on [pages 14–16](#).*

NEW HORT CODE

A new Horticulture Code of Conduct—regulating trade between growers and traders—came into effect on April 1, 2017.

The code replaces the former Horticulture Code established by the Trade Practices (Horticulture Code of Conduct) Regulations 2006.

The code imposes obligations on both traders and growers, when buying and selling horticulture produce, and provides for substantial penalties if the code is breached.

All growers have been urged to ensure they comply with the new code. Full details can be found on the Australian Competition and Consumer Commission website www.accc.gov.au/business/industry-codes/horticulture-code-of-conduct.

BANANA VIDEOS ONLINE

Everything we love about the Australian banana industry has been celebrated in a video which officially opened the Australian Banana Industry Congress in June.

The video was uploaded to the Australian Banana Growers' Council Facebook page and has had more than 7,300 views. It can also be viewed on the ABGC website, www.abgc.org.au and YouTube via the link <https://www.youtube.com/watch?v=kLXEAJ0gN84>.

A great video of Far North Queensland banana grower Matthew Abbott of Rabbit Organics, talking about his Nuffield Scholarship experience, was also played at Congress. It is also on the ABGC website, ABGC Facebook page and YouTube at <https://www.youtube.com/watch?v=eG1Tykw0u2g&t=14s>.

INDUSTRY RESILIENT IN FACE OF PANAMA DISEASE

By Deanna Belbin, Biosecurity Queensland

The discovery of a suspect second case of Panama disease Tropical Race 4 (TR4) on a property in the Tully Valley was not ideal, but was not unexpected.

Panama TR4 acting program leader Rhiannon Evans said that although Panama disease was extremely difficult to manage, Biosecurity Queensland was committed to working with industry to tackle this current challenge.

"We do not intend to walk away from this industry. We will continue to work closely with everyone involved to safeguard the region's biggest employer and Australia's largest horticultural crop," Ms Evans said.

"Our main priority is to ensure that the affected business will continue to operate with as little disruption as possible, while not creating any risk for other producers in the region."

Ms Evans said experience gained from the initial detection held the industry in good stead.

"Since the disease was first discovered over two and half years ago, we now know more about it and are more confident in our approach," she said.

"Biosecurity Queensland has implemented rigorous biosecurity protocols underpinned by world class scientific research and we will continue with our current research and development program to support the industry in the long-term.

"The Queensland banana industry is well placed and confident in their own ability to implement biosecurity measures to mitigate the risk of spread of this disease.

"We will continue to collaborate with industry to develop other measures that help protect farms into the future."

Ms Evans said in light of the suspect second detection, now was the time for growers to assess current on-farm biosecurity plans.

"There are many growers in the region investing in prevention of the disease at their property boundaries," she said.

"They've had time to prepare and implement their on-farm biosecurity plans, they have an understanding of the disease and are proactively protecting their farms.

"Now may be a prudent time to take stock of current procedures, check if they are working effectively and see if any areas can be improved."

Ms Evans stressed the importance of washing and decontaminating farm vehicles, machinery and equipment on farm entry and exit as part of an effective farm biosecurity plan.

"It takes just one fungal spore to infect a banana plant. The disease is not eradicable and therefore, cannot be cured by any known chemical or biological means. It can be easily transported in infected plant material, soil and water," she said.

"Follow the come clean, leave clean guidelines to minimise the risk of transporting soil onto and off your farm, and onto public roads and easements.

"Check disinfectant levels are sufficient and manage waste water appropriately.

"Implementing farm biosecurity needn't be expensive and new layers of biosecurity can be added as more resources become available."

Ms Evans said Biosecurity Queensland had many resources available for



growers who would like information regarding effective on-farm biosecurity measures.

"Growers can phone our public information number on 13 25 23 or visit the Biosecurity Queensland website for more information."

Ms Evans reminded the community that Panama disease tropical race 4 was not harmful to humans and does not affect the fruit.

"The fungus only affects the health of the plant and its ability to produce fruit—bananas are still good to eat so support our local industry and grab some bananas," she said.

PROTECT YOUR FARM FROM PANAMA DISEASE

Cleaning and disinfecting machinery, footwear, and equipment entering or exiting production areas of banana farms can reduce the risk of disease spread. For decontamination to be effective, the following three steps are recommended.

- **Clean**—with a detergent, use a tool or brush to remove all soil and or plant material.
- **Rinse**—using clean water.
- **Disinfect**—with a registered product containing quaternary ammonium (QA) compounds containing 12% (120g/L) didecyl dimethyl ammonium chloride and used as per the product label.

If you're concerned about long term repeated exposure of QA compounds on vehicles, machinery, equipment and footwear consider an additional final rinse step.

This disinfection process should apply to all vehicles, machinery and equipment that exit and enter a banana farm. Industry contractors such as agronomists and bell injectors, produce transport companies, delivery vehicles and service and utility providers should all be aware of, and comply with, your farm's biosecurity plan.

Ms Evans said to follow the come clean, leave clean guidelines to minimise the risk of transporting soil onto public roads and easements.

"Mud deposited on public roads from banana farm vehicles and machinery is a real concern for many growers," she said.

"Consider other growers and keep your soil on your property. Clean and disinfect your vehicles and machinery upon farm entry and exit if you must cross a public road, railway line or easement as part of your farming operations."

TOP GONG FOR FORMER ABGC CHAIR

Former Australian Banana Growers' Council (ABGC) chair Doug Phillips received the highest accolade from the Australian banana industry during the 2017 Congress Banana Ball.

Mr Phillips was the sole recipient of the ABGC Award of Honour, in recognition of his outstanding contribution to the industry during his six years on the ABGC board, five of those as Chair.

Sitting ABGC Chair Stephen Lowe presented Mr Phillips with his award, thanking his predecessor for his dedication and service to the industry at large.

Mr Lowe noted that during Mr Phillips' time on the ABGC board there had been many industry challenges including Banana Freckle, banana prices, concerns about water quality to the Great Barrier Reef, severe weather events, the review of Horticulture Australia Limited (HAL) and the need for a national horticultural advocacy body.

However, he said, arguably the greatest challenge had been the detection of Panama TR4 on a property in Tully in March 2015.

"Doug's strong leadership in the months and years that followed the initial detection—against a wave of industry uncertainty and fear—was unwavering to say the least," Mr Lowe said.

"As well as addressing constant media requests, Doug ensured industry was always well informed, he consistently liaised with Biosecurity Queensland, senior government officials and scientists in the effort to contain TR4, and made successful submissions to government for assistance and grants."

Another significant achievement for the former Chair was his role in establishing an emergency plant pest response (EPPR) levy in July 2013, to fund an eradication program for Banana Freckle in the Northern Territory.

** For more photos of the Banana Ball, go to [pages 24 & 25](#).*



ABGC Chair Stephen Lowe (right) presented former ABGC Chair Doug Phillips with an ABGC Award of Honour at the Congress Banana Ball.

BANANA FRECKLE UPDATE

By Dr Rosie Godwin

The National Banana Freckle Eradication program (NBFEP) recently entered the final phase of the eradication program: Phase four—Assessment of proof of freedom.

Banana Freckle (*Phyllosticta cavendishii*) was detected in Northern Territory (NT) in 2013 and the current national response program has been in progress since October 2014.

Phase One involved the destruction of 500,000 plants from 9,500 properties within prescribed zones. This was followed by Phase Two the host free period, Phase Three involved the controlled reintroduction of banana hosts (sentinel plants) under permit and ongoing monitoring over 12 months. To date there have been no further detections of banana freckle.

Phase Four began in May this year and is aimed at providing a statistically high level of confidence that banana freckle has successfully been eradicated from the NT. It will involve additional monitoring

until April 2018 including additional inspections conducted during the next wet season on more than 300 properties that were either previously infected with banana freckle or in close proximity to infested farms.

If there are no further detections of the disease during this time Australia will be able to prepare a case to declare that it is free of Banana Freckle.

In July 2017, the NT abolished quarantine zones and lifted internal movement controls so people are able to purchase, grow, move and sell banana plants within the NT. However, the Australian Banana Growers' Council (ABGC) and NBFEP recommend that people should continue to use good biosecurity practises including using certified clean planting material and avoiding the unnecessary movement or sharing of plants. Interstate movement and access restrictions however are still in place and require a permit.

The response which is estimated to cost \$26 million has been of major importance to the protection of Australia's \$600 million commercial banana

industry and people whose livelihoods depend upon it.

The eradication program has involved a considerable effort and support from the NT which has led the program as well as the national industry who are contributing around 50 per cent of the shared cost of the program.

The Freckle Eradication Program remains on track to achieve eradication in 2017/18. Collection of the Emergency Plant Pest Response (EPPR) levy which is funding the Banana industry's contribution to the Eradication Response since 2015 will cease when no longer required. This is estimated to be at the end of 2020.

Good biosecurity is everyone's responsibility so banana growers, householders and banana production nurseries, especially in northern Australia, are reminded to check their banana plants and report any signs of banana freckle to the Exotic Plant Pest Hotline on 1800 084 881. If you live in the Northern Territory, you can call the Banana Freckle Hotline on 1800 771 163.

NEXT GENERATION LOOK OUTSIDE THE BOX



By Tegan Kukulies, DAF

Over the past year the young banana growers which form the NextGen group have been looking at other horticultural industries and manufacturing to draw inspiration and drive innovation in their businesses. Key areas that brought the greatest opportunity to learn from included labour efficiency, packing shed productivity, and environmental impacts.

Interest in looking at different production systems was first sparked when the group decided to visit production in their 'own backyard', being coffee, blueberries and papaya on the Tablelands.

Late last year some of the NextGen group travelled to the Bowen/Gumlu area to see how large operations grow, harvest and pack melons and vegetables and also talk to an innovative young mango grower. Growers who attended the trip were impressed with how high-tech and automated the shed systems were. They were also interested in the mechanised harvesting of some crops.

Innisfail grower Matt Abbott said "I was impressed by the state-of-the art technology and level of automation implemented in the tomato packing shed. The shed had two computerised colour grading systems that automatically graded each tomato on colour and size."

Prior to the commencement of the recent Australian Banana Industry Congress in Sydney there was interest from growers to use the trip to again broaden their knowledge of other industries. The four stop tour included visits to Orora's Botany Paper Mill, The Centre for Field Robotics at the University of Sydney, a pre-packaging facility owned by integrated business Hydro Produce and Integrated Plastics' extrusion plant.

Lakeland grower Paul Inderbitzin said "I really enjoyed seeing the overall process of cardboard recycling at the Orora's paper mill and was impressed that they use 100 per cent recycled material.

Paul was also impressed with the visit to Hydro produce, noting the businesses focus on delivering quality product to customers.

