# Mango Matters

OCTOBER 2022 | VOLUME 49

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Hort Innovation
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**Want to contribute?**

*If you would like to submit pictures and story ideas to AMIA, or provide feedback, please contact the AMIA team via the details listed on this page.*

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# CEO'S REPORT

**Brett Kelly**
Chief Executive Officer, AMIA
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*"Please remember how important forecasting is in respect to managing volumes, timing and ultimately helping achieve better pricing outcomes. Our information in the weekly updates is only as good as what we receive, consistency and accuracy are crucial."*

**- BRETT KELLY**

I hope all growers/members are looking forward to a great mango season this year. All signs have been good to date for a promising outcome quality and also with greater volume than last year. Similar to last year, challenges again are in labour, with some supply chain issues. Though most growers I have spoken with have planned well ahead and are well organised for this year.

Please remember how important forecasting is in respect to managing volumes, timing and ultimately helping achieve better pricing outcomes. Our information in the weekly updates is only as good as what we receive, consistency and accuracy are crucial.

*AMIA CEO Brett Kelly with Farm Manager Dale McDonald from Nutrano in Katherine.*

Biosecurity protocols, standards and practice at farm level are essential to maintain a safe quality environment and achieve best practice with mango quality, production and harvesting. Please ensure you are up to date with all information and practices. You will find information and all relative links on your AMIA site: www.industry.mangoes.net.au. You can also contact our IDOs or IDM if you have any queries.

Current Projects as per the industry SIP (Strategic Investment Plan) Best Practice/ Extension (MG21002) and Communications (MG21001) are progressing well with all milestones being met and action points on time. The SIP (Strategic Investment Plan) for Export is available on the AMIA site (under resources) for your information and update, please take the time to familiarise yourself with this. I can now also confirm the AMIA has successfully secured the Supply Chain Engagement Project (MG22500) with Hort Innovation. This enables us to have direct ongoing marketing communication with all major retailers in conjunction with our partners Hort Innovation. Andrew Burns has been engaged by the AMIA to continue this work as SCE Project Manager.

Marine Empson IDM (Industry Development Manager) and our IDOs (Industry Development Officers) Celine and Paige have been busy with organising all regional pre-season Roadshows. Please attend if possible as the roadshows are back to face to face (after covid) and are full of informative presentations and industry/grower interactions. All upcoming dates and agendas can be found on the AMIA site.

Gabby Taylor has been appointed (commenced August 22nd) as our new Communication Manager replacing Jess Mitchell. I would like to thank Jess for all her hard work and support to our grower members over the last six years. Gabby has excellent experience working in a similar role in Horticulture and is proving to be a great asset to the AMIA team.

The AMIA Internal Strategic Plan is progressing well. The Cost of Production Spreadsheet template is being drafted then will be reviewed and finalised. When approved by the AMIA Board it will be available for download to members. We will also have a regional measuring/comparison COP spreadsheet for members to check where they sit approximately in their production costs. We recently have had several meetings with all major retailers updating them on industry issues, in particular the cost of production/ business cost increases. We have also presented several options for them re: potential projects that will aim to bring closer commercial relationships between members and retailers; with predominant focus on supply chain, pricing, profit, and ultimately grower sustainability. I will keep you updated as we progress.

I will continue to rotate around with grower visits where I can get your feedback and update you on industry issues and what action are being taken. I wish you all a great season and please do not hesitate to call any of the AMIA team if you have any queries.

# CHAIRMAN'S REPORT

**Ben Martin**
Chairman, AMIA
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*"Given the challenges that our growers are facing, the AMIA has developed a cost of production tool to assist members in understanding their true cost of production. This tool will be available to AMIA members only."*

- BEN MARTIN

We're currently halfway through our mango roadshows. All of the feedback that I have received has been very positive. We have had a great turn out of growers, and I would like to thank all those growers who have attended these roadshows. I would like to thank the sponsors and presenters that have presented and sponsored our roadshows this year. We appreciate their support and commitment to the industry.

The flowering across the country looks very good. While there is still a long way to go until harvest in some regions, we are seeing signs of a good crop right across the country. This year, more than ever, marketing will play a pivotal role in the success of the season. With our new Supply Chain Engagement Manager, Andrew Burns, and CEO, Brett Kelly, we will be in good hands. Andrew's presentations at the roadshows so far have been received very well.

One aspect that can assist our marketing plan is an accurate crop forecast. I would ask growers to reach out to the AMIA team if you have any issues trying to develop this.

As most of you would be aware Jessica Mitchell has left the AMIA. I would like to take this opportunity to thank Jess for her hard work and commitment to her position and the industry over the years. I would also like to wish Jess good luck in her new role. We have since recruited Gabby Taylor to be the new Communication Manager. I would like to take this opportunity to welcome Gabby into this new role. I have no doubt given her previous experience, she will fit in well with the team and pick up where Jess left off.

As I'm sure all growers are aware that the cost of production continues to rise. Given the challenges that our growers are facing, the AMIA has developed a cost of production tool to assist members in understanding their true cost of production. This tool will be available to AMIA members only. Please watch this space, as there will be more tools coming soon for the AMIA members to utilise in their business.

It has also been encouraging to see some new chemistry coming through for mangoes. Chemical companies invest a lot of money and time developing these chemicals and permits / labels to be used in mangoes. Their investment does not go unnoticed, and I would like to thank them for this investment in the industry to enable growers to have access to some of the latest chemicals on the market.

# DIRECTORS' REPORTS

## Northern Territory & Northern Western Australia*

**Mitchael Curtis**
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E: mitchael@me.com

Greetings.

This is my first report, and I am honoured to be on the AMIA board for the Katherine region.

The Katherine region has flowered very strongly in August, which is a little later than the past few years, and very nice to see for the KP growers after two consecutive down years. The season has been very mild up until the last week of August and we have now jumped up to consistent temperatures of around 36 degrees each day.

This is putting pressure on the tree for the expected drop which will most likely be around the first week of September and based on the level of flowering we should have a good strong yield for the coming season.

> *"It was good to see the new technologies at the roadshow. There are robotic harvesters coming which will assist in relieving the requirement for such a large workforce in the future."*
>
> - MITCHAEL CURTIS

There is a lot of pressure around workers and the sooner we can secure the workforce for each of our seasons the better. As there will not be many workers available to get at the last minute, I can't stress how important it is to work with your agents early, and get commitments, so they have time to get people in for you.

It was good to see the new technologies at the roadshow. There are robotic harvesters coming which will assist in relieving the requirement for such a large workforce in the future. There is also equipment being developed to accurately forecast our crops and other things going on in our orchards. Anything that can give us good clear data we can trust will give us fantastic management tools.

Looking forward to a fantastic 2022 mango season.

**Geoff Warnock**
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This year the initial flowering began the first weeks of June when overnight temperatures dropped to 14 degrees. At the time of writing we have experienced constant night temperatures of 16 degrees or less. This being unusual as we normally have 6 or 7 cool nights then it will warm up to above 18 degrees for a period.

Resulting from this the flowers have been consistently pushing out since the beginning of June. The result of this is that even the most neglected trees have ended up covered in flower. I would not be surprised if the pollinators joined the unions asking for an increase in pay for work done. In all the years I have lived in the region I have never seen such a prolific flowering.

We still have a number of bridges to cross before the fruit is in the tray, especially it is usually the first couple of weeks in September that the area experiences the first days over 40 degrees and they usually cause considerable fruit drop.

Other areas of concern will be availability of labour to pick and pack, also export market access to take pressure of the domestic market.

I also wish the growers a good result from the season.

## Far North Queensland & North Queensland

**John Nucifora**
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E: flossndeb@bigpond.com

Before we know it, another season is upon us. The flowering is very strong in our region. I haven't seen flower like this ever in my time in mangoes.

I'm a little concerned about the volume that is going to come through, but it is still too early to call it.

We just had our Mareeba / Dimbulah roadshow, and it was a great turnout. I thank the AMIA for putting on such a successful roadshow.

On September 13th, I will be attending the Bowen / Burdekin roadshow and I am looking forward to catching up with the local growers there.

We are currently formulating a template for the cost of production. It will be very interesting to see what it comes in at. I urge all growers to partake in this important exercise.

I wish all growers well in the coming season.

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*Continued from page 6*

**John Nardi**
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The 2022-23 mango season is kicking off and we are seeing increasing volumes starting to arrive in the markets at the time of writing (2nd September). In the Mareeba-Mutchilba-Dimbulah areas we are seeing a very strong flowering across all varieties. It has been a very good winter for us for flowering with no major weather implications for most. It seems the coldest weather has gone and the risk of any frost is hopefully now over. We should therefore see quite a good fruit set if all goes well however, we have seen other years of strong flowering and fruit setting followed by large fruit drops. The indications I am getting from most is that timing is looking very similar to last season at this point.

