

*R&D Insights* contains the latest levy-funded R&D project updates, research findings and related industry resources, which all happen under the Hort Innovation Olive Fund.

Hort Innovation partners with leading service providers to complete a range of R&D projects to ensure the long-term sustainability and profitability of the olive industry.



Each workshop included a guided tasting of both selected samples and attendees own products, providing an invaluable opportunity for expert and peer feedback.

## Table Olive Workshops inspire local production

**Knowledge, answers and inspiration were the take-homes for more than 100 growers who participated in this year's national program of Table Olive Workshops. Organised by the AOA and presented by South African table olive specialist Linda Costa of OlivesInFact, the full-day program covered all aspects of table olive production and marketing; questions and discussion were a hallmark of every event, with attendee feedback reflecting a wealth of answers gained.**

### **Fiona Martin - Oakbrook, NSW**

Fiona Martin is a relative newcomer to olives, having purchased a small olive grove two and a half years ago. She'd had a couple of tries at table olive production prior to attending the workshop, the first "a disaster" and last year's "a success" and attended to help decide whether their family-use

production could become part of their business.

"We are thinking about doing it commercially now, depending on what's involved in getting the certification," she said.

"It was a terrific day, and full of information, but the detail of it was in a sensible order so it never got overwhelming. Linda was fabulous: she kept the information coming but with enough breaks that we could get our head around it, and was very good at not making it sound too complex.

"There was a lot of technical data but when it's explained well, you realise it's actually remarkably simple."

### **Top take-homes**

Fiona said she took away a number of 'most important' learnings, along with a heap of handy tips.

"Realising that HACCP is so important

– all the red tape that you need – and also the pH level. They were the big ones," she said.

"There were also lots of little tips: lye helps to remove bruises; higher temperature increases chemical reaction; the olive to brine ratio - with green olives to start at one percentage and build to another; whether washing is a good idea and what it does to them; what temp to store them at; even about having containers with taps at the bottom.

"I learned that even though it's a simple process, there's a lot to it in the little things, and if you set yourselves up right at the beginning, all those things make it that bit easier."

### **Group discussions**

While not something we can do at present, Fiona said the interactive nature of the workshop was another bonus.

“

*It gave us that starting point and it was just really practical”*

*– Belinda Bird, Four Brothers Grove*



Costa's approachable presentation style included one-on-one interaction, ensuring understanding for attendees at all levels of knowledge and production.

“People brought their olives along and we tasted them and talked about each one,” she said.

“It was a chance for your tastebuds to pick up ones that weren't quite right, and to work out why. For producers to get that feedback is invaluable, and I think it's wonderful to be able bounce ideas around – we're all in the same boat and have the same problems and interests etc. It doesn't happen often enough for me.

“It was just a great day – and so informative. I'd be tempted to go to another one.”

#### **Belinda Bird - Four Brothers Grove**

Tasmanian attendee Belinda Bird has “a paddock and the dreams of a grove”, along with plans to make table olives in the interim using sourced local fruit.

She arrived with “very, very limited knowledge” and her husband Rob, who had “a fair bit”. Both declared the workshop a fantastic day.

“It didn't matter if you went in with no knowledge like me, a little like Rob, or heaps, Linda was really interested in where we all came from and seemed excited to have us there and to share the information with us,” she said.

“Rob already had some fermenting in the cupboard and as a chef he had a bit of understanding of the processes, but neither of us had the depth of knowledge going in that we came out with.

“For Rob, understanding the lye was really good - he had a few little lightbulb moments there - and I found

the tasting very beneficial. I don't actually like eating olives but I was able to differentiate between the various types and Linda was able to explain what was going on. I'm trying to be a bit more out there with appreciating them, and becoming more familiar with what happens to the fruit has helped with that.

“Overall, it gave us that first starting point and it was just really practical. Linda made it sound like it could be an easy thing to do: the flavour is in the olives, you don't have to do too much.

“

*I've had a problem and I didn't know what it was, and after 20 years I learned”*

*– Margie Carter, Parafield Olives*

“And it was really comprehensive. There were people who had been doing it professionally for a really long time and I swear they walked away with new stuff, while Rob and I got in the car just buzzing and he said ‘we could do this and this and this’.

“I pay hundreds of dollars to go to

nursing conferences and don't come away with as much as we did on that day.”

#### **Industry passion**

Belinda also said she gained a lot from the group discussions on the day.

“A lot of what came out of the session was that people aren't doing it for the money; they're doing it for the passion and what they can put on the plate – although a lot are looking to diversify for viability,” she said.

“It was good to get a sense of the different positions people are in, and that they're looking at new and innovative ways of production. We could draw from all the experience in the room, hear the good, bad and ugly, and we still walked out passionate about doing it.”

#### **Sandra Brajevic, Barfold Olives**

In contrast, Barfold Olives owner Sandra Brajevic has been producing table olives for 20 years but still took away a wealth of new knowledge from the workshop.