Tablelands grower Andrew Serra commented on that fact that "the overall challenges that you face as a business are the same—such as energy savings..."

"I was also impressed to see the future of robotics and tech in bananas and felt that targeted work in bananas would be interesting," Andrew said.

Other growers agreed it would be good to establish closer relationships with people working in the tech space to start more banana specific work.

Colin Singh, a grower from Cudgen in New South Wales commented on how interesting it was to see and understand how bunch covers were made at the plastic extrusion plant.



The NextGen group would sincerely like to thank all the businesses and people who have generously given up their time to facilitate the group's visits. The NextGen banana grower's initiative continues to be a strategic levy investment under the Hort Innovation Banana Fund. It is part of the National Banana Development and Extension Program (BA16007), funded by Hort Innovation using the banana research and development levy with co-investment from the Queensland Department of Agriculture and Fisheries (DAF) and contributions from the Australian Government.

NextGen encourages young growers to become more involved in the future of the banana industry and inspires them to 'think outside the box' and try different practices on their farms. Growers who would like to get involved in the group should contact Tegan Kukulies from the Department of Agriculture and Fisheries on (07) 4220 4152.

**Hort
Innovation**
Strategic levy investment

**BANANA
FUND**

WET TROPICS—COLLABORATION THE KEY TO IMPROVING WATER

With an increasing amount of work being done on water quality in the Wet Tropics, the ABGC's Industry Strategy Manager, Michelle McKinlay looks at the collaborative approach underway that will spark future improvements.

There is a lot of water quality activity happening in the Wet Tropics—and it isn't likely to stop any time soon.

The Australian Banana Growers' Council (ABGC), on behalf of banana growers, has been involved in designing the Wet Tropics Major Integrated Project (MIP) that will see significant Queensland Government funding invested in the region to deliver water quality improvements. There is a consortium of over 40 organisations covering agricultural, community, science and NRM interests as well as community members that are designing this reef water quality project—that will be built up from the “grass roots”.

The design incorporates the 550 water quality improvement ideas that were generated by 300 community and industry representatives during the four workshops held in Tully and Innisfail earlier this year.

It has been a massive task to collate the ideas and design strategies that will turn ideas into solutions. The MIP project is a unique opportunity for the local community to demonstrate water quality leadership and show that local participation, collaboration and knowledge is an effective combination that will deliver very visible results.

One of the strengths of the project is that it has a truly integrated approach to improving water quality. It is the first time that a government has allocated a significant amount of money to look at the mix of potential contributors to poor water quality—agricultural, industrial, urban development, natural erosion—and then giving the community the responsibility for designing the fix.

INVESTING IN HOT SPOTS

In 2016, the Great Barrier Reef Water Science Taskforce, an independent advisory body,

recommended that the Queensland Government stimulate a transformational approach to water quality improvements on the Great Barrier Reef. To do this the taskforce recommended the Queensland Government should invest significant funding in two “hot spots” known for their high contribution of sediment and nutrients that impact the water quality of the Great Barrier Reef.

It further recommended that an integrated mix of activities focus on the water quality and production benefits that can be derived from improved collaborative extension, increased monitoring, trialling innovation and improving land management—to name but a few. The Wet Tropics and the Burdekin were selected to trial this approach initially with the aim that the learnings could be applied to other regions in close proximity to the Reef over time.

While it sounds like a very sensible, collaborative approach, it hasn't been as well resourced or done to this scale before. That is what makes this project so exciting.

This project is a bit of a risk for the Queensland Government because it involves a lot of money being directed into specific locations and there is so much domestic and international interest in the health of the Reef.

The Government has a lot riding on the success of the project. It is very positive that the government is trusting the industries and communities to deliver measurable improvements.

The design phase of the project has just ended and the roll out of the implementation plan for the first year is about to start.

WHAT'S AHEAD?

Over the next three years, the MIP will invest up to \$4.6 million to install 20 different treatments including bioreactors, wetlands, high efficiency sediment basins and riparian buffer zones.

It will trial and monitor the effectiveness of these repair and treatment systems as potential methods for reducing pollutant loads entering the Great

Barrier Reef in the Wet Tropics.

These will be delivered in collaboration with farmers and landholders in optimal locations.

The project will also accelerate practice change by investing up to \$4.7 million to increase the delivery of extension services, performance-based incentives and technical support for landholders.

It will invest nearly \$3 million over three years to design and deliver local scale water monitoring across 14 new sites. Working closely with farmers and the community, it will ensure industry and community have ownership and oversight, and that land managers receive rapid, timely, targeted water quality information.

Grower feedback has been ‘show me that it's my problem and I will solve it’, and the MIP will help build connections between science and farmers on the impacts and causes of reduced water quality.

There is also a focus on non-agricultural improvements with the MIP investing up to \$1.5 million over three years. And finally there will be just over \$500,000 in funding that will explore innovative financing and investment opportunities with underpinning principles similar to the current carbon credit schemes. If such a scheme can be successfully implemented, it could see banana growers being paid to change (and then maintain) some of their land management practices. This type of system is being used in many countries and is particularly effective in repairing environmental damage.

Rob Mayers, ABGC Extension Officer is also a member of the Panel overseeing this project. “We're on track to deliver a great MIP, and going forward I think growers will embrace water quality improvements not only on their own farms but on the landscape around them,” he said.

The residents of the Wet Tropics region now have the opportunity to lead the challenge to improve the water quality of the Great Barrier Reef. If you want to get involved in the ‘pollution solution’, call Rob Mayers on 0447 000 203 or Michelle McKinlay on 0427 987 499.

“WHILE IT SOUNDS LIKE A VERY SENSIBLE, COLLABORATIVE APPROACH, IT HASN'T BEEN AS WELL RESOURCED OR DONE TO THIS SCALE BEFORE. THAT IS WHAT MAKES THIS PROJECT SO EXCITING.” — MICHELLE MCKINLAY

CARNARVON EAST COAST RESEARCH TOUR



Valerie, Annie and Tegan at the South Johnstone Research Station.

By Sonia Campbell

Carnarvon's banana growing region has remained relatively free of major pest and disease incursions.

However, this may not always be the case and is the reason that education, improved biosecurity and renewed varietal trials, are all on the horizon for the West Australian growing district.

Preparation for potential disease incursions in the future was the focus of a recent east coast tour by Annie Van Blommestein, an agronomist with the Carnarvon Growers' Association, and Valerie Shrubbs, a development officer with the Department of Primary Industry and Regional Development.

The pair spent several days touring Queensland and New South Wales learning more about nematode identification, varietal trials and biosecurity practices as part of the new improved plant protection for the banana industry project.

First stop was Brisbane's Ecoscience Precinct where they spent two days looking at nematode identification and root dissection. Nematodes are one of Carnarvon's biggest pests, not only for bananas but for most of the region's 1500ha growing district.

"There are two nematodes that are issues for us, one is spiral, one is root knot, and there is a third that has cropped up in the past in Carnarvon, but hasn't been seen again," Ms Shrubbs said.

"At the (Ecoscience's) lab they showed us how to identify this third nematode, so that if it does crop up again we can ID it."

Their tour also included a visit to the Duranbah trial site in NSW, where they were shown current varietal trials, as well as nematode and weed sampling.

They also visited the Department of Agriculture and Fisheries South Johnstone Research Station in Far North Queensland and toured a local banana farm.

They said biosecurity and varietal trials were two areas they would develop further with Carnarvon growers on their return. "We will put it to our growers to see if they are interested in doing some variety trial work. Potentially what we'd look at is cold tolerance, the resistance to TR4 and Panama Race 1, and then market differentiation," Ms Shrubbs said.

BANANA SCHOLAR RATES EXPERIENCE

University of Queensland Bachelor of Applied Science student Helen Garate was the 2016 Mort Johnston Professional Development Scholarship recipient. Australian Banana Magazine asked the horticulture major what she got out of the innovative program.

HOW DID YOU COME TO APPLY FOR THE MORT JOHNSTON SCHOLARSHIP?

I was studying an undergraduate degree at University of Queensland and discovered the Australian Banana Growers' Council offered the Mort Johnston Scholarship, which included a \$5000 bursary and two weeks of work experience on a banana farm.

WHERE DID YOU UNDERTAKE THIS WORK EXPERIENCE?

At Serra Farming in Tolga. I gained hands on experience of banana growing through Andrew Serra, including pests and disease management, irrigation management techniques and packing and marketing aspects.

HOW MUCH OF A BENEFIT FOR YOU WAS THE ABILITY TO GET ON FARM AND SEE HOW THE INDUSTRY WORKED?

Being able to get hands on experience was very beneficial since the theory learnt in my university lectures could be put into practice. I have grown up on a banana farm and worked for many years previously on banana farms so it was beneficial to compare the industry then and now and see how it has progressed and developed. If you work on a farm you see things from the grower's point of view instead of from the consumer's. This gives insight into the needs and problems facing the farmer with cost of production and outputs and inputs, rather than looking at the industry from the view of the supply chain. The knowledge gained has allowed me to see where I can put theoretical knowledge into practice and where there are areas in the banana industry that could benefit from this theoretical knowledge.

HOW WILL YOU USE THE INSIGHTS YOU DISCOVERED THROUGH THE SCHOLARSHIP IN THE FUTURE?

Through this scholarship I have gained insight into some of the problems the industry faces in quality control, water and fertiliser use and efficiency, and disease control. There is a wide scope for research into disease control and development of new varieties. I am interested in further research into improving the resistance of bananas towards diseases such as Panama disease and Yellow Sigatoka with companion plants, soil bacteria and also breeding of more resistant varieties. My insights into fertigation and soil erosion, nutrient runoff will be useful in my further studies and also hopefully in future work to reduce nutrient runoff and increase water and nutrient efficiency on farms.

WOULD YOU ENCOURAGE OTHERS TO APPLY FOR THE SCHOLARSHIP? IF SO, WHY?

Yes, definitely. Degrees in agriculture are based in south-east Queensland. This means students have little or no knowledge or experience of tropical farming especially bananas that have a large market in horticulture and is probably one of the most important horticultural crops in Australia and worldwide. This scholarship gives hands on experience and knowledge in a large industry that has wide scope for future work and research for someone in the field.

***The Mort Johnston Professional Development Scholarship foundation was established in 2007, in honour of visionary Tully banana grower Mort Johnston. Previously, the scholarship has funded innovative research and development projects designed to advance the banana industry, however last year the fund was modified to focus on supporting individual students in their third year of study of agriculture or related science degree programs at UQ.*

BREEDING FOR DISEASE RESISTANCE IN BANANAS

Pests and diseases are major production constraints for the global banana industry costing significant time and money each year in control measures. There are a number of banana improvement programs occurring around the world that seek to address these constraints by developing resistant banana varieties through conventional plant breeding, mutation and selection programs, and biotechnology.