It is still a little early to predict volumes, but it is looking very likely to be a bigger total crop across all varieties. I do urge growers to accurately forecast crop volumes and consistently update if needed as the season goes on. This will assist all in planning and sales strategies which in turn benefits everyone.

Growers should have a clear marketing plan in place given the potential for increased volumes this season. Once again, we look like facing issues with labour and we may also see issues with transport. I would also encourage all growers to be diligent with planning and do everything they can to secure their staff and transport requirements as early as possible. I expect that if the NT Growers are struggling with staff the same will follow suit for QLD. I would hate to see crops not harvested due to lack of labour and planning.

If we do see increased volumes and we do want to see the best returns for our fruit, we must focus on delivering a quality product to meet consumers expectations. This is a process that starts in the field and follows all the way to the consumers home. A focus on quality will ensure we see the best returns we can for our fruit.

I wish all growers the best of luck with coming season.

## Southern Queensland & New South Wales

**Karl Gygar**
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Flowering across the region is in full swing with many growers reporting excellent flowering. Weather conditions have been favorable at this stage however, there is some trepidation about recent reports of a very wet summer on the way.

As we all know, availability of labour is an issue that is becoming harder and harder to solve. I strongly encourage growers to review all possible options to ensure a smooth season. The recent government summit on labor issue resolved to increase visa availability and this may help increase the pool of workers available. The AMIA has been working with the NFF to push the government to provide better pathways for people into agriculture and we will continue to do so.

*The AMIA has been working with the NFF to push the government to provide better pathways for people into agriculture and we will continue to do so.*

**- KARL GYGAR**

Many in our industry are already in the full swing of picking and I would like to wish them all best at this busy time. For those about to head into their harvest, I also hope you have smooth and hiccup free season.

## Southern Western Australia

**David Morcombe**
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We have had a wet winter with above average rain.

In Gingin there has been early flowering, no doubt aided by well rested trees after very poor crops last season. Hopefully, we will see a warmer October than last year, so we get some decent fruit set. The early flowers are not helpful as temperatures are too cold in August and most of September for fruit set.

Labour has been an ongoing issue in the region, and I am concerned that this will become the new normal in future. The costs of inputs has soared this year, and combined with the labour issues I fear that we are going to see growing becoming a less viable business unless we can see some meaningful improvement in prices.

In the long term, developing technology such as high density, trellising and robotics may help but that provides little comfort for the present time.

It was good to see the publicity around labour issues in the NT being aired in the media during the Darwin picking period.

# AMIA & INDUSTRY NEWS

## Welcome to new Communication Manager

We would like to welcome our new Communication Manager, Gabby Taylor. She is replacing the wonderful Jess Mitchell who was with Australian Mangoes for six years and has contributed significantly to the work of the AMIA.

Gabby has previous experience in horticulture, working in the berry industry with Oz Group Co-op Ltd in various roles. She brings experience in marketing and branding, communications, and project management, playing a pivotal role in introducing frozen Australian blueberries to the shelves of Coles supermarkets. She most recently worked in communications within the waste management industry and is very much looking forward to learning all about mangoes and the needs of the mango industry and its growers.

*New AMIA Communication Manager, Gabby Taylor.*



## Updated guidance material for horticulture code

The Australian Competition and Consumer Commission (ACCC) has updated it guidance material for the horticulture code of conduct.

The code seeks to protect horticulture growers by requiring all trading with agents and merchants (traders) to happen under a written agreement. The agreement must include certain elements, such as how prices are calculated and when the grower gets paid.

The update provides more detail on the code's key elements, including the requirements for traders to publish their terms of trade, and for merchants to report the gross sales price when paying a grower an amount calculated by a method or formula.

The ACCC's webpage: www.accc.gov.au/business/industry-codes/horticulture-code-of-conduct offers practical information on the following areas:

- Trade covered by the Horticulture Code
- Rights and responsibilities of traders and growers under the code
- A horticulture trader's terms of trade
- Horticulture produce agreements
- Statement to growers
- Good faith under the horticulture code
- Dispute resolution under the horticulture code
- Recording keeping under the horticulture code
- Horticulture code enforcement and compliance checks

# Project Reference Group

**The Australian Mangoes Communication and Extension Project Reference Group has been formed and met for the first time in Mareeba on 29 August 2022.**

The Project Reference Group comprises members who bring knowledge, skills, and experience relevant to supporting the AMIA Communication and Extension projects to improve the productivity, profitability and sustainability through improved capability, innovative culture, demand creation and more consistent quality.

### The members are:

- Marine Empson: AMIA, Extension Project Lead and Chair
- Gabby Taylor: AMIA, Communication Project Lead
- Sarah Strutt: Hort Innovation
- Dale Bennett: Queensland Department of Agriculture and Fisheries
- Michael Finey: Northern Territory, Department of Industry, Tourism and Trade
- Melanie Ford: Western Australia Department of Primary Industries and Regional Development
- Debbie Nucifora: Far North Queensland Grower Representative
- Kristian Pucciarmati: North Queensland Grower Representative
- Stephen Scurr: Northern Territory Grower Representative
- Aditya Chittu: Western Australia Grower Representative
- Kayla Castorina: Communication and Extension Professional
- Andrew Burns: AMIA, Supply Chain Representative

### The Project Reference Group aims to provide:

- Input to the development of the projects' extension and communication strategy
- Input to the planning and subsequent review of annual workplans of all communication and extension activities
- Recommendations to adapt and improve future extension and communications plans.
- Tactical advice and support to ensure the projects meet their objectives
- Advice to ensure that the interests and needs of the mango industry are addressed
- Insight into where the projects can build on and add value to complementary activities or events
- Champion the projects.

We thank all PRG Members for contributing their time and inputs to the PRG process, particularly with respect to their desire to ensure the best possible outcome for the Australian Mango Industry.

If you have any questions, please contact the Industry Development Manager and Chair, Marine Empson.

*Project Reference Group.*

# Chemical updates

For the latest Chemical Update from Hort Innovation head to: https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/mt20007/.

The following permits have been issued by the Australian Pesticides and Veterinary Medicines Authority (APVMA):

| Permit ID | Description | Date Issued | Expiry Date | Permit holder |
|---|---|---|---|---|
| PER92133 | Tetraniliprole (Vayego 200 SC Insecticide) / Mango & Lychee / Mango shoot looper (Post-Flowering only) (NSW, NT & QLD) | 10-Aug-22 | 31-Aug-25 | Hort Innovation |
| PER92765 | Fipronil / Mango trees / Giant Northern Termite (QLD & WA) | 26-Aug-22 | 31-Aug-25 | Hort Innovation |

All efforts have been made to provide the most current, complete, and accurate information on these permits, however we recommend that you confirm the details of these permits at the following APVMA website: https://portal.apvma.gov.au/permits.

A Non-Performance Reporting Form for Horticultural Pesticides* should be completed when an adverse experience occurs as a result of using the permit.

Please return the Non-Performance Reporting Form for Horticultural Pesticides to: jodie.pedrana@horticulture.com.au.

If you require any 'non-performance' information to be provided to the APVMA, please complete their On-Line Adverse Experience Report Form. This can be found at: http://apvma.gov.au/node/311 or https://portal.apvma.gov.au.

Users are advised that while the pesticide can be applied legally under the APVMA minor use permit, there can be a significant delay until the MRL gazetted by the APVMA is adopted in the Australia New Zealand Food Standards Code.

Until this occurs the MRL may not be recognised, and a zero tolerance may be imposed for residues of the pesticide resulting from its use according to the APVMA permit. Please be aware that in the absence of an MRL in the Food Standards Code, the use of the pesticide according to the permit may result in the suspension of the produce in the marketplace. Please check the FSANZ website or the Australian Government ComLaw website: https://www.legislation.gov.au/Series/F2015L00468 to confirm if there are MRL established by the Australia New Zealand Food Standards Code.

*These Chemical Updates are part of 'Mango industry minor use program MG16004'.*

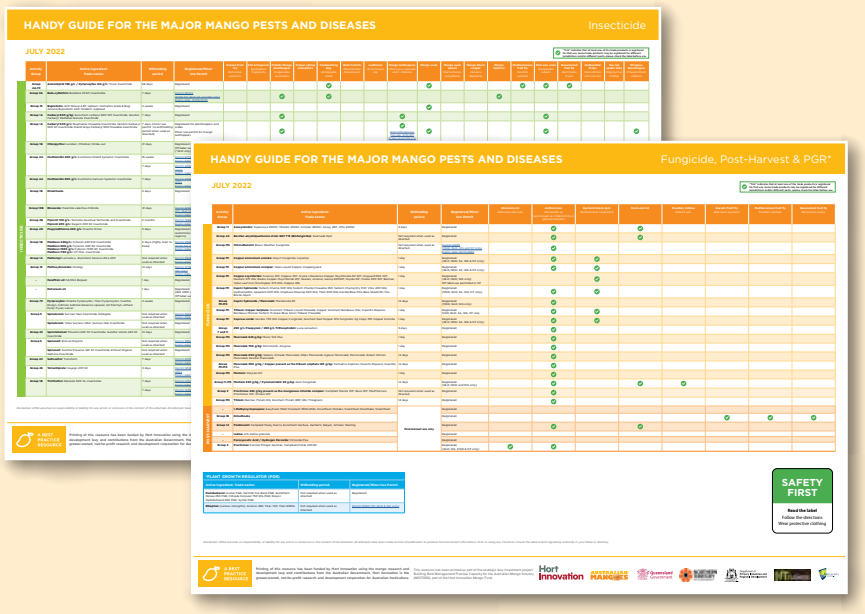
**A 'non-performance' is an unintended or unexpected effect on plants, plant products, animals, human beings, or the environment, including injury, sensitivity reactions or lack of efficacy associated with the use of an agricultural chemical product(s) when used according to label (or permit) directions.*

# Chemical posters

Printed and online versions of our new chemical posters are now available. The handy guide for the major mango pests and diseases provides an overview of the approved insecticides, fungicides, post-harvest, and plant-growth regulator chemical products available to the mango industry.