At the recent 2017 Australian Banana Industry Congress, Dr Frédéric Bakry gave insights into the banana breeding program being conducted by CIRAD, the French agricultural research and international cooperation organization whose goal is the sustainable development of tropical and Mediterranean regions.



Heslop-Harrison, J. S. et al. Ann Bot 2007 0:mc191-12; doi:10.1093/aob/mcm191

There are a number of factors that determine the success of a banana breeding program. These include:

Access to a wide variety of genetic strains of banana (*germplasm*) for use in the plant-improvement process.

- Basic scientific understanding of the diversity and genetics of bananas, and available technologies with which to study them.
- Efficient breeding practices including
 - determining which combinations of parents are best to cross, and
 - the influence of the environmental factors on successful production of seeds. Many desirable banana varieties have low reproductive fertility.
- Early selection of favourable progeny and

efficient identification desired traits in the field in various locations e.g. resistance, productivity, fruit quality. Many progeny are slow to propagate.

Bananas have variable numbers of chromosomes which makes understanding their genetics complicated. Unlike humans which have two sets of chromosomes (diploid), bananas are polyploid meaning they have multiple sets of chromosomes. There are more than 2000 banana cultivars, most of which have originated from hybridisation between the wild parents *Musa acuminata* (A genome) and *Musa balbisiana* (B genome). The majority of cultivated varieties are triploids which have three sets (e.g. Cavendish and Gros Michel AAA, Lady Finger AAB, Ducasse ABB, and Plantains AAB. Almost all export bananas are derived from Cavendish cultivar (AAA) (Li et al. 2014) and the present wild relatives are diploid as well as some cultivated types e.g. Monkey bananas (AA).

Evolutionary studies since 2005 have suggested that AAA varieties like Cavendish and Gros Michel arose from independent hybridisation events between Mlali (AA) and Khai (AA) banana diploid sub-groups. Though originating thousands of years ago in South-East Asia, man has subsequently dispersed these cultivars around the world. Today Mlali types are only found in east Africa and neighbouring islands while Khai types are still found in South East Asia.

SOURCES OF RESISTANCE

Identifying sources of disease resistance is a crucial step in the generation of resistant varieties.

Great genetic diversity occurs amongst wild banana types in the world and sources of naturally occurring pest and disease resistance have been identified in both wild and cultivated types (Table 1).

Table 1 The frequency with which resistance to major disease has been identified in bananas.

| SOURCE | BANANA DISEASE | | | | | | | |
|----------------------|------------------------------------|--|-----------------|----------------|--------------------|-----------------|-------------------------|---------------------|
| | FOC ¹ Race ¹ | FOC ¹ Tropical Race 4 (TR4) | Yellow Sigatoka | Black Sigatoka | Burrowing Nematode | Lesion Nematode | Banana Bunchy Top Virus | Banana Streak Virus |
| WILD BANANAS | Frequent | Not rare | Frequent | Frequent | Intermediate | Intermediate | No | Yes |
| CULTIVATED VARIETIES | Frequent | Rare | Intermediate | Intermediate | Rare | Rare | No | Tolerance |

¹ *Fusarium oxysporum f.sp. cubense*—also known as Panama disease or Fusarium Wilt.

Joint research conducted by CIRAD and Wageningen University & Research Centre (Netherlands), investigating levels of resistance to FOC TR4, is in an early phase. Initial results however have shown that for the Mlali and Khai subgroups, all the Mlali types were susceptible to TR4 while members of the Khai subgroup showed a range of resistance to TR4, some being fully susceptible to some being fully resistant.

Disease resistance in bananas is generally a dominant trait over susceptibility which makes the introduction of resistance genes into progeny much easier.

CIRAD BREEDING STRATEGIES: BREEDING BY RECONSTRUCTION

A major challenge for banana improvement is to produce disease resistant, seedless hybrids that meet consumer expectations, from diploid bananas. CIRAD's strategy for breeding improved bananas strives to reconstruct dessert varieties by imitating the natural evolution and domestication of the triploid bananas. The strategy relies on:

- Synthesis of AAA varieties from AA parents
- Introduction of pest and disease resistance genes by making crosses between edible varieties and disease resistant fertile clones
- The evaluation of different parental combinations based on the performance of their progenies.

One edible diploid that has been identified as a strategic genetic resource is IDN110/Pisang Rejang (Cv Rose) (AA). This banana line has many favourable traits including:

- Resistance to Yellow Sigatoka and Black Sigatoka diseases.
- Resistance to FOC R1 and TR4 in controlled conditions (*Garcia-Bastidas et al., pers coms 2017*).
- Resistant to burrowing and lesion nematodes (*R. similis* and *P. coffeae*-Quénéhervé *et al.* 2009).
- Female and male fertility that ranges from low to medium.
- Suitable as an organic cropping system only for local consumption (because of fruit fragility).
- Used as parent in numerous CIRAD hybrids.

Six AAA advanced selections from progeny derived from crosses using IDN110 as a parental line were sent to Australia in 2014 for inclusion in field trial evaluations. These include CIRAD: 918-924-925-931-938 and 940. All are dessert bananas which were selected in the tropical conditions of the French West Indies-Guadeloupe. All six varieties are resistant to yellow and black sigatoka and FOC R1. They display different patterns of resistance to FOC TR4 and nematodes and their productivity and fruit quality also varies. These varieties have potential for tropical areas of Australia but require further evaluation in Australian conditions. A more recent selection (PRAM01), which is resistant to FOC R1 and TR4 is planned to be sent to Australia in the near future.

CIRAD is also developing a new range of Cavendish-type hybrids but are still reinforcing the disease resistance of these hybrids. This will be achieved by pre-breeding within the Khai diploid subgroup by introducing resistant genes from wild seedy relative in particular *Musa acuminata subsp. malaccensis*.

In other breeding work conducted by CIRAD, the inheritance of TR4 resistance has been studied in sweet acid AABs hybrids which are close to the sub-group of our Lady Fingers. These may have suitability for the subtropics. In crosses conducted between a Kunnan tetraploid (AABB) and a IDN110 Cultivar Rose (AA), a L9 hybrid (AAB) was resistant to R1 but susceptible to TR4 while X17 hybrid (AAB) was immune to both races of FOC.

FUTURE WORK FROM BANANA BREEDING

Work at CIRAD has great potential, and breeding for resistance to many banana pest and diseases is achievable. However further research needs to be conducted to:

- Find additional sources of resistance in wild and edible diploid bananas
- Understand the fundamental mechanisms and genetic control of disease resistance traits so they can be incorporated into breeding programs
- Conduct pre-breeding studies to understand the inheritance of new resistance genes at different ploidy levels.



CIRAD925 is one of six advanced selections derived from crosses using IDN110 as a parental line that were sent to Australia in 2014 for inclusion in field trial evaluations.

References

- Bakry F., Carreel F., Jenny C., Horry J.P. (2009). Genetic improvement of banana. In : Jain Shri Mohan (ed.), Priyadarshan P.M. (ed.), *Breeding plantation tree crops : tropical species*. New York : Springer [Etats-Unis], p. 3–50. http://dx.doi.org/10.1007/978-0-387-71201-7_1
- Bakry F., Horry J.P. (2016). Advances in genomics: applications to banana breeding. In : Van den Bergh I. (ed.), Smith I. (ed.), Pita C. (ed.), *XIX International Horticultural Congress on Horticulture: Sustaining Lives, Livelihoods and Landscapes (IHC2014): IX International Symposium on Banana: ISHS-ProMusa Symposium on Unravelling the Banana's Genomic Potential*. Louvain : ISHS, p. 171–180. (*Acta Horticulturae*, 1114). International Horticultural Congress. 29, 2014-08-17/2014-08-22, Brisbane (Australia). <http://dx.doi.org/10.17660/ActaHortic.2016.1114.24>
- Hippolyte I., Jenny C., Gardes L., Bakry F., Rivallan R., Pomies V., Cubry P., Tomekpé K., Risterucci A.M., Roux N., Rouard M., Arnaud E., Kolesnikova-Allen M., Perrier X. (2012). Foundation characteristics of edible *Musa* triploids revealed from allelic distribution of SSR markers. *Annals of Botany*, 109 (5) : p. 937–951. <http://dx.doi.org/10.1093/aob/mcs010>
- Li W.M., Dita M., Wu W., Hu G.B., Xie J.H., and Ge X.J. (2014) Resistance sources to *Fusarium oxysporum f.sp. cubense* tropical race 4 in banana wild relatives. *Plant Pathology* Doi:10.1111/ppa.12340.

- Perrier, X. et al. (2011). Multidisciplinary perspectives on banana (*Musa* spp.) domestication. *PNAS*, 108(28):11311–11318.
- Perrier, X., Bakry, F., Carreel, F., Jenny, C., Horry, J.P., Lebot, V. and Hippolyte, I. (2009). Combining biological approaches to shed light on the evolution of edible bananas. *Ethnobotany Research and Applications* 7:199–216.
- Quénéhervé, P., Salmon, F., Topart, P., & Horry, J. P. (2009). Nematode resistance in bananas: screening results on some new *Mycosphaerella* resistant banana hybrids. *Euphytica*, 165(1), 137–143.
- Quénéhervé, P., Valette, C., Topart, P., Du Montcel, H. T., & Salmon, F. (2009). Nematode resistance in bananas: screening results on some wild and cultivated accessions of *Musa* spp. *Euphytica*, 165(1), 123–136.
- Raboin L.M., Carreel F., Noyer J.L., Baurens F.C., Horry J.P., Bakry F., Tézenas Du Montcel H., Ganry J., Lanaud C., Lagoda P. (2005). Diploid ancestors of triploid export banana cultivars : Molecular identification of 2n restitution gamete donors and n gamete donors. *Molecular Breeding*, 16 (4): p. 333–341. <http://dx.doi.org/10.1007/s11032-005-2452-7>

*Written by Dr Rosie Godwin, from Dr Bakry's Congress presentation.

NEW BANANA CULTIVARS WILL HELP IN PANAMA TR4 FIGHT

By Ashley Walmsley

American Professor Randy Ploetz, says resistant cultivars are the best way forward for Australian banana growers facing a future with Panama Tropical Race 4 disease.

Speaking as one of the international keynote speakers at Congress, Professor Ploetz said Cavendish banana production would never be the same in Australia again.

His predictions came prior to the news of the second TR4 detection on a Tully farm in July.

In giving an update on international research on the disease's management, he said there were some realities Australian growers would need to come to terms with.

"Whenever anyone considers managing this, you need to consider if it is economical," Professor Ploetz said.

"Can you continue growing bananas the way you were?"

Professor Ploetz listed off several of the management techniques tried for TR4 such as fumigants, biological controls, flooding and suppressive soils but said each was limited in its own way.

"The ones that have done field studies with biological controls show, that you don't get sustainable management. It's in two or three years later you get tremendous disease," he said.

"To me, history has shown clearly that the only sustainable way to manage this problem is with resistant cultivars.

"It's going to be really challenging to come up with a Cavendish-like cultivar through conventional measures that would resist this disease and would have all the other characteristics you would want in a Cavendish cultivar.

"Consider all options before you say, no, I can't manage this disease."

He spoke of somaclonal variants, plants produced through micropropagation, mutants that are genetically similar to the original plant, but said they generally have longer production cycles and lower yields, plus some have a problem with splayed fingers.

FRONT ROW OBSERVER

Professor Ploetz has watched the disturbing development and spread of banana diseases throughout the globe in the past 30 years.

He said the original strain of Panama disease (race one) virtually wiped out the most prolific banana variety, Gros Michel, until the Cavendish was widely adopted due to its resistance to the strain.

"More recently, and more scary to me, is the popping up of TR4 around the world," Professor Ploetz said.

"This problem is really serious. So the fact that you are taking it really serious here in northern Queensland and you've come to grips with it in the Northern Territory, is good because this is probably the most serious disease for bananas.

"I work on a lot of different diseases in bananas but this one is really pernicious."

One of the aspects to TR4 which is difficult for many to come to grips with is its longevity in a paddock.

TR4 can remain within a block for a decades.

"Once you have a field infested with this pathogen, whether it's race one or TR4, it's in that field for a very long time," Professor Ploetz said.

"I can't overstate the importance of that. Once you've got an infested field, you can't go back to that field with that same cultivar and expect to produce that cultivar."

He said he thought one of the main reasons the pathogen stays on for so long is that certain weeds can act as hosts, thus he encouraged those undertaking research into TR4 weed hosts.

"It's a no-brainer that if you establish new plantings in an area and you've got this disease, you do not want to use traditional suckers so tissue culture plantlets are free of this pathogen," he said.

PRACTICE CHANGES

While he said some researchers have spoken and written on the effectiveness of healthy, clean soil acting as a suppressor to TR4, he said it was the weeds that helped the pathogen to linger, and said tissue culture plantlets were the way to go for new plantations.

Banana growers may need to re-consider how they irrigate as well, with the pathogen easily held in surface water sources.

The disease was rapidly spread in China by pumping from infected water sources, essentially inoculating entire plantations.

"If you have the potential to use bore hole water when you irrigate, I highly recommend that," he said.

When it comes to biosecurity, Professor Ploetz said growers should seek out the best sanitary products available to wash down machinery, tools and to use in footbaths.

He said footbath solutions are very effective provided no organic material or large amounts of soil sit within them.

BIOSECURITY VIGILANCE

Professor Ploetz commended the Queensland banana industry on their vigilance to date.

The question for many in north Queensland currently is: How widely spread is TR4?

"The good thing there is people are on red alert. They are aware of how difficult this problem is to manage and they are aware that you're not going to come on my plantation unless you have clean boots, and that we are going to hose you down, and so forth," he said.

He encouraged Biosecurity Queensland to keep up its visual inspections of banana plantations, and also floated the idea of using aerial examination to assist.

Australian Banana Growers' Council R&D manager, Dr Rosie Godwin, spent a week in June with Professor Ploetz and French banana researcher, Dr Frédéric Bakry, travelling north Queensland banana production areas, meeting local scientists and giving the visiting researchers an insight into Australian banana production and biosecurity practices.

"The banana industry is fortunate to have significant investment in fundamental and applied research projects which are targeted at finding solutions to the many pest and disease threats the industry faces," Dr Godwin said.

** This article was originally published in the Good Fruit and Vegetables Magazine.*

PROSPECTS FOR THE NICHE MARKET VARIETY— PISANG GAJIH MERAH

By Jeff Daniells, DAF

With the outbreak of *Fusarium wilt* TR4 in Tully there has been increasing interest in tolerant/resistant varieties. Recent studies in the Philippines have indicated that the Saba type cooking banana, *Cardaba* has tolerance to TR4.

In the Philippines and Indonesia more Saba type bananas are grown than any other type of banana, including both cooking and dessert types. Saba production figures for the Philippines were 2.6 million tonnes in 2011. They are particularly popular as snacks—mostly boiled, fried or barbecued.

DAF imported the Saba type banana Pisang Gajih Merah from Indonesia several years ago and this is what was found...

MARKET OPPORTUNITIES

Given the popularity of this type of banana in the Philippines, Indonesia and to a lesser extent Malaysia, one would expect a small but ready market opportunity amongst these ethnic communities in Australia.

The number of migrants from these three countries living in Australia was 171,000, 63,000 and 116,000 respectively in 2011. However, the target market need not just be restricted to this demographic. All those that I have had the opportunity to introduce to the taste of these bananas, think that they're great.

An easy and nutritious way to enjoy them is to boil them in the 'jacket' (peel on) until cooked through, peel and serve as a side vegetable at meal time. They are a great 'light' alternative to potato.

It is best to select fruit that is not fully ripe for this purpose because this gives the right combination of starchiness and sweetness.

Additionally, this is the preferred variety for the consumption of bells and for leaves for wrapping purposes in cooking for the three countries mentioned.

INTERNAL FRUIT DISORDER

Unfortunately, since the introduction of this variety we have encountered a physiological disorder greatly affecting internal fruit quality characterized by hard and discoloured regions in the fruit pulp.

The disorder is seasonal in nature but to date no pathogens have been isolated from samples of affected fruit. In north Queensland the disorder is confined to bunches harvested during the period June to November. This translates to bunches which have emerged roughly in the period February to July.

The disorder may be nutritional—perhaps a deficiency of calcium and/or boron brought about by the lack of nutrients reaching the fruit under wet season and/or cooler conditions. Studies are required to investigate this further.

The question is, how else might this problem be approached? Perhaps the disorder may be less of a problem outside of wet tropical coast of north Queensland. Alternatively, one could consider producing/marketing this cooking banana from north Queensland as a seasonal fruit—i.e. managing the time of bunching (time of planting/judicious follower selection/nurse suckering) to coincide with the required harvesting period from December to May and so avoid the disorder.

YIELD/PLANT CHARACTERISTICS

Pisang Gajih Merah is a large vigorous plant with a robust pseudostem and is relatively resistant to important leaf diseases. The fruit are short and distinctively squarish and angular. The trial data presented in Table 1 shows that Pisang Gajih Merah had slightly heavier bunches than Lady Finger but still only about 59 per cent of the yield of Williams Cavendish.

Table 1. Yield and plant characteristics of Pisang Gajih Merah

(Results are from South Johnstone and are averaged over a plant crop and two ratoons—all bunches were harvested when they began to ripen in the field).

| VARIETY | BUNCH WT (KG) | CROP CYCLE (MONTHS) | PSEUDOSTEM HT. (M) | FINGER LENGTH (CM) |
|--------------------|---------------|---------------------|--------------------|--------------------|
| Pisang Gajih Merah | 25.1 | 10.8 | 4.9 | 20.0 |
| Lady Finger | 21.2 | 11.0 | 4.1 | 20.6 |
| Williams | 42.8 | 10.9 | 2.9 | 28.2 |

FUSARIUM WILT TOLERANCE?

Pisang Gajih Merah is being screened against TR4 in the Northern Territory this past year to see just what level of tolerance it might have in Australia.

So far it is looking very promising at the end of the plant crop. Previously it has been screened against Race 1 and Subtropical Race 4 in the cool subtropics of Australia but was considered relatively susceptible to those races under those conditions.

We have also screened it against Race 1 in north Queensland.

Towards the end of the first ratoon crop Pisang Gajih Merah has not had any *Fusarium wilt* symptoms evident whilst the very susceptible check variety Dwarf Ducasse has exhibited wilt symptoms since early in the plant crop.

PLANTING MATERIAL?

The recommended type of planting material is pest and disease free tissue cultured plants. This cannot be emphasised enough given the risk of TR4 spread with conventional planting material in north Queensland.

Interested growers should contact Sharon Hamill, Senior Principal Scientist at Queensland DAF's Maroochy Research Station (07 53811342).



IDENTIFYING RESISTANCE TO FUSARIUM WILT IN WILD SEEDED BANANA LINES

**By Prof. Elizabeth Aitken and Dr Andy Chen,
School of Agriculture and Food Sciences, The
University of Queensland**

Most banana varieties grown for consumption are seedless. In the wild, these varieties would not survive and it is only through propagation of corms and suckers or from tissue culture plantlets that bananas can be grown as a crop. This, however, leads to huge problems when it comes to breeding for improved characteristics, such as resistance against pests and diseases, including Fusarium wilt.

Most fertile plants have two sets of chromosomes (diploid, just like humans), or have more but generally even numbered sets of chromosomes. When a flower from a fertile plant develops, the germline cells in the flower go through what is termed as "reduction division"; this means that the chromosome number halves. Consequently, pollen grain cells and egg cells within a flower have half the original set of chromosomes each. When pollination followed by fertilisation occurs these cells fuse to form the full complement of chromosome sets again and give rise to seed.

Cultivated banana is however sterile (seedless) generally due to an uneven number of sets of chromosomes. For instance, Cavendish is triploid which means it has three sets of the "A"

genome. So, when flowers are produced in a triploid plant, the process of reduction division is a bit muddled and the chromosome sets are unevenly dispersed. Consequently, no seed develops. It is only because cultivated banana is "parthenocarpic," which is the formation of fruit without seeds, that fruit is formed at all. It is actually a bit of a freak of nature. The seedless banana fruit has no benefit to the plant.

Wild seeded banana lines do exist and are found in many regions in South East Asia where banana as a species has originated. Some of these wild banana lines have characteristics that could be potentially useful to cultivated banana. Several programs across the world are investigating such wild germplasm for beneficial characteristics. At the University of Queensland (UQ), we have been studying the genetics of resistance to Fusarium wilt in such wild seeded lines, in particular the wild subspecies known as Malaccensis, which we initially identified as a possible source of resistance with our colleagues from QLD DAF.

Through conducting pollinations on these wild Malaccensis lines we have produced seed that have given rise to plants that we tested against the Fusarium wilt fungus. These tests included Race 1 and subtropical Race 4 here at UQ and with TR4 (Tropical Race 4) in collaboration with the NT DPI.

We now have an understanding of the genetics of resistance

in the wild Malaccensis plants. The resistance appears to be controlled by a single gene and we have developed several molecular markers closely linked to the resistance gene. That means that we can now screen DNA of the germplasm from breeding programs to determine if those plants are likely to carry that particular source of resistance.

Being able to use markers to select for desirable traits such as fusarium resistance can greatly accelerate the efforts to introduce resistance in a commercial variety.