The online version can be found on our website in the Resources section: https://www.industry.mangoes.net.au/resources/resources-library/chemical-posters-now-available/

Please contact our Industry Development Officers, Paige or Celine, to request printed copies or for access to the excel version.



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# PEOPLE & EVENTS

# Pre-season Roadshows

**It has been a very busy lead up to the 2022/2023 mango season with our pre-season roadshows taking place in the Northern Territory and North Queensland.**

With COVID-19 impacting our ability to meet face-to-face over the past two years, it has been great to be able to bring growers, industry stakeholders and the AMIA together again to discuss pertinent issues for the industry and the challenges and opportunities for the season ahead. Through the hard work of our Industry Development Officers, Celine Jordens and Paige Liebich, and our Industry Development Manager, Marine Empson, the AMIA has been proud to present these roadshows and has been impressed with the overall grower and stakeholder turnout.

Roadshows have covered the Kununurra, Darwin, Katherine, Mareeba and Bowen/Burdekin regions and also offered an opportunity for the Project Reference Group to meet face to face.

Presentations at the roadshows covered a wide range of topics including:

- Updates from the AMIA team on the extension and communication projects, marketing, new resources including the chemical posters and the MRL app, and the AMIA crop forecasting process
- R&D updates on topics such as the Resin Canal Discolouration project, the Hot Water Dipping Trial and the new Mango Fruit Drop project
- New and existing technologies including probes for water use monitoring and crop forecasting tools, and the exhibition of the machine vision rig prototype
- Pest and disease information and biosecurity aspects, including irradiation technology for export and domestic trade, and specific chemicals effective against current threats for mangoes
- Processing opportunities presented by Aussie Frozen Fruit

The roadshows also included a field walk at JPK Orchards with Stoller to check out a Bio-Hold trial, a field walk at Pucciarmati Mangoes with E.E Muir & Sons to discuss herbicide usage and introduce spray calibration, and a Grower-only Q&A session to discuss the challenges and opportunities for the season ahead.

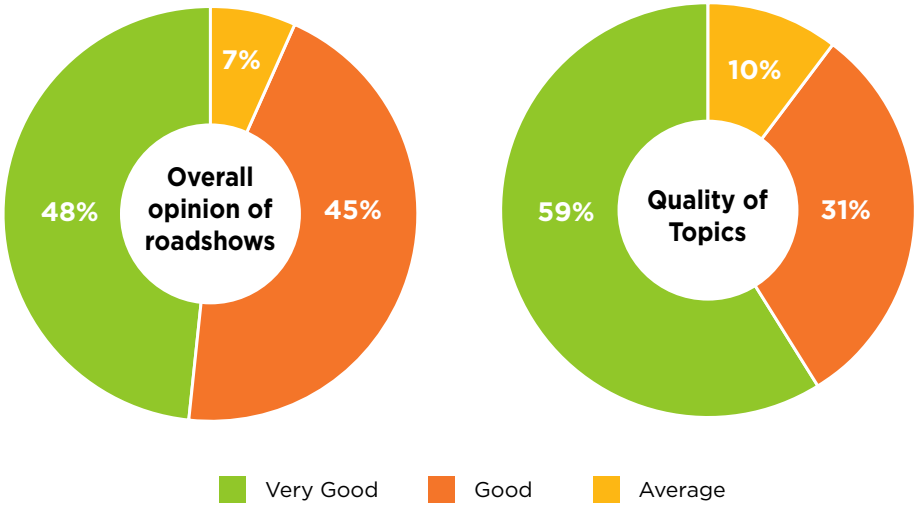
The AMIA would like to thank all the presenters and all those who have attended the roadshows, especially those who travelled to make it. Special thanks go to the roadshow sponsors, Antelco and Stoller and JPK Orchards and Pucciarmati Mangoes for hosting the field walks.

Thank you to all those who have provided feedback on the roadshows thus far.

More roadshows are still to come for QLD and WA. The AMIA looks forward to seeing you there!

*"Good range of speakers and topics. Good time for networking."*

ROADSHOW ATTENDEE









*"The diversity of the industry that was represented. Ability to speak to these people and learn about their work and how everyone's contribution makes mangoes a success."*






# PR & MARKETING

# 2022/2023 mango marketing program

**The mango marketing program for the 2022/2023 season is underway with a range of activities to help drive consumer demand for mangoes.**

The objective of the 2022-2023 Australian Mango marketing plan is to drive demand for Australian mangoes, through celebrating the glorious experience that is eating an Australian mango, communicating how mangoes are the iconic taste of Australian summer, and educating consumers on how to hedgehog a mango.

## The campaign will focus on 3 key pillars;

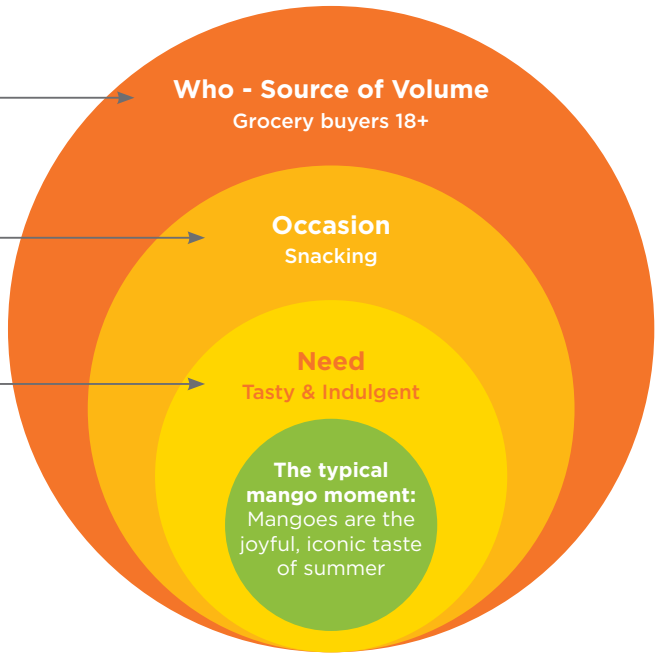
1. Celebrating the iconic joy that is Aussie mangoes through the 'Taste The Sunshine' brand campaign
2. Launching and being prominent in retail throughout the mango season
3. Sharing the joy of Aussie mangoes beyond our shores (export marketing).

## Mango Consumer Target

All buyers of the category

Snack Occasions are 43% of Mango volume, which is a slight under-representation vs 46% for All Fruit. Leverage mangoes strengths as a refreshing, sweet & fun treat within snacking. Dessert occasions are fewer at 20% of all Mango volume, however an over-representation vs 8% for All Fruit.

Mangoes over-index in both Tasty 73% vs 61% fruit occasions and Indulgence 37% vs 30% fruit occasions. Quick and easy is high at 51%, however under-index versus other fruit occasions 58%.




*Source: Kantar, Demand Spaces Research 2022.*

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| Strategic shifts to be made FY 2023-2026 | |
|---|---|
| **FROM:** | **TO:** |
| **Messy** - Mangoes are messy to prepare | I now know how to hedgehog a mango so that it's easy and fun to eat |
| **Expensive** - Mangoes are too expensive | Mangoes are a tasty & indulgent way to treat myself and my loved ones because we're worth it |
| **Mango Season** - I really like mangoes but are unsure of when the season starts | I can't miss the start of the season when I shop instore or online |
| **Retailer** - With the gap between seasons, there's work to be done to ensure we're ready for the season | I've made mangoes a key priority throughout their season |
| **Export** - I don't buy mangoes from Australia | I love buying premium Aussie mangoes grown by trusted Aussie farmers |

| STRATEGIC PILLARS | PILLAR 1 | PILLAR 2 | PILLAR 3 |
|---|---|---|---|
| | **Celebrate the iconic joy that is mangoes** | **Be unmissable in retail over the mango season** | **Share the joy of Aussie Mangoes beyond our shores** |
| **KEY ACTIVITIES** | Taste the Sunshine campaign (Include hedgehog)<br>Season announcement launch PR (Include hedgehog) | Season launch and ongoing visibility in-store: Incentives & POS<br>Online retail plan | Direct to Consumer Advertising NZ<br>Current / Emerging Markets B2B focus |

## TASTE THE SUNSHINE

The Taste the Sunshine campaign will continue to be promoted this season enabling continuity of messaging. The campaign will remind Australians that Australian mangoes are available and educate consumers on the delicious and fun reasons they should consume an Aussie mango this season.