This can be achieved by selectively screening plants that carry the resistance marker and thus can reduce the need of using the actual fungus to screen the plants and, importantly, avoids the risk of spreading strains of the fungus any further. This work is part of a larger programme led by the International Institute for Tropical Agriculture in East Africa, and contributes towards creating improved pest and disease resistant cooking bananas in Africa.

Our studies have also shown that there seems to be additional sources of resistance in wild banana lines and we are continuing our studies examining additional sources of resistance amongst other wild seeded banana lines. Using multiple sources of resistance within future cultivars would enhance the durability of such cultivars to any changes in the pathogen populations.

THE WORLD WIDE WEB OF BANANA RESEARCH

By Professor Andre Drenth

When standing in a banana plantation one could ask the question what the origin of the plants one is looking at, and where did the technology come from with regards to the way we grow, pack and transport them?

Almost all of the plant species we use in agriculture in Australia have been introduced from overseas and this includes all germplasm currently used for commercial banana production.

Many of the plantation practices that drive productivity have been developed in other parts of the world. All of the agrochemicals we use in the banana industry have been developed overseas.

Information and methods with regards to packaging, transport and ripening have to a large degree been developed elsewhere.

On a global scale Australia is a small banana producer with about 396,000 tonnes per annum which is only 0.27 per cent of the global banana production, estimated at around 144 million tonnes per annum. It is therefore easy to understand that we have to be connected with the outside world to observe and learn what innovations are taking place elsewhere in the world and which ones may have potential to be tried and adapted to our local conditions to improve productivity and profitability.

Australian growers, industry stakeholders and researchers can learn a lot from an overseas experience to see production practices, varieties, fruit handling and transport and marketing systems. It is important that younger growers have a look at overseas production practices and consumer trends. Programs like the Nuffield scholarships, industry study tours and private

travel are excellent ways to learn and make those international connections early on. Research in agriculture is in general highly connected with the outside world and especially in the last two decades, international collaboration has become more important.

This trend is expected to continue as universities actively promote involvement in international programs and research consortia to tackle important problems of global significance. This will no doubt bring many benefits for our horticultural industries.

Increases in international collaboration in research are especially important when we are dealing with exotic pathogen threats. Looking back at Australian research on exotic diseases such as black Sigatoka, Freckle, Fusarium wilt TR4, and bacterial wilts it is interesting to note that they all contained a very high degree of international collaboration.

In the global banana research community Australia is considered a favoured research partner due to the non-exporting nature of our industry, high standard of research, security of germplasm, and sharing of findings. It is sometimes said that we are punching well above our weight when it comes to research outputs on bananas.

Considering that we produce only one out of every 363 bananas in the world it is true that our research effort is far above what is expected for the size of our industry. It is fair to say that we are not spending significantly more research dollars on bananas compared to other horticultural crops in Australia relative to the size of the industry.

So why is it that Australia's contribution to research output is

relatively high compared to the size of our industry? One of the reasons is that Australia is a developed country with significant research infrastructure working with a well organised industry when it comes to investment in research.

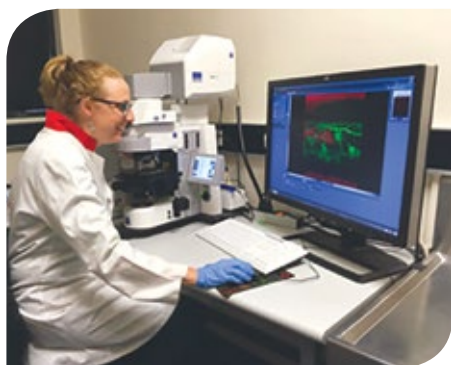
Nevertheless, the simple fact remains that the rest of the world has simply spent very little on banana research. This is partly due to the fact that, although the banana belongs to one of top food crops and is the most traded fruit in the world, the amount of research conducted is minimal as most banana producing countries in the tropics simply do not have the resources to put into research.

Contrast this with temperate crops where the research powerhouses of America, Europe, and China simply spend the bulk of their agricultural research dollars. International efforts over the last 60 years have given rise to well-funded International centres for wheat, rice and potatoes. It is no wonder that bananas sometimes get referred to as an orphan crop when it comes to research.

The current spread of TR4 in Africa, the Middle East, Southeast Asia and Australia has given rise to a significant increase in publicity around the world concerning the plight of the "Cavendish banana."

Increased awareness and understanding of the problems faced by banana growers in many countries will no doubt lead to renewed International efforts to control this disease. Through International collaboration and connections with multiple research partners we try to play our part in finding effective solution to this global problem and make it available to our local growers.

UNDERSTANDING THE MOVEMENT OF FUSARIUM WITHIN A BANANA PLANT



By Noeleen Warman

Panama disease, caused by the fungus *Fusarium oxysporum* f.sp. *cubense*, threatens Australia's banana production. Knowing how the fungus moves through the banana plant and when and where it produces spores, is an important component in containing and managing the disease, as there are severe limitations in the way this fungus can be controlled.

The infection process of the *Fusarium* fungus from the soil into the roots of the banana plant has been widely studied. However, there is little information available detailing the movement of the fungus into the rest of the plant. Understanding this process was the basis of research recently conducted at the University of Queensland, in conjunction with the Queensland Department of Agriculture and Fisheries.

Under strictly controlled conditions, both in the laboratory and glasshouse, Cavendish 'Williams' and Lady Finger banana plants were inoculated with an isolate of the Sub Tropical Race 4 of the *Fusarium* fungus, which had been transformed with a Green Fluorescent Protein (GFP) gene. This gene, when inserted into *Fusarium* allows scientists to visualise the movement of plant pathogens, but does not change the virulence of the pathogen.

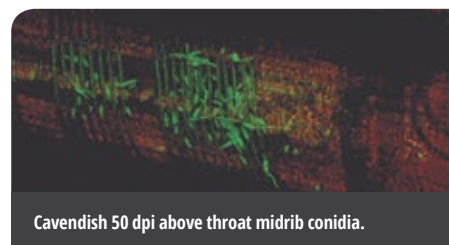
Once the banana plants were inoculated with the *Fusarium* containing the GFP gene, they were destructively harvested every 10 days for 80 days. All parts of the plant, including the roots, corm, pseudostem and leaves, were examined after harvest. A confocal microscope allowed the fluorescing fungus to be visualised, providing a detailed look into the movement of *Fusarium*, spore formation and disease development in both banana cultivars.

We found that, in both cultivars, the presence of the fungus had extended much further into the plant than was apparent from the corresponding external symptoms. In as little as 10 days after inoculation, the fluorescing *Fusarium* could be found within the roots of both cultivars. At this same time, the fluorescing fungus was also found in the corm and lower parts of the pseudostem in the Cavendish plants, but had not yet reached the corm in the Lady Finger. By contrast, external symptoms were not observed in Cavendish until 30 to 40 days after inoculation and 40 to 50 days after inoculation in Lady Finger. By the time external symptoms were observed, the fungus was visualized internally all the way up the plant and into the mid rib of the leaves above the throat in both cultivars.

An important observation from this work was the movement of *Fusarium* from inside the leaf sheaths, which make up the banana pseudostem, to the outer surface of decaying leaf sheaths via the stomata; the pores responsible for gas exchange. Once present on the outer surface, the fungus produced masses of spores (macroconidia) as well as the long lived resting spores, called chlamydospores. In addition, chlamydospores were also produced profusely in the air chambers on the inside of these decaying leaf sheaths. These observations suggest that decaying leaf sheaths or pseudostems are a potential source of inoculum and emphasize the importance in limiting the movement of plant material both within a farm and externally.

The results from this study provide a valuable insight into the movement of *Fusarium* wilt fungus through the entire banana plant. It also raises further questions, such as the potential spread of the pathogen from aerial parts of the plant. Furthermore, it stresses the importance of early identification and eradication of infected plants.

** This study was jointly conducted at the School of Agriculture and Food Sciences, The University of Queensland, with the Queensland Department of Agriculture and Fisheries under the supervision of Prof. Elizabeth Aitken. This project has been funded by Horticulture Innovation Australia Limited with co-investment from the Queensland Department of Agriculture and Fisheries (DAF) and funds from the Australian Government.*



Cavendish 50 dpi above throat midrib conidia.



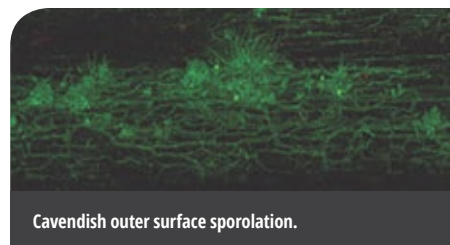
Cavendish 50 dpi leaf from above throat midrib.



Cavendish decaying outer sheath macroconidia.



Cavendish emerging from stomata leaf sheath.



Cavendish outer surface sporulation.



Conidia in xylem of green leaf sheath lady finger.

HORT INNOVATION PROJECTS

01. BANANA PLANT PROTECTION PROGRAM (BA10020) COMPLETED DEC 16

This program encompassed a range of research activities and organisations with a long-term focus on banana plant health. Sub-projects within the program included: Resistant varieties and consumer choice; Safeguarding production and markets; Sustainable production systems; and, Building science and communication. A new plant protection program began mid 2017

02. SCOPING HERBICIDE IMPACTS ON BANANA PRODUCTION AND SOIL HEALTH (BA13002) COMPLETED DEC 16

This project was aimed at understanding how registered herbicides for the banana industry affect soil health, and how this relates to banana productivity.

03. FUSARIUM WILT TROPICAL RACE 4—BIOSECURITY AND SUSTAINABLE SOLUTIONS (BA14013)

The focus of this project is on biosecurity strategies around Fusarium wilt Tropical Race 4. It provides new science, information and practices to help growers avoid the fungus, contain its spread, and manage an outbreak safely.

04. INTEGRATED MANAGEMENT OF YELLOW SIGATOKA (BA15003) AND OTHER DISEASES

This project supports the work of the Queensland-based Yellow Sigatoka Liaison Officer Louis Lardi of the Australian Banana Growers' Council (ABGC). This includes educating growers on Yellow Sigatoka (leaf spot) symptoms and assisting growers to keep levels of disease on their plantations below prescribed levels.

05. CAUSE AND MANAGEMENT OF CROWN ROT OF BANANA (BA13011)

Greater understanding of the factors contributing to crown end rot (CER) of banana is the aim of this project. It seeks to improve pre and post-harvest disease control and provide growers with information that will reduce losses from this disease.

06. NATIONAL BANANA BUNCHY TOP VIRUS PROGRAM—PHASE 3—QLD (BA15006) AND NSW (BA15007)

These projects aim to minimise the impact of BBT on growers, eradicate BBT from commercial plantations and protect growers in uninfected areas.

07. FUSARIUM WILT TROPICAL RACE 4 (TR4) RESEARCH PROGRAM (BA14014)

This project seeks to provide medium and long-term solutions for banana growers to allow continued profitable production should TR4 become widespread in the North Queensland. Key goals include; improving cultivar resistance; building resilient production systems; and, improving on-farm biosecurity practices.

08. IMPROVED PLANT PROTECTION FOR THE BANANA INDUSTRY (BA16001) DAF

Project has four main themes including: 1. Identifying varieties with improved pest, disease, agronomic and consumer preference traits suited to diversify production, expand sales, improve production efficiency and sustain production in face of disease; 2. Providing facilities and processes for new banana cultivars to be safely imported into Australia, maintained in the collection and moved across Australia; 3. Pest and disease management in tropical and subtropical banana growing regions of Australia; 4. Facilitating the collaboration and exchange of ideas between networks of scientists, researchers and industry stakeholders working in the Australian banana industry.

09. STRENGTHENING THE BANANA INDUSTRY DIAGNOSTIC CAPACITY (BA16005) (THEME 3) (UQ)

The overall objective is to develop and maintain a capacity for accurate detection and identification of emerging endemic and exotic plant pathogens to support management of emerging endemic diseases and to reduce the risk from incursions of exotic banana pathogens.

10. NATIONAL BANANA DEVELOPMENT AND EXTENSION PROJECT (BA13004) RECENTLY COMPLETED JUNE 2017

Delivered information from past, current and future research projects to growers and was recently completed (with a final report to be made available via <http://horticulture.com.au/about/resources-publications-final-reports>).

11. NATIONAL BANANA DEVELOPMENT AND EXTENSION PROJECT (BA16007)

The aim of this newly started project is to co-ordinate the delivery of the R & D outcomes to the Australian banana industry, facilitate the adoption of new and emerging technology and practices and, drive innovative thinking especially in new and younger growers.

12. BANANA STRATEGIC INDUSTRY DEVELOPMENT (BA13023) DUE FOR COMPLETION SEP 2017

This project run by the ABGC's Industry Strategy Manager Michelle McKinlay, reviews and develops biosecurity and environmental strategies for the banana industry. This includes extension services and advice to industry on the Panama TR4 program response, banana Freckle Eradication Program, changes in the state biosecurity legislation and various Great Barrier Reef water quality initiatives.

13. BANANA STRATEGIC INDUSTRY DEVELOPMENT (BA16008) CURRENTLY BEING CONTRACTED.

Follow on project for BA13023.

14. THE AUSTRALIAN BANANA INDUSTRY COMMUNICATIONS PROGRAM (BA15005)

This project keeps Australian banana growers and other industry stakeholders informed about key industry issues and the latest R&D updates in a timely way.

15. COORDINATION OF BANANA INDUSTRY RESEARCH AND DEVELOPMENT (PANAMA TR4) (BA14012)

A major objective of this project, run by ABGC's Dr Rosie Godwin, is to coordinate the industry's R&D efforts, build the knowledge and capacity, and to manage and contain the TR4. The ultimate goal of the R&D Manager is to ensure R&D for the banana industry has tangible outcomes for growers and that outcomes are adopted on-farm.

16. NSW BANANA INDUSTRY DEVELOPMENT OFFICER (BA13025) DUE FOR COMPLETION SOON

Supporting the role of an industry development officer (Matt Weinert) to develop greater cohesion in the New South Wales and sub-tropic banana industries so that needs and issues are better able to be articulated and served.

17. SUBTOPICS: DELIVERING EXTENSION FOR THE AUSTRALIAN SUBTROPICAL BANANA INDUSTRY (BA 16007). CURRENTLY BEING CONTRACTED.

Follow on project for BA13025

18. HORTICULTURE NUFFIELD SCHOLARSHIPS 2016/2017/2018 (BA15004)

Support for Nuffield Scholars in projects relevant to the banana industry.

19. REVIEW OF THE BIOSECURITY PLAN FOR THE BANANA INDUSTRY (BA15001)

As signatories to the Federal Government Emergency Plant Pest Response Deed it is necessary for the Banana industry to review and update our Banana Industry Biosecurity Plan.

BANANA INDUSTRY CONGRESS 2017 (BA16700)

Held in Sydney in June 22–24th June 2017. Further information on HIA projects is available on <http://horticulture.com.au/hortlink-spring/banana/>

ABGC PROJECTS

20. TOOLS AND EXTENSION FOR ADOPTION OF BANANA BEST MANAGEMENT PRACTICE

Funded by Department of Environment and Heritage Protection and the goal of this project is to increase the area of banana production land farmed under BMP standards with particular focus on water quality in the Great Barrier Reef. A useful output from this project has been the development of the BetterBunch App that will help growers keep better farm records.

21. REEF TRUST III

Funded by Australian Government to improve the health and resilience of the Great Barrier Reef by working with a number of industries including bananas to improve water quality, coastal habitats and biodiversity.

BEYOND THE HORIZON— ROSE HERCEG



Undoubtedly one of the most engaging and unique presentations at the Australian Banana Industry Congress this year, came from futurist, Rose Herceg.

As the nation's leading social futurist, Ms Herceg has worked closely with Defence Advanced Research Projects Agency (DARPA) in America, and knows a thing or two about the technologies being developed that will take civilisation to a whole new realm, in the not too distant future.

She is quick to describe the projects she has witnessed at DARPA, who enjoy a \$1 trillion yearly budget, as mind blowing. "DARPA invented everything that is genius in this world; the Internet, GPS," Ms Herceg said. "18 year-olds think that GPS was invented by Google with Google maps, but it wasn't. Everything in this world that is genius was touched in some way, shape or form by this organisation."

Breaking those projects down to those specifically related to fresh produce, Ms Herceg introduced the Congress audience to the Broad Operational Language Translation (BOLT). "The BOLT is currently in the form of an injection, but is being adapted to a pill form; it will allow people to have the

treatment and be able to speak another of the top five languages across the world: English, Mandarin, Spanish, Hindu Swami and Arabic.

"It works on the synapses in your brain, that small children have uber developed that are better adaptive to new language skills," Ms Herceg said. "It will give you enough conversational Spanish or Mandarin to be able to speak. The pills will be coming out in 28, 21, 10 or 7 day versions. So if you want to go over to China and cut a deal with the market there, and you don't trust the translator, and you can't speak Cantonese or Mandarin—pop a pill and off you go. Language is the single biggest barrier to business around the world."

Another technology that could aid the banana industry, she said, was Gait Biometric Technology. "This uses a three dimensional scan of your body, to predict how you think and feel."

Ms Herceg said the technology would enable predictability in the individual's observed behaviour and decision making—and importantly to the fresh produce sector, how we spend money.

When used by retail outlets for example, the customer's preference in varieties and sizes could be then used to influence more targeted sales.

FURTHER PREDICTIONS

DARPA are also investigating genetic modified insects could also help seek out and eradicate problem pests, and protect crops, while work is also being conducted on Kevlar devices, which can climb upwards and remain very sturdy and could replace ladders, netting or physical structures such as walls.

Ms Herceg says advancements are also being made on a porous concrete like substance, called Engineering Living Material (ELM), which regrows its tentacles when hit by a natural disaster.

"If the 9/11 towers had been built with this structure, at the time of the attack, they would have stayed up long enough for people to exit the building," she says. "It's a regrowing structure, so when it gets hit by something, particular for growers in disaster prone areas, structures that can regrow and stay upright. They don't look pretty, but they don't need to. It can protect crops or the home you are living in to the degree it won't fall down."

A development that Ms Herceg says is just as important is a Food Crime Unit, which criminalises people who lie about the prominence or contents of their food. She says it puts CEO's of food companies in jail for saying their food is grown one way but it is grown another.

"This is an incredible first step in criminalising negligent food behaviour, which has to be music to the ears of anyone in the primary industry that is in fresh food competing against 'fake' food," she said.

1 Day Workplace Essentials Workshop for busy agribusiness owners, managers and supervisors

Get yourself and your frontline farm staff up to speed with the latest health, safety and people management skills. Book today to attend a Workplace Essentials workshop specifically tailored for busy farm businesses and funded by the Queensland Government.

The short and practical course will enable you and your frontline staff to have a much clearer understanding of the latest workplace health and safety and industrial relations regulations, job safety assessments, incident reporting, supervisor responsibilities, performance management, and how to managing bullying and conflict constructively.

The 1 day seminar will be held in 17 locations across Queensland from September 2017 to February 2018.

COST: \$30 per person
Includes workshop, resources,
morning & afternoon tea, & lunch.

GROUP DISCOUNT: Save 20%
For bookings of 3 or more people from
the same business.

For catering purposes **reservations are essential.**

Dates & Locations:
For more information and to register visit
http://bit.ly/WorkplaceEssentials17_18

* October seminar dates include: Mareeba—Tuesday, October 17 and South Johnstone—Wednesday, October 18.

Registrations
are now open

BANANA INDUSTRY CONGRESS 2017







BANANA BALL 2017

A NIGHT TO REMEMBER





TOUGH CONTEST IN AUSTRALIAN BANANA PACKING COMP



The Australian Banana Packing Championships came down to the wire at the Innisfail & District Show this year.

Just eight points separated the first and second placed teams, with just one point between second and third.

Tully brothers Scott and Avi Solien ended up taking home the coveted championship trophy in the main packing event sponsored by Frank Lowe and Sons.

The main event sees 12 teams of two—six from Innisfail and six from Tully—competing over two nights, with the fastest three teams going into a final showdown.

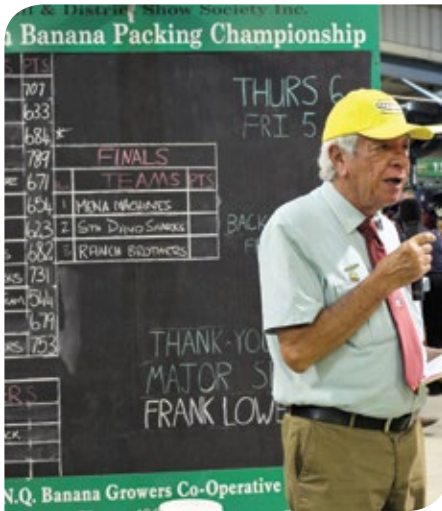
During the contest, each team is given two bunches of bananas which they must cut and pack into three cartons. Competitors are given scores from five judges on all aspects of packing including presentation, speed, team work and wastage.

A highlight of the night is the Backpacker Packing Competition, sponsored by Cumic Steel, which again drew a large and vocal international gathering of spectators.

Two teams entered the contest, with Elen Williams of Wales UK and Jill de Graaf of Belgium taking home first prize.