The focus for this years' key campaign visual will move from a whole mango to a 'hedgehoged' mango. The visual illustratively helps overcome the barrier for some consumers that mangoes are difficult to prepare or messy, providing inspiration of a simple preparation technique.

The campaign will be live across a range of mass reaching, complementary media channels throughout the season, to drive consumer awareness and demand through education and inspiration.

## MASS REACHING MEDIA

### (pre-store mental triggers)

Mangoes are purchased mainly on impulse. The marketing approach for mangoes covers multiple mediums to ensure we capture the attention of passing consumers, be it on foot or online.

Through the use of targeted search criteria on social media platforms, such as YouTube, or Facebook, potential consumers will be reminded through advertising to purchase an Australian mango.

Throughout the season, over 1,200 advertising panels will deployed to shopping centres and positioned outside of supermarkets, showing the Australian mangoes messaging to remind consumers to indulge in an Australian mango.


*Australian Mangoes signage to be used in store promotions.*

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## PHYSICAL AVAILABILITY
### (in store)

The key to success will be the placement of highly visual, large, and well-stocked mango displays in prominent front of store locations. Retailers will start to place Australian mangoes via large displays in central and prominent locations from early October. Some retailers will also support creative display and volume related competitions to ensure their operational store staff get behind the excitement mangoes brings to their produce departments. This will ensure that consumers are encouraged and will have every chance to purchase throughout the mango season.

## PUBLIC RELATIONS

Seasonal marketing activities have now begun, with the official mango season launch taking place at the mango auction at the Brisbane Markets on September 29. To coincide with this launch and its media coverage, the following media release was circulated (right).


*A new Mango Monarch has been crowned, with Sam Etri from Skippy's Fresh Frootz taking the coveted title of Mango King for 2022 with his $20,000 bid.*

**For further information please contact:**

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E: andrew@mangoes.net.au

Hort Innovation

## MEDIA RELEASE

## MANGO SEASON IS BACK AND IT'S JUICIER THAN EVER!

- Australian Mango season launches today, with prime growing conditions and strong flowering pre-season, forecasting bumper quality crops.
- The season commences in September, with Aussies set to indulge in over 180 million delicious mangoes in the coming months.
- The first tray of new season mangoes was sold at the 2022 Brisbane Produce Market Mango Auction, with proceeds going to charity.

BRISBANE, AUSTRALIA, 29 SEPTEMBER 2022: While summer is still months away, one of Australia's favourite fruits is about to hit our shelves, with the launch of Australian Mango season today.

Following a strong flowering pre-season, mango season is officially underway and Australians can expect to taste the sunshine with fruit now hitting supermarket shelves across the country.

National distribution levels are due to reach 230,000 trays in late September - with Aussies expected to indulge in close to 180 million mangoes over the coming months.*

"After a year of dreary weather and negative news, Australians can look forward to tasting the sunshine with the sweet tropical flavour of Australian Mangoes," said Brett Kelly, CEO of Australian Mangoes.

"The excellent growing conditions over the recent months has meant we are harvesting an abundance of fruit in prime condition. We can't wait to share these with Aussies to slice, dice and devour all the delicious, juicy goodness of our Australian Mangoes."

The season officially launched today at the annual Brisbane Produce Market Mango Auction, raising money for children's cancer charity Redkite and The Lady Musgrave Trust for homeless women.

Bec and Luke McMullin, first-generation mango farmers from Riverfarm Mangoes in the Ord Valley of Western Australia, are very excited for Aussies to embrace their perfect summer fruit.

"This season, we're encouraging Australians to try hedgehogging a mango - an easy way to prepare a mango by slicing the mango into 2 cheeks beside the seed, dicing the flesh into a crisscross pattern and then turning outward to devour the delicious and juicy taste of Australian mangoes."

High in nutritional value, easy to prepare and so juicy and delicious, mangoes are a refreshing snack, perfect for desserts and a unique addition to savory dishes.

**Why do Aussies love Mangoes****

- 87% of Australian Mangoes are enjoyed locally
- Australians purchased over 72 million mangoes in the 2021 season, up 4% versus prior year
- Over 50% of Australian households enjoyed a mango over the past year

The first mango variety shoppers can expect to see on the shelves are the delicious Kensington Pride, followed by Calypso and R2E2 in October and Honey Gold in November. The Keitt, Palmer and Kent varieties will appear from January.

Australian Mangoes will be available mid-September at all major grocery, independent and local food markets. For more information and access to tasty and easy Mango recipes, please visit https://mangoes.net.au/

**Source: https://www.industry.mangoes.net.au/cmsb/media/forecast-6-september-2022.pdf*
***Source: Nielsen, latest 52 weeks - week ending 14/08/22*

# The best post-harvest protection any mango can have is SCHOLAR®

SCHOLAR prevents post-harvest fungal disease development, maintaining fruit quality in transport and storage to increase both profitability and marketability. For further information talk to your local Syngenta representative or visit **syngenta.com.au**

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IS YOUR CROP PROTECTED? SCAN HERE

# Biosecurity, Research & Policy

# Pest and disease update

**Australian Mangoes conducted pest and disease update events in Darwin, Mareeba and Bowen.**

*"Presentations were well delivered and on point to the key information/ knowledge of interest." (Bowen)*

The Australian Mangoes team organised a series of events to update growers on the current pest and disease threats for mangoes ahead of the flowering season, and provided useful resources and material such as factsheets and booklets. Three events were held in the series, two in Queensland and one in the Northern Territory.

A mixture of presenters from Corteva Agriscience, E.E. Muir & Sons, independent consultant LW Crop Services, Bayer Australia, as well as the Entomology and Plant Pathology teams from the NT Department of Industry (NT DITT), Tourism and Trade and Queensland Department of Agriculture and Fisheries (QDAF), delivered updates and answered questions on a range of pest and disease management related topics. Growers had the opportunity to hear about the mango shoot looper, the mango twig tip dieback, integrated pest management (IPM), mango diseases and their management, plus discuss the effective use of specific agrichemicals against current threats.


*Industry Development Officer, Paige Liebich speaking in Bowen.*

## Attendees were invited to provide feedback on the event by completing a short survey online:

*"Overall, very good event since there were professionals in their own fields talking about interesting topics. The whole thing was run and organised well." (Darwin)*

*"It was done well, presenters were well-spoken and interactive. Informative session, but we need to somehow get more of the industry involved in these events (more grower representation)." (Darwin)*

*Continued page 19*


*Ian Newton, Entomologist from QDAF presenting in Mareeba*

Continued from page 18

*"Great info, speakers and venue." (Bowen)*

*"Presentations were well delivered and on point to the key information/ knowledge of interest." (Bowen)*

*"Good event – informative and timely" (Mareeba)*

*"The talks were good and relevant. Good time for this type of presentation." (Mareeba)*

Additional feedback indicated that growers welcomed the opportunity to network with each other and with other industry stakeholders. Previous surveys conducted by AMIA have also shown that growers consider speaking with other farm owners and managers to be an efficient way to exchange information relating to the mango industry, and such events provide an opportunity to do so.

All events were followed by a networking session to strengthen the relationships within the industry and encourage information sharing amongst growers.

Australian Mangoes would like to thank the speakers and partners for their participation to the event.

***"Overall, very good event since there were professionals in their own fields talking about interesting topics. The whole thing was run and organised well." (Darwin)***


*Stan Bellgard (NT DITT) presenting on the mango twig tip dieback.*

# Supply chain trial puts Mareeba pair on track

*John and Debbie Nucifora appreciate the advantages of Escavox real-time supply chain tracking, allowing them a more firm handle on quality control.*

## AT A GLANCE

- Mareeba growers John and Debbie Nucifora participated in a trial of real-time supply chain tracking over two seasons, recording a near-perfect score on their performance in year two.
- Warm loads, where products exceeded the desired temperature band, decreased from 75 per cent of tracks in 2019-20 to just 14 per cent of tracks in 2020-21.
- The data from Escavox technology has given the Nuciforas more control of their supply chain from farm to wholesaler. They are urging greater uptake of the service from distribution centre to retailer to deliver further confidence to food producers and quality assurance for consumers.

Mareeba growers John and Debbie Nucifora, have two seasons of trial data showing a near perfect management of fruit temperature throughout the supply chain.

The result demonstrates the value of benchmarking and using digital tools to verify operating procedures, assisting in continuous improvement of their business.

As Debbie explains, she and John have been growing mangoes as a successful husband and wife partnership for more than 30 years, trading as J&D Nucifora Family Trust.

They produce six mango varieties commercially, with a further 11 varieties under trial across their 72-hectare operation in Mareeba, an hour south-west of Cairns.

Their research and development focus on farm is delivering a product, marketed as Deb's Gold, that meets the expectations of consumers for flavour, texture, juiciness and visual appeal.

"We put a lot of effort into the fruit we produce and are constantly looking for ways we can improve our produce while being mindful of costs and inefficiency," Debbie said.

"We take enormous pride in our ability as farmers to produce a quality product. When the mangoes leave our farm, they are in optimum condition."

Debbie and John have confidence in the rigorous discipline they apply to soil, water, and crop management behind the farm-gate. However, they don't have the same confidence in the channel that delivers their product to market.

That lack of control and desire to validate their existing operating procedures, were their driving reasons to participate in a trial of real-time supply chain tracking across two seasons from 2019 to 2021.

Coordinated by the Australian Mango Industry Association (AMIA) as part of the levy funded project—Building Best Management Practice Capacity for the Australian Mango Industry (MG17000), the trial exclusively used the real-time tracking technology of Escavox, which captures the experience of food as it moves through the supply chain.

From their PC or smart phone, the Nuciforas were able to watch the progress of their freight as it travelled 1,700 kilometres from their farm to their wholesaler in Sydney.

From the data conveyed from the trackers to their dashboards, they could see if their mangoes were too hot or too cold, moving, or stationary, where they were located, or if they were exposed to too much light or humidity.

By the end of the two-season trial, the data about the Nuciforas 200,000 trays of mangoes made pleasant reading.

The Escavox service provides customers with a Voice of Product (VOP) score for each track monitored. The VOP reflects the percentage of time products are within the desired temperature band.

For example, during the 2019-20 season, the Nuciforas achieved a VOP of 64, meaning that for 64 per cent of the time spent in transit, their mangoes were at optimum temperature.

After making changes in consultation with their carrier, the Nuciforas recorded a VOP of 98 the following season, a 34 per cent improvement from an already high base.

*Continued page 21*

*Keitts mangoes ready for shipping.*

*The Nuciforas were able to track any temperature changes through accurate monitoring.*

*Continued from page 20*

Assisted by cooling rooms within their on-farm packhouse, the Nuciforas' pre-cooling also improved from 75 per cent in 2019-2020 to 100 per cent during the 2020-21 season.

Warm loads, where products exceeded desired temperature bands, decreased from 75 per cent of tracks (2019-20) to just 14 per cent of tracks (2020-21).

Average temperatures decreased from the 2019-20 season to the 2020-21 season, potentially increasing retail shelf-life.

The AMIA trial was the first time the Nuciforas had used real time supply chain tracking, providing information they could use to improve business practices.

"The data doesn't lie. When you're able to measure accurately, you can manage more effectively and have confidence you're taking the best approach to achieve the right result," said Debbie.

Debbie says they now have more confidence in their operation, which no longer stops at the farm gate but extends all the way to their wholesaler's warehouse.

She says there is still a visibility gap from when their product moves to another freight forwarder or distribution centre and then into the retailer's dock.

"But, if we start to see more uptake of real-time tracking at that end of the supply chain, then that will give us a very firm handle on quality control all the way from farm to the fresh produce section at store," she said.

"And that will be incredibly powerful, not just for us as the producer, but also for the consumer."

*"The data doesn't lie. When you're able to measure accurately, you can manage more effectively and have confidence you're taking the best approach to achieve the right result."*

**- DEBBIE NUCIFORA**

A BEST PRACTICE RESOURCE

This project has been funded by Hort Innovation using the mango research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

These resources have been created under the strategic levy investment project Building Best Management Practice Capacity for the Australian Mango Industry (MG17000), part of the Hort Innovation Mango Fund.

# The Australian mango harvest aid—a story in the making

*This article was first developed for and appeared in Australian Tree Crop Magazine, August/September 2022. It has been recreated here with permission.*

## HARVESTING WITH STEM

The acidic sap released when the mango 'flower stalk' is broken from the fruit will burn the fruit – and human skin, with some cultivars and some humans more susceptible than others.

The worldwide practice to avoid this problem is to harvest leaving some stalk still attached to the fruit. However, these stem ends can puncture the skin of other harvested fruit, and accidentally-broken stalks release sap, reducing the quality of the fruit. Fruit is then individually destalked then placed stem end down on racks to allow sap release.

One Australian practice to avoid the careful stacking of stalked fruit into lugs (Fig. 1), with unloading and destalking onto racks in the packhouse, involved destalking fruit onto large mesh benches under trees in the field. De-sapped fruit were then collected and taken to packhouses.

In South America the de-stemming process has been partly mechanized (Fig. 2). Nonetheless the amount of care and double-handling makes this method of harvest relatively labour intensive, and thus expensive. With Australian labour, this harvest method costs around 40-50 c/kg mango.

With mango producers in low labour cost countries, the practice of harvesting fruit with stem continues. However, labour cost and availability drive alternatives in Australia – harvest labour is over AUD $25/hr in Australia but around AUD$25/day in Brazil . Only a few Australian growers, e.g., Carnarvon area growers and a few Mareeba area growers, continue the practice of harvest with stem on.

## THE AUSTRALIAN MANGO HARVEST AID

The harvest of the Australian mango crop now involves destalking at harvest. Fruit picked directly by hand is twisted to break the stem and held inverted to allow the release of sap. Fruit harvested using picking poles are manually destemmed soon after harvest. Pickers are given advice like 'treat it like a hand grenade', or 'you have three seconds' – to get the fruit into an alkali solution ('mango wash'), before sap can permanently damage the mango skin.

The traditional mango plantings involved large trees on big row spacings. To avoid use of long poles and tree climbing, one approach was to use cherry pickers. Fruit was picked into crates and the picker had to move the platform down to unload. The Le Feuvre brothers added long tubes from the picking platform down to on ground bins. Mango wash was sprayed into the tubes but fruit quality still suffered.

Today Hydralada offers a wheeled or tracked specialty cherry picker with two 20L mango wash tanks and an integrated forklift to carry a field bin. The operator picks into a sprayed bin mounted on the picking platform, with the platform lowered to empty to the field bin.

Another approach was the development of the Australian 'harvest aid'. Ben Martin of Martos Mangoes in Bowen reports the first 'harvest aid' in the Bowen region was developed by Robert Vennard in 1995. A Holden ute chassis was used, with a small corrugated-iron tank holding alkali water used to irrigate an angled tarp that ended on 20 kg field lugs. Fruit rolled from the tarp into the lugs. Martos built their first self-propelled harvest aid in 2002.

Haig Arthur, former owner of Acacia Hills Farm and a pioneer of the NT mango industry from the early 1990s, purchased one of the early picking machines from the Le Feuvre brother's, modified it and EZY Harvester was born in 1998. Ken Le Mesurier was an early

*Continued page 23*

*Figure 1. Mango fruit harvested with stems. Note care in packing fruit in the 20 kg lugs to avoid breakage of stems.*

*Figure 2. Loading fruit to a mechanical destalker (left). Fruit is positioned with stem facing down, through a hole in the cup. A cutter bar running under the cups leaves a stem stub (right).*

Continued from page 22

picking aid builder in the NT with some units continuing in use, for example, by Skliros Produce.

Haughtons Engineering of Giru began producing one sided harvest aids with a picking platform and conveyor in 1999. Other regional engineering works also entered the field, including Davey group in Toowoomba, Mackenzie Hydraulics & Engineering in Atherton, Total Ag&Fabrication in Acacia Hills, NT, and Greentech in Adelaide, SA.

Early picking machines allowed picking from one row side only and usually had platforms for operators to work into the upper canopy of tall trees (Fig. 3). The systems often used a vertical angled tarp and a horizontal tarp sprayed with mango wash solution, with fruit thrown into the vertical tarp rolling across the tarps.

Early self-propelled machines usually had one tarp on a horizontal platform and were used with lower height canopies. In the early units, fruit rolled into 20kg crates which needed to be shifted manually into 250-300 kg wooden bins carried on the back or front of the machine. Later, this step was automated with conveyors and roller beds transporting the fruit directly to the bins. Plastic 400kg capacity bins also replaced the wooden bins, and hydraulics were added for bin lifting.

To generalise, most machines now allow for double sided picking. Now harvest aids come in 'all colours', driven by bespoke requirements of individual farms (Fig. 4). Perhaps the most fundamental design difference is in the choice of spray-to-waste or recirculation of mango wash. The required tank capacity is reduced in a recirculating system, but the potential for skin damage is increased, as sap builds up in the solution.