COMMUNITY EVENTS



INNISFAIL SHOW BANANA EXHIBIT



It was a fantastic turnout for the Innisfail and District Show Banana Exhibit, with organisers commending the quality and numbers entered into the annual contest.

"We were very impressed with the overall exhibit and display. It was certainly bigger than previous years and we were encouraged by a lot of first-time exhibitors," chief steward Robert Zahra said.

Judges had a task on their hands when it came to selecting winners in the 23 entry categories.

Di Carlo Bananas was named Most Successful Exhibition on aggregate points, after winning Best 3 Clusters, Champion Pair of Hands, Heaviest Single Banana and Best Six Singles. The farm also placed second in five other categories.

Champion Ratoon Bunch was won by Celledoni Farming; Sellars Bananas took home Champion Plant Bunch and Heaviest Ratoon Bunch went to LMB Nerada.





TULLY SHOW BANANA EXHIBIT



It was another very successful banana exhibit at the Tully & District Show with more than 50 bunches and 40 cartons entered into this year's exhibit.

Long-time judges Dennis Lindsay and Greg Bradshaw had a tough job on their hands selecting winners.

Chief steward Cameron Flegler said entries were a lot more diverse than previous years, and included several new exhibitors. "They came from far and wide this year."

"It is the Tully Show's 80th year, maybe that's had an effect. Also, prices have been up, so people are a bit happier. It's always nice to have a bit of money in your pocket, that gets you out and travelling, and we have a great social night on the weigh-in night," Mr Flegler said.

Sellars Bananas was named the Most Successful Exhibitor, taking home Champion Bunch, Champion Plant Bunch, Champion Pair of Ratoon Bunches, Champion Pair of Plant Bunches, Champion Large Cluster Carton, Champion 15kg Cluster Carton Hand, Champion Pair of Hands, Champion Carton (Tully district) and Champion Bunch (Tully district). The farm also placed second in three other categories.

The MacKay's Ranch Road farm was the second Most Successful Exhibitor.



COMMUNITY EVENTS



PANAMA OPEN DAY



More than 80 banana growers, researchers and other industry leaders took part in a Panama disease open day at the South Johnstone Research Station in May.

The interactive event was designed to highlight the latest research and development focussed on Panama disease Tropical Race 4 (TR4).

Hosted by the Department of Agriculture and Fisheries (DAF), the day included exhibits and a field tour, highlighting the latest Panama studies and on-farm biosecurity practices, focussed on the short-to-long term management of the disease.

A key component of the day was the launch of the Banana Best Management Practices, On-farm Biosecurity manual, designed for growers to help manage on-farm biosecurity risks.

The manual was jointly funded by Horticulture Innovation Australia using banana research and development levies and funds from the Australian Government with co-investment from DAF.



BUNCHY TOP UPDATE

By Barry Sullivan Project Leader, National Banana Bunchy Top Virus Program (Phase 3)

Banana Bunchy Top Virus is still present in South East Queensland and Northern New South Wales and we have a committed team working every day to reduce the presence of the virus, while preventing further spread.

In Northern NSW a team of five staff carry out regular farm inspections in search of the virus.

Infected plants detected are immediately destroyed by stem injection using herbicide and the aphids that spread the virus are also treated with an insecticide. Folia spraying of the plants is also carried out using a paraffin oil product complementing the insecticide. Adjacent to the commercial farms, buffer zones are also inspected in an effort to rid the virus from private back yards/properties.

In South East Queensland, we have one full-time inspector and one part-time inspector. Farms known to have Bunchy Top Virus are inspected monthly and buffer zones continue to be checked also.

Both projects work closely with their relevant state government agencies such as NSW department of Primary Industries and Queensland Department of Agriculture and Fisheries.

Banana Bunchy Top virus has been present in Australia since 1915 and is the most devastating viral disease found in banana plants worldwide. Plants infected with the virus must be destroyed.

KEY POINTS ABOUT BUNCHY TOP VIRUS ARE:

- Bunchy Top Virus can only be spread in two ways
 - By the banana aphid
 - By the movement of infected planting material.
- It is important to treat infected plants correctly minimizing plant disturbance and aphid dispersal.
- If one stem in a clump of bananas shows infection the whole clump needs to be destroyed.
- The virus is hard to detect particularly in its early stages and so requires experienced inspectors to verify infections.
- The virus is only found in the plants themselves and not in the soil so once treated plants are completely dead they are no longer a threat for further infection.
- It is important to keep banana patches clean and free of weeds to allow more efficient inspection of suckers and plants.

Both Bunchy Top projects (NSW and SEQ) have recently been reviewed by an external review team and a number of recommendations have been put forward. One recommendation has been to carry out some analytical studies of the available data sets to determine possible infection trends and efficiencies that could be utilized into the future. This process will then be followed up with some workshops by the project steering committee and may influence changes to the projects operations.

Other activities have been to do some trials using drones to assist with the inspection program. Initial trials have gone well with further trials being carried out in the near future. This could be a relatively low-cost activity to complement the on-ground inspection program.



BETTER SOIL PHOSPHORUS FOR BANANA GROWING



Phosphorus fertiliser management of bananas has received little attention in the past. The result is that phosphorus application rates have generally remained unchanged since the 1990's. This contrasts with impressive reductions in the industry usage of nitrogen fertiliser.

A recent project run by NQ scientists, John Armour and Rob Lait, has examined ways for the industry to save money on phosphorus fertiliser. An important additional benefit will be reduced environmental impacts. This is based on the simple fact that 'the more you add, the more you lose'.

They have sourced more than 2,000 soil test results over the last five years from commercial laboratories. All grower and farm identification was removed from the results to ensure privacy. Some growers were interviewed to check trends in soil test results and in phosphorus fertiliser use.

The Colwell test is a cheap and readily available soil phosphorus test used to monitor available soil phosphorus. More than half of the samples had Colwell phosphorus values in the High to Very high categories (>75 mg/kg). This reflects a history of high phosphorus application. One third of banana paddocks need nil phosphorus fertiliser.

As excess phosphorus in the soil does not increase bunch size, we recommend that growers check their Colwell P soil test results. Many will be able to greatly reduce their phosphorus application rates. This will reduce production costs and reduce the environmental risk from excessive soil phosphorus.

We are grateful to Incitec Pivot Ltd and Total Grower Services for providing the soil test data and to the Department of Environment and Heritage Protection for funding the project.

For more information, contact John Armour, Principal Scientist with Rob Lait and Associates, on 0418 428418 or trop.landscapes@gmail.com.

COFFS HARBOUR SHOW

Extreme weather events and a dry spring meant entries were down at the Coffs Harbour Show Banana Exhibit in May, however bunch quality was good.

This year's exhibit celebrated the history of the Coffs' banana industry, with grower David Pike putting on a display of wooden banana box making, used before cardboard packaging was introduced. David also took home the title of Most Successful Grower in the exhibit judging.

Donated fruit of Cavendish, Lady Finger and Ducasse was given away during the show. Once again patrons were impressed with the flavour of the Ducasse fruit.



NSW Showgirl finalists Jaclyn Lindsay and Meg Austin liked the flavour of Ducasse.

STRATEGIC INDUSTRY DEVELOPMENT PROJECT

The Hort Innovation funded project, BA 13023—Banana Strategic Industry Development—comes to an end in September 2017. Throughout its three years, the project has taken in the review of biosecurity regulations, development of a water quality strategy and many issues related to the detection of TR4.

Here, project leader, the ABGC's Industry Strategy Manager Michelle McKinlay reflects on the many achievements of this project.

WHY WAS THE PROJECT NEEDED?

The Australian Banana Industry Strategic Investment Plan 2014/15–2018/19 identified a number of areas that were critical to the future sustainability and integrity of the banana industry. There was agreement that the industry needed to take a long term and more strategic approach to issues that were starting to demand a response—such as biosecurity and the environment. The Hort Innovation funded project—BA 13023 Banana Strategic Industry Development—has helped the banana industry develop a coordinated and integrated approach to important issues.

The project has helped to inform growers about the changing policy areas of biosecurity and the environment and given government officers access to factual information about the industry that has delivered better decisions.



WHAT WAS IT LIKE WORKING FOR THE BANANA INDUSTRY?

Banana growers are, generally speaking, a much younger demographic than you will find in many other agricultural industries. They are far more progressive and open in their thinking—they are keen to look for new ways to improve production systems. As part of the project, I worked with officers from the Department of Environment and Heritage Protection and ABGC reef extension officer Rob Mayers and together we developed the BetterBunch app which is a record keeping system for smart phones and tablets. The initial interest and take up in the app has been strong and significantly higher than the adoption in other industries. It is great to be able to point to something so practical and directly beneficial to growers and say “I helped create that”. It is positive that the Queensland Government saw the banana industry as a worthy recipient of a significant investment.

The Banana Industry Water Quality Strategy, is also part of this project, with a target of 70 per cent of all north Queensland banana production land will be farmed according to the BMP Guidelines for nutrient and sediment management by 2020.

IS THE INDUSTRY ON TRACK?

This industry is well on track to achieve the 2020 target. Each week we are delivering BMP training to a grower and with the regulations knocking on the shed door, I expect the demand for training to increase.

I feel privileged to have spent the last three years working on behalf of banana growers. They are a great bunch of people who care passionately about their industry. Their passion and commitment motivates me to give 110 per cent to my project and the industry.

WHAT DID THE PROJECT ACHIEVE?

The project has achieved many things and has been very successful in making sure that decision makers, particularly in government, are informed about all relevant aspects of the industry.

As a key part of the project, we've worked with a number of organisations including Terrain NRM and CANEGROWERS to successfully bid for \$1.4million over three years to deliver water quality related extension for banana growers in north Queensland. This was under the banner of The Reef Alliance.

The funding provided by the Australian Government has allowed the ABGC to employ two extension officers to work individually with growers on ways to reduce the amount of water flowing off their farms. The funding will also deliver an incentives program and some innovation trials that could eventually end up improving the current description of best management practice. This would be a great legacy for the Australian Government's Reef Trust III program.

WAS IT A PROJECT THAT HAD STRONG COLLABORATION?

Absolutely. A large part of my role has been to work with government departments as they have reviewed certain pieces of legislation, providing them with information about the banana industry, how the production system works, how their proposed changes will impact on growers and suggesting other ways to generate the change they are seeking.

While the biosecurity regulation work has been completed, the review of environmental regulations—targeting the quality of water leaving farms—is just starting to ramp up. This will continue to play out over the next 12–18 months.

This means that growers will have time to make some changes to their practices (if they need to) before the regulations are introduced. The industry can't stop the regulations but they can minimise their impact if they use this time effectively.