*Figure 3. Total Ag and Fab self propelled one sided units with platforms for picking into the upper canopy – used on a farm with tall canopy and narrow inter-rows.*

Design variations across the current fleet of Australian mango harvest aids include:

- Spray to waste or recirculation
- Length of unit – shorter for easier turning at end of row, longer for larger picking crews
- Tractor pulled or self-propelled, and if self-propelled 2- or 4-wheel drive or tracked
- Hydraulic or manual brakes
- Drive speed (slow for harvesting, faster for movement between orchards)
- Use of a final freshwater rinse to remove mango wash
- Use of hydraulic rams to level the picking platform when on sloping ground
- Use of picking platforms (with taller canopies)
- Whether fruit are thrown or placed onto the aid, which impacts the choice of the receiving surface, e.g., loose or tight tarp, stainless steel sheet or a conveyor
- Use of vertical over horizontal tarps where fruit are thrown into the aid
- System for carriage of empty field bins
- System for tilting of the field bin as it fills
- Automated lifting of conveyor belts to access hard to reach areas for cleaning
- Alarm systems for engines and machine functions, including safety switches, horns and cameras
- Flood lighting, allowing for night harvesting
- Seats and shade structures for operator comfort

Continued page 24

*Continued from page 23*

- Storage areas for staff's person effects, drinking water and picking sticks
- Location tracking systems to see position on farm.

Large farms now maintain fleets of a dozen harvest or more aids.

In a casual consideration, a harvest aid is an inefficient investment – at over $100,000 for a self-propelled unit for an item used across a harvest season of approximately 8 weeks of the year. However, there is a strong driver in the reduction in harvest labor cost from 40-45c/kg to 10 to 25c/kg, depending on tree architectures, fruit load and harvest aid features.

With harvest of 12 tonnes of fruit per aid per day, payback within two seasons is expected. The instant tax write off on assets of recent years is a bonus.

**Article prepared by Kerry Walsh, Somu Bhattacharya, Martina Matzner***

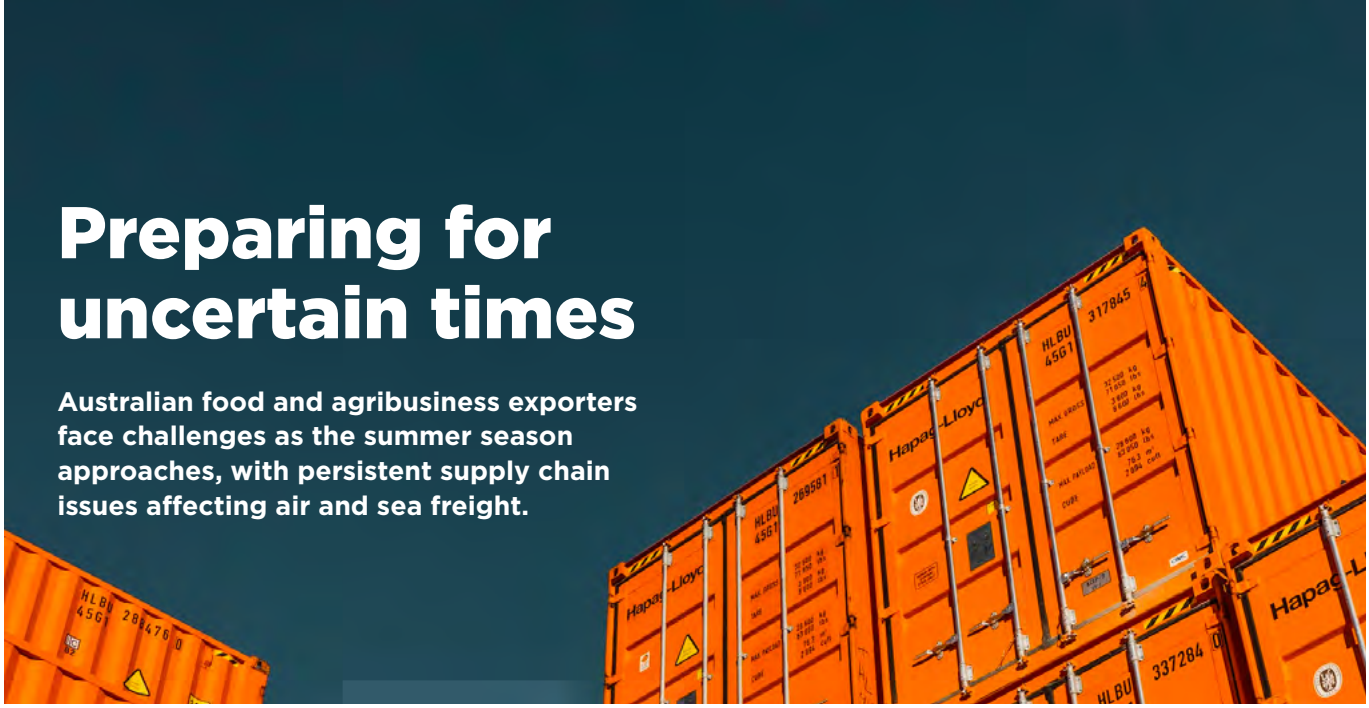
**Kerry Walsh is a Professor – Plant Sciences, CQUniversity Rockhampton. Martina Matzner is an independent technology adoption advisor, who submitted a thesis on mango production as part of her university studies in Germany before coming to Australia, where she became involved in the development, and management of a large mango enterprise near Darwin. Somu Bhattacharya is a Masters student involved in the CQU mango research project on robotic harvesting.*

*With harvest of 12 tonnes of fruit per aid per day, payback within two seasons is expected. The instant tax write off on assets of recent years is a bonus.*

*Figure 4. Mango harvest aids come in 'all colours', built to the bespoke needs of each farm*

# Preparing for uncertain times

**Australian food and agribusiness exporters face challenges as the summer season approaches, with persistent supply chain issues affecting air and sea freight.**



A confluence of global issues – including international conflicts, labour shortages and industrial action, with added complications presented by the pandemic – are placing increased pressure on supply chains and limiting freight options for Australian exporters.

While the number of outgoing flights are steadily improving since international borders opened, this has been offset by staffing shortages resulting in delays and cancellations.

Sea freighting also continues to present a challenge for Australian exporters sending goods to market, with ongoing congestion, blank sailings and food-grade container shortages expected well into 2023-2024.

In short, the future for reliable air and sea freight remains in flux.

But there are things exporters can do to help minimise the impact to their businesses, according to former International Freight Coordinator General and current Export Supply Chain Services (ESCS) Principal, Michael Byrne.

"It is a really tough time for exporters, and based on everything we're hearing and seeing, it won't get much easier in the short term. Businesses need to be doing everything they can to keep on top of developments as they plan for summer – being flexible and building contingency plans will be crucial," Mr Byrne said.

With the International Freight Assistance Mechanism (IFAM) - a temporary, targeted, emergency support measure to keep global air links open in response to the effects of the COVID-19 pandemic - ending earlier this year, there remains a pressing need for strategic supply chain, freight and logistic insights and intelligence.

The ESCS is a new initiative by the Australian Government to provide insights on complex supply chain and logistics issues to agribusiness, food and beverage exporters, government partners and other stakeholders.

The program aims to help industry navigate global supply chain challenges to build resilience and the ability to capitalise on opportunities that emerge as the global economy recovers.

Since launching in August 2022, the ESCS, administered by the Australian Trade and Investment Commission (Austrade), has gathered intelligence from dozens of experts, leveraging the know-how and experience of freight and logistics specialists and contacts to fully digest the full scope of current and emerging supply chain issues.

Over recent weeks and months, the ESCS team has met with stakeholders from individual businesses, industry associations and government, and the overwhelming feedback has been that unpredictability is the biggest pain point for exporters, usurping concerns over costs.

Tackling these many challenges will require long-term, structural solutions across the sector and the results will take time to fully emerge.

However, there are strategies individual businesses can and should be using to reduce the impact of ongoing unpredictability, including:

- **Stay informed.** In a rapidly changing environment, it is important to stay informed. Set up simple news alerts and subscribe to a variety of sector specific sources. For example, ESCS produces a fortnightly Supply Chain Snapshot, available on the ESCS webpage.
- **Strengthen relationships with Freight Forwarders.** Pre-pandemic, exporters could take a "hands off" approach, but as supply chains get more complex, so should your relationships. Lean in, get involved and get informed to make the best freight decisions for your business.
- **Be collaborative.** Work within your sectors to demonstrate demand for certain legs / routes. For example, in 2020 government and industry worked together to demonstrate demand for Tassie exports over summer and as a result, Cathay Pacific stood up the first direct international cargo flight (HOB-HKG) in 20 years.
- **Expand your horizon.** Are there alternative markets you should be exploring? Are there alternative routes you can utilise. There may be more transhipment / hub options through Singapore, Hong Kong or Dubai.
- **Consider your contracts.** For example, be cautious of locking in long term contracts right now - in the short to medium term, pricing conditions for exporters look favourable for both air and sea freight.
- **Be pragmatic.** We know there is a shortage of 20ft containers in Australia, but an excess of 40ft options. Is it possible to change your operations to use 40ft?

For more information on the Export Supply Chain Service (ESCS) and the latest air and sea freight developments, visit https://www.austrade.gov.au/escs

# Giving Australian mango diagnostics a booster shot

**Each day, mango growers deal with a variety of plant pests and diseases on-farm. But beyond our borders, there are a number of significant biosecurity risks that pose a threat to Australian mangoes, and with increasing tourism and trade, the risk of new pests and diseases entering Australia is likely to increase. In this article, Boosting Diagnostics Project Officer Maddy Quirk interviews the Northern Territory Government Department of Industry, Tourism and Trade's Dr Sajal Fatima Zia about two cutting-edge research projects on key mango diseases.**

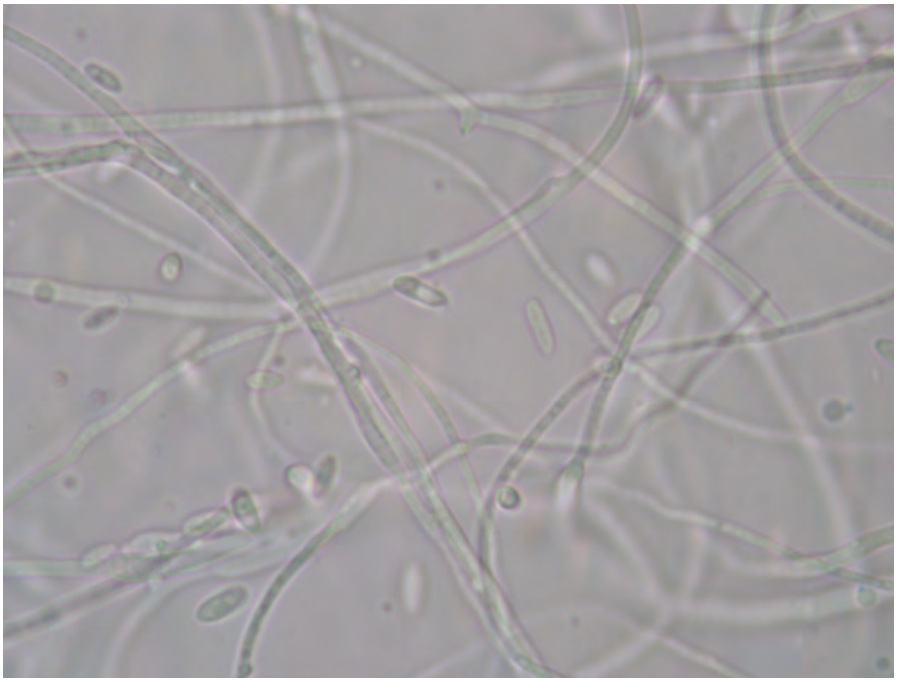
To be able to rapidly identify potential risks, and stay on top of pests that are already here, modern, quick, and accurate diagnostic tools need to be available to growers, industry and scientists Australia-wide. So in 2019, the Department of Agriculture, Fisheries and Forestry's Rural R&D for Profit program project Boosting Diagnostic Capacity for Plant Production Industries commenced. Led by the Grains Research and Development Corporation, the project seeks to increase Australia's ability to detect, contain, and eradicate plant pests and disease outbreaks.

The project focuses on a variety of target plant pests and diseases affecting a broad range of plant industries. These range from cyst nematodes of the genus *Heterodera* (pests of grains and vegetables), to *Xanthomonas citri* subsp. *malvacearum* (the cause of bacterial blight of cotton), to spotted wing drosophila (*Drosophila suzuki*; a potential threat to berry and wine production), among many others. While the subprojects are varied, they contribute to the same common goal of improved diagnostics.

The Northern Territory Government's Department of Industry, Tourism and Trade (the department) is working towards this common goal, combating significant threats to Australia's mango industry. Specifically, department Research Scientist Dr Sajal Fatima Zia is focusing efforts on **mango malformation disease and mango twig tip dieback**.

## What are these two diseases and why are they considered threats?

Common mango dieback and anthracnose are among the most common and serious diseases of mangoes worldwide. Emerging "cryptic" diseases of Mango include mango twig tip dieback (MTTD) and mango malformation (MMD). MTTD was first detected in Northern Territory in 2017 in multiple mango orchards. The most common symptoms are a black longitudinal lesion on one side of the twig. This is unlike the 'common dieback' of mango in which the progressive and downward drying out of the whole twig is seen. The Botryosphaeriales which are a large fungal group are known to cause common dieback on mango trees. However, unlike common dieback, the causal agent of MTTD is not known. The twig tip dieback is considered a threat to mango trees as it progressively causes the death of the twigs and can potentially affect fruit production. On the other hand, mango plants and trees affected by MMD show abnormal growth of flowers, leaves and shoots that result in stunted growth and reduced fruit yield. Considering how significant the mango industry is to the economy of Australia, we need to understand the identity and biology of the pathogens responsible for these two emerging disease-threats.



*Microscopic view of an isolate of Fusarium sp. Nov showing hyphae and microconidia structures. Photo credit (all images): Sajal Zia.*

## What work is the department undertaking on these diseases?

The department is involved in a wide range of projects to undertake work on mango twig tip dieback and malformation diseases. These involve providing general diagnostics services to the NT public, as well as conducting internally and externally funded research projects. The general diagnostic service involves a stringent workflow from receiving samples that are suspected to show malformation or twig tip dieback symptoms. The samples are then further investigated for the suspected pathogens by experienced plant pathologists. The suspected pathogens

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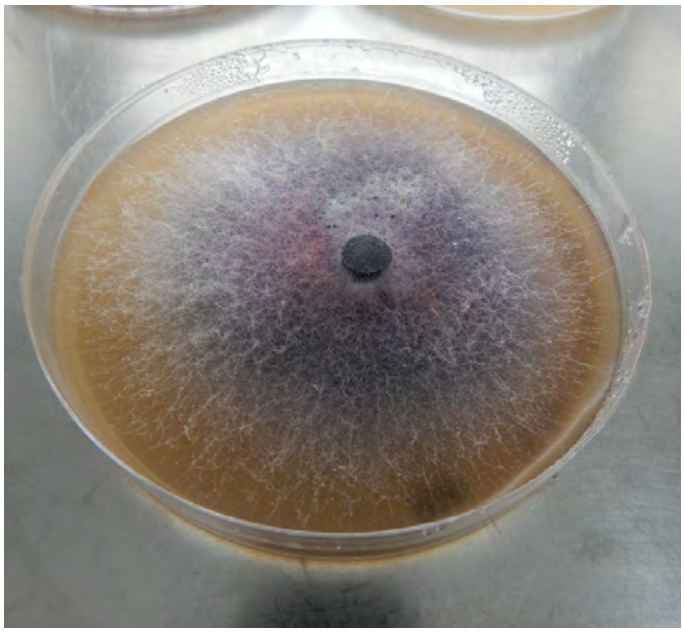

*Growth of a Fusarium sp. nov isolate on a potato dextrose agar medium. Location: Plant Pathology Laboratory.*

*Black coloured lesion on a mango twig suspected to be affected by dieback. Location: A mango orchard.*

*Continued from page 26*

are then examined for identity using specific molecular diagnostic tests. The NT DITT- GRDC research project aims to identify the bacteria and fungi associated with the diseases.

## What does your day-to-day work look like?

The best part about my job as a Research Scientist at the department is that there is a lot of variety and no true typical 'day-to-day' work. My week is a mix between laboratory and desk work. There are days where I can spend the whole day studying the bacterial and fungal cultures under the microscope or extracting DNA and performing PCR tests in the molecular biology lab. These are the days which I call the wet-lab days and are usually spent shuttling between the plant pathology and molecular biology laboratories. Then there is a waiting period in which the organisms need their time to grow or I am awaiting molecular test results. This is the period when my days are spent at the desk analysing data from previous experiment results using sophisticated computer software. The desk work also involves reviewing scholarly scientific literature to keep myself abreast of current developments and preparing manuscript drafts for publications. I also take this time to plan my next lot of experiments and making sure I have all that I need for the experiments to run smoothly. In addition to lab and desk work, there is great deal of communication involved on a daily basis with the entire team of plant pathologists, data analysts, molecular and entomology staff at the department. I also jump at opportunities for field work which mostly focus on pest surveillance and can take from a day to up to 2-3 days. The field work is also varied as one week I might be in a mango orchard, the next field visit I am in a sandalwood plantation and next visit I see myself in a cotton field looking out for pest and pathogen symptoms as the department focuses on work to support our local industries. However, with so much variety in my day-to-day work, one thing that remains constant is that I learn new and exciting things every single day.