**Hort
Innovation**
Strategic levy investment

**BANANA
FUND**

GETTING MORE BANG FOR YOUR BANANA BUCK

KEEP PUMPING



Nature's non-stop energy snack



After a successful six month period of marketing for Australian Bananas, the brand is set for another big push in the second half of 2017. As always, the focus will be on getting the maximum bang for your banana buck. Elisa King explains.

TELEVISION

We will run a heavy first burst of TV advertising in late August/early September to kick off the next phase of the campaign.

After three years, our TV commercial is now well established in the market. With this in mind, we will be running a greater proportion of our more cost-efficient 15 second commercials versus 30 second commercials. This cost advantage will allow us to reach a higher proportion of the market (45 per cent versus 35 per cent).

Our TV commercials will run in all major metro markets across high-rating programs like 'The Block' on the Nine Network, 'Australian Survivor' on the Ten Network and 'Hell's Kitchen' on the Seven Network.

Our ads will also appear in all major regional markets and on pay TV, which now reaches 30 per cent of households nationally.

In total our TV investment represents 42 per cent of our total July–December media investment.

OUT OF HOME POSTERS

We will continue our strong out of home investment during next financial year.

Buses, Retail Digital Poster Panels, Gyms and Large Format Digital Billboards will all feature Bananas advertising over the campaign period from September to the end of November across all national markets.

Retail Digital Poster Panels are a great way to extend our campaign in a highly targeted way. Seventy per cent of our allocated panels in shopping centres are located right in front of supermarkets to prompt customers just before they purchase. These panels are also time-targeted to appear during key snacking and shopping periods. This activity will feature a total of 805 digital panels nationwide.

The bus-side component of our out of home advertising investment will impact even more people on their daily commute. This financial year, we have secured the entire bus-side network throughout the campaign period (versus the 35 per cent we have booked in the past) which will give us a massive presence in the market.

Finally, we will run a specially tailored creative campaign in over 400 gyms nationally. This fitness-focussed campaign will appear on over 975 digital screens as well as over 1800 standard TV screens. We also negotiated 636 cardio screens free of charge, as well as a full page back cover advertisement and a two page editorial in the September/October issue of Fitness First Magazine.

Our Out of Home investment amounts to 28 per cent of our total July–December media investment.

ONLINE

Our online advertising activity will run from end of August to mid November.

The online campaign will extend the visibility of our 15 and 30 second TV commercials in popular online environments such as premium Catch-up TV.

We will also be running punchy new six second video ads on YouTube and social media platforms. These shorter ads are designed to quickly convey

GETTING MORE

BANG!

FOR YOUR BANANA BUCK



our message, are non-intrusive, and can be placed more frequently at a cheaper cost, ensuring we reach a larger number of online consumers than we have ever been able to before.

We will also reintroduce online display ads to increase our exposure on high-visibility websites.

In total our online investment amounts to eight per cent of our total July–December media investment.

CINEMA

Starting mid September, we will be reintroducing our 15 second commercial to cinema-goers nationally. This will give huge exposure to Australian Bananas beyond the traditional TV audience. And it will do it in shopping centre locations, close to supermarkets.

We are strategically running the cinema campaign during some of the busiest periods for cinema attendance, with our 11 week campaign falling over the October school holidays.

We have secured prime positioning on 785 screens across a wide range of Blockbuster movies such as; Thor: Ragnorak, The Emoji Movie, Ninjago: The Lego Movie, Blade Runner 2049, The Kingsman, Captain Underpants and Bad Moms 2.

We will be extending the cinema activity with 15 second animated videos on 216 cinema foyer digital screens. Plus, we have negotiated 61 additional cinema screens and 216 additional portrait digital screens free of charge.

Our cinema investment represents six per cent of

our total July–December media investment.

SOCIAL MEDIA

The Australian Bananas social media activity is now well established and delivers a huge degree of branding and visibility for us throughout the year.

We will be producing six pieces of video/ animated content per month that will be pushed out to our audiences across mobile and desktop social platforms.

As well as our notoriously catchy creative we will have a greater focus on recipes and building partnerships with high profile social media influencers.

Our social activity represents 15 per cent of our total July–December media investment.

PUBLIC RELATIONS

We will continue our pro-active approach to PR to help build awareness and positive conversations about Australian Bananas in the media.

Billy Slater has been signed up for another year as an ambassador. He'll be posting about and promoting Australian Bananas as always!

Dietitian, Susie Burrell, will also continue to be an ambassador, promoting the health benefits of bananas. We'll be harnessing the audience on Susie's blog, Shape Me, to further extend the reach of our message.

To stay top of mind with food media, we have created 12 new delicious banana recipes along with some mouthwatering new photography. These will

be rolled out in two stages—in September and February—via PR and also on our website.

We have ongoing media monitoring in place so that each time bananas are mentioned we get alerted and can respond to them whether they're negative, or positive.

SPONSORSHIP AND COMMUNITY EVENTS

This year we are supporting 35 major athletic events (including the Weetbix Kids TRYathlon, Ride to Work Day and the Gatorade Triathlon).

And of course we will continue to support our local grower community events throughout the year.

Our schools program will reach thousands of students around the country, reminding them of the wonderful health benefits of bananas. The idea is to get to them while they're young and make them banana fans for life!

And talking about starting young, we'll continue the placement of our branded banana cases in over 225,000 Bounty Bags going to new mums. It's a great opportunity to remind them that bananas are a great one handed snack to enjoy while breast-feeding and a great food for babies.

NON-STOP ACTIVITY

This upcoming six-month period promises to be another massive opportunity to build the bananas brand and grow banana sales. Through careful planning and strategic investment, it will be a period of non-stop marketing activity for nature's non-stop energy snack.

STAYING AHEAD OF THE BUNCH

Knowing how much Australians love our most iconic fruit—you could be forgiven for thinking that marketing bananas was fairly straightforward.

But with 94 per cent of households buying bananas each year, building on this market share requires some serious marketing prowess.

Addressing the Australian Banana Industry Congress 2017, Hort Innovation Marketing Manager Elisa King said trying to capitalise on exceptionally strong sales was a challenge, when pretty much everyone is already buying bananas.

Ms King said that recent studies conducted over the past two years showed that the number of people who stated that they consumed bananas once a week, increased from 78 per cent in 2015, to 82 per cent in 2017.

"The answer is to give people more reasons to buy us more often. That is our primary campaign objective, which is about increasing purchase frequency,"

Ms King said.

Achieving this, requires smarter and targeted consumer-focussed advertising to grab a buyer's attention, at optimal times of day, from city streets and shopping centres, to mobile phones.

"We can advertise to people in lifts when they are going out to get their cup of coffee and remind them to snack on a banana, instead of a muesli bar or bad pack of chips," Ms King said.

"Technology is clever (too) and what we can do now is that we can target key words. What this means is that if someone is typing in muffin recipe, we can actually serve them up with a banana ad."

But, while digital media might seem the obvious choice for modern marketing, Ms King said television continued to be the most effective means of gaining widespread consumer awareness.

However, the high cost of small screen advertising

meant these marketing bursts could only be run several times a year.

"But when we are on TV we reach a large number of people," she said.

"In the past year, it is just over 11 million eyeballs we have got to, but we compliment that with our digital advertising, our catch up TV and we book premium programs. In the past 12 months we have had 4.5 million views."

To capitalise on this awareness, Australian Bananas earlier this year launched its out-of-home approach, with highly visible signage in high footfall retail and consumer environments such as major shopping centres, buses and trains.

Ms King also told Congress delegates of Australian Bananas' highly successful Facebook presence, saying they blew their competitors "out of the water" when it came to their engagement rate.

PETER KURUVITA BANANA RECIPES



If you attended the Australian Banana Industry Congress in June, you will have seen the very entertaining celebrity chef Peter Kuruvita show off his culinary skills by whipping up some great banana dishes.

As most of you would know, our beautiful Australian bananas and banana products can be used to create some delicious recipes, from entrées to mains and desserts. Below are two of our favourite Peter Kuruvita banana based recipes we are sure you will love! And compliments to his assistant chef on stage—Paul Inderbitzin for his good-humoured narrative.

BANANA AND HONEY SOUFFLÉ

Peter: *The first soufflé I learnt back in 1979 and still the best, the most important part of this is to ensure the bananas are super ripe. If not, the soufflé will shrink instead of rising. Strawberry coulis makes this dish even more luxurious; add some double cream and you will be in heaven. Also, forget the gentle, gentle attitude that people talk about when making soufflé's, this will resist the banging of the oven door and stand upright for at least 5 minutes. Just remember to make sure the bananas as very, very ripe!*

Ingredients

- 1 tbsp butter melted
- 2 tbsp castor sugar
- 50g good double cream
- 1 very ripe banana
- 1 tbsp honey
- 3 egg whites
- 1 tbsp white sugar

Method

- Pre heat oven to 180 degrees celsius.
- Grease 2 soufflé moulds with butter and then castor sugar; ensure it is completely coated in the sugar. Then tap them out so there is no excess sugar left.
- Whisk the egg whites with the sugar till it forms peaks.
- Blend the banana with the honey and then fold into the egg whites.
- Bake for 9–14 minutes or until golden and risen.



BANANA BLOSSOM CURRY

Ingredients

- 1 banana blossom outer leaves removed to expose the white leaves
- 1 tsp turmeric
- 1 tsp raw curry powder
- ½ tsp chilli flakes
- 1 tbsp Maldives fish ground coarsely
- 1 tbsp black pepper
- 2 tbsp virgin coconut oil
- 1 small onion chopped
- 1 clove garlic chopped
- 1 sprig curry leaves chopped
- 1 small piece pandanus leaf chopped
- 250ml coconut milk
- 50g tamarind chutney

Method

- Shred the banana blossom very finely in a circular motion around the flower.
- Place into a container of clean water and a tablespoon of salt for 20 minutes.
- Wash thoroughly massaging the flower for a few minutes, this removes bitterness.
- Mix the flower with the dry spices and Maldives fish.
- Mix the tamarind and coconut milk together.
- Heat the oil and fry the onion, garlic, curry leaves, pandanus, till fragrant.
- Add the blossom and cook for 5 minutes till tender
- Add the coconut mixture, season and cover.
- Simmer for five more minutes.



Luna[®]
PRIVILEGE

*"Getting to market
is a breeze!"*



Boost leaf health to keep production flying along

Luna[®] Privilege offers unparalleled in-field control of problematic fungal diseases that can otherwise reduce the vigour of your bananas. Vigorous plant growth is the key to growing better bunches with more vitality.

Find out more from lunaprivilege.com.au or your local agent.



MOVENTO[®]
ENERGY

A big shock for banana pests

One convenient application of Movento Energy combines the power of two insecticides to control banana weevil borer and rust thrips, without giving mites a free hit.

Speak to your Bayer representative or local agent today, or for more information and offers, visit crop.bayer.com.au