## Where is the research at for both diseases?

The research for both the diseases is in its infancy. My research aims to identify the causal agent of mango twig tip dieback. So far, I have identified microorganisms (both bacteria and fungi) that are likely to be associated with mango twig tip dieback. This was the crucial first step to find the players linked with this disease. From past research by other international scientists, it is known that many species of the fungus Fusarium have been found to be associated with malformation disease. These include *Fusarium mangiferae*, and *Fusarium sterilihyphosum*. The plant pathologists at the department identified a new species designated as Fusarium sp. nov. that was recovered from plants displaying malformation symptoms. The aim of my research with this disease is to understand more about *Fusarium* sp. nov. (where *'nov.'* stands for novel) in terms of its features such as optimal growth temperature and morphological characteristics of it spores and life cycle, and its relationship to the other known species associated with MMD.

*"Common mango dieback and anthracnose are among the most common and serious diseases of mangoes worldwide."*

DR SAJAL FATIMA ZIA

The research with this disease is progressing well where I have collected preliminary data for the morphological features of *Fusarium* sp. nov. and DNA sequence data from a range of genetic loci. Understanding the pathogen that is causing the disease is a prerequisite in deciding the best disease management practice so that we can support the Northern Territory and northern Australian mango industry.

## What is the next step in the research?

Now that I know the bacteria and fungi associated with the mango twig tip dieback, the next step in the research is to understand their behaviour in response to fluctuating environmental conditions. Why is this important? It is because there are many contributing factors for a disease to occur and a pathogen is just one tip of the "disease triangle". Other factors include the health of the plant and the environmental conditions such as temperature, humidity, nutrition, irrigation frequency and use of growth regulators. For example,

*Continue page 28*

*"If anything suspicious is seen it is best to report it immediately. The suspected samples are then processed for pathogen identification."*

DR SAJAL FATIMA ZIA

*Continue from page 27*

if the plant gets stressed because of extreme temperature, this can result in a loss of resistance to plant pathogens, which favours the pathogen to cause disease. With regards to research into mango malformation disease, the next step is to use the DNA sequences from Fusarium sp. nov to create what is called a phylogenetic tree which will give information about its relatedness to other known species associated with MMD. These experiments will help in developing a species concept, which will support the naming of the new species.

## How is this research helping industry?

The research findings are increasing the awareness of Northern Territory mango growers about the disease and the associated pathogens. In the near future, the research will help the industry in deciding the best disease control or management practices to employ. For that to occur, it is first imperative to understand the diseases and the role of contributing host- and environmental factors through applied research on the host-, pathogen and growing conditions. This understanding is the most relevant for the growers, who need to make decisions to maximise orchard productivity. Scientists from NT DITT hold regular information exchange sessions with peak industry body groups, to share the research findings and discuss other planned activities with partners, including those from the Australian Mango Industry Association. It is a team effort between the department researchers and the industry partners. In fact, both are helping each other to achieve the common goal of how to effectively manage these diseases and to support Northern Territory growers.

## What advice can you give growers if they suspect something unusual in their mango crop?

I would advise them to just let us know! The general diagnostic facility at the department is open to not only growers but to the general public. If anything suspicious is seen it is best to report it immediately. The suspected samples are then processed for pathogen identification. The entire process of rapid reporting and identification is important to limit the establishment and spread of a potential threat. Growers and public can also call the Exotic Plant Pest Hotline on 1800 084 881 if they see something unusual.

## Do you have anything to add?

Good and accurate science takes time, which is what the department is focused on. What is important is to keep the channels of communication open between the department's researchers and the industry bodies, including here in the Northern Territory and the northern growing regions of WA and QLD.

Each Boosting Diagnostics sub-project is a small piece of a larger puzzle. As each one falls into place, the picture of what improved diagnostics and better biosecurity looks like for Australia's plant production industries will begin to take shape. For more information on the mango-related project, contact Sajal at Sajal.zia@nt.gov.au. For wider project information, contact Boosting Diagnostics Project Officer Maddy Quirk at science@ausveg.com.au.

**This project is supported by the Grains Research and Development Corporation through funding from the Australian Government Department of Agriculture, Fisheries and Forestry– as part of its Rural R&D for Profit program – and the Cotton Research and Development Corporation, Hort Innovation, Wine Australia, Sugar Research Australia, and Forest and Wood Products Australia.**

*The Boosting Diagnostics for Plant Production Industries project is a partnership between the Grains Research and Development Corporation; Cotton Research and Development Corporation; Horticulture Innovation Australia Ltd; Wine Australia; Sugar Research Australia Ltd; Forest and Wood Products Australia Ltd; AgriFutures Australia; Commonwealth Scientific and Industrial Research Organisation (CSIRO); Minister for Primary Industries and Regional Development (SARDI); Western Australian Agricultural Authority; Department of Jobs Precincts and Regions (VIC); Department of Agriculture and Fisheries (QLD); Department of Primary Industries (NSW); Department of Industry, Tourism and Trade (NT); Biosecurity Tasmania; Plant Health Australia; Plant and Food Research; AUSVEG Ltd; Cesar Pty Ltd; and Bio-Protection Research Centre.*

# New tools to assist Australian Mangoes members

**The Australian Mango Industry Association has been diligently working to enhance the experience of their members through targeted and exclusive members only tools.**

> *"This spreadsheet is just the beginning of a series of tools we are working on to help farmers understand their bottom line "*
>
> BRETT KELLY, AMIA CEO

The newest manifestation of this has been a collaboration with Cam Hogan from Dollars Making Sense and industry to create a Cost of Production spreadsheet template specifically designed for mango growers. The spreadsheet was created through extensive consultation with industry and growers.

Australian Mango Industry Association CEO, Brett Kelly expressed the association's determination to create practical tools for growers:

"Australian farmer growers produce the best quality mangoes in the world and as an industry body we hope to give those hardworking growers every advantage we can to aid their business to thrive in what are often uncertain and unprecedented times. This spreadsheet is just the beginning of a series of tools we are working on to help farmers understand their bottom line."

Grower and AMIA Chairman, Ben Martin is enthusiastic about the new tool: "It will be great as a grower to be able to not only understand your individual cost of production, but to be able to compare with regional market averages allowing for greater collaboration on best practice and a more sustainable future for all our members."

The industry body has plans in the works for both a Strategic Business Plan template and Contract template to further help its members ensure their business is sustainable and the long-term future of the Australian mango industry is secured.

To become a member of the Australian Mango Industry Association, visit their website at: https://www.industry.mangoes.net.au/

For further information about the Cost of Production Spreadsheet please contact:

**Gabby Taylor**
Australian Mango Industry Association
Communication Manager
E. com@mangoes.net.au

# Improving Australia's biosecurity toolkit

**Fast access to data and information is key to support the quick identification of, and rapid response to, the detection of exotic pests and diseases to ensure the appropriate response strategies are implemented.**

To continually improve Australia's biosecurity toolkit and to aid the effective and efficient detection of plant biosecurity risks, Plant Health Australia (PHA) in partnership with the Department of Agriculture, Fisheries and Forestry (DAFF), Museums Victoria and the Department of Primary Industries and Regional Development, Western Australia (DPIRD, WA) recently relaunched the Pest and Disease Image Library (PaDIL). Funded by DAFF, the updated and modernised version of PaDIL was developed by PHA in consultation with Australian governments.

A scientific identification tool, PaDIL is an online database containing high-quality diagnostic images and information tools designed to assist agronomists, biosecurity officers, diagnosticians and researchers both in Australia and overseas.

The diagnostic tool, hosted by PHA, contains detailed records of invertebrates, bacteria, fungi, viruses and viroids, and phytoplasmas that threaten a range of agriculture sectors, animals and human health.

The refreshed system boasts improved search functionality, a diagnostic image comparison tool for specimen triaging and taxonomic identification, and increased representation of priority pest species.

"Enhancing system integration is key to strengthening the national plant health system and using new tools and technologies drives actions that protect our market access," said Sarah Corcoran, CEO of PHA.

"PaDIL has been designed as a key diagnostic resource to increase both detection and diagnostic capability," Ms Corcoran said.

Australia's Chief Plant Protection Officer, Dr Gabrielle Vivian-Smith, said the upgraded PaDIL will assist a range of stakeholders including scientists, biosecurity officers, policy officers, farmers and citizen scientists to diagnose plant pests and diseases.

"The system will support further scientific research and activities to protect against and reduce the impact of pests and diseases," Dr Vivian-Smith said.

"Australia is lucky to be free from many of the world's most damaging plant pests, and our biosecurity system helps protect us from exotic plant pests."

"This new generation PaDIL is an incredibly valuable tool, providing the most up to date resources to aid and accelerate diagnostics, which is essential for an efficient and effective biosecurity response, as well as research," said Dr Sonya Broughton, DPIRD, WA Chief Plant Biosecurity Officer.

Visit the PADIL website for more information: https://www.padil.gov.au/

Find out more about plant pest and disease risks: https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/plant

*Cicadella viridis.*

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