“We think ours are pretty good but we don't have a lot of scientific background - and definitely wouldn't call ourselves experts - so to have an interactive workshop where you can ask questions and present your own situation was really tempting. So I went and it was great,” she said.

“I was really interested to see someone else's take on things and to compare Linda's methods to what we currently do. Are we doing the right thing? It seems more or less we

## Linda Costa: participation and potential

Linda Costa was just as enthusiastic about the workshops, and shared her thoughts with *Olivegrower* about both the events and also the potential for Australian table olive production.

“The workshops were so well organised, in that they were offered in most of the main olive growing regions. No easy task in a big country such as this!

“The venues were well-chosen - central and easily accessible, well-equipped for meetings, and with good service. Though in some venues the coffee culture needed updating! Everyone enjoyed the informal, dialogue (rather than a monologue) format.

“I must admit that I was blown away by the number of interested participants. This was the result of great organisation and promotion by the AOA team. The level of interaction was particularly gratifying and this led to many discussions and new insights for all of us. I trust these will be on-going throughout the season.

“The good news is that consumers are asking for delicious table olives! This was repeated by many growers, hence the enthusiasm to learn how to provide the consumers with tasty, microbiologically-safe product.

“The food safety aspect was probably the most cited reason for participation in the workshops. So the basics of food fermentation were covered, and the ensuing shelf stability of the fermented olive as opposed to a ‘cured’ or ‘de-bittered’ fruit. Once this concept is understood, table olive processing becomes a delight!

“With consumers asking for product, the potential of the Australian table olive sector should be great indeed. And they have not yet even begun to appreciate the nutritional benefit of table olives - very few understand that table olives fall into the ‘raw fermented food’ category.

“The challenge is to get this message across as soon as possible, and to follow up with the most delicious product variations - bearing in mind the globally accepted definition of a table olive, of course!”

Linda Costa

[www.olivesinfact.com](http://www.olivesinfact.com)

– and “the best ever, because she talked science – I loved all those words I can’t spell!”

“She really got into the chemistry of the olive, and how and why the pickled probiotic olive is so good for you. I got really inspired by that nutritional scientific chemistry and I’ve come home and made a new poster about the nutritional benefits of olives. I’ve used the words probiotic, anti-histamine, anti-inflammatory – I got those words and that extra understanding from Linda, and now I’m going to promote my olives even more. That will be my selling point: the incredible healthiness of naturally fermented olives as opposed to those made with caustic.

“I’ll also improve my production methods. I’ve had a problem and I didn’t know what it was, and after 20 years I learned I’ve got to get the more concentrated salt in the barrel and circulate that to the top, so the salt concentration in the whole drum is at equilibrium. That’s what I’ll be working out how to do for next batch.”

### Questions and conversations

Margie said the chance to share both issues and learning is what made the workshop so valuable. “There’s hardly anybody in the world who knows as much about naturally fermented olives as Linda does, and so the opportunity to have her here is #1. She’s a lovely approachable person and it was really useful to be able to ask questions specific to your operation,” she said.

“And there were new people in the audience - new grove owners and people I hadn’t met before - and it was great to be able to have those ‘what’s-happening-in-your-grove?’ conversations with other growers.

“But most importantly, no matter who you were, you walked away with a much greater knowledge about table olives.”

### More information

For those who couldn’t attend, and participants wanting a refresher, workshop presentations and a video recording of the Adelaide event are available on the *OliveBiz* website - [www.olivebiz.com.au](http://www.olivebiz.com.au) - under the ‘Projects’ drop-down

are, but it would be good to improve a few things. So we got both a bit of reassurance and a few hints for improvement.

“We thought there would be nuggets to find that would really help us and there were a couple of those – although implementing them is still on the to-do list.

“There were good hints on the olive brine, especially the back-slopping method, where you use brine from previous batches to inoculate your new brine. You’ve got all your good bugs going into the new salt brine and you already have a good population – it makes sense but we haven’t been doing that.

“There were also good ideas about how to make your black olives

black, and that kind of thing.”

### Gaining perspective

Overall, Sandra believes industry workshops are “a gold mine” and “totally worth it”.

“If you’ve got a day spare you’ve nothing to lose and insight to gain,” she said.

“Even if your view is different to what’s presented, it’s good to get other people’s ideas and perspectives. You get some ideas, and hopefully see that you’re doing things well. That’s really valuable.”

### Margie Carter, Parafield Olives

An award-winning table olive producer for 22 years, the Canberra event was the third of Linda’s workshops Margie has attended



With no cure available for *Xylella fastidiosa* infection, early detection and response are critical for successful containment and eradication.

## Xylella controlled in Andalusia

While there is still no cure for infection by the plant bacteria *Xylella fastidiosa* (Xf), fast action by authorities in Andalusia, Spain, has proven that it can be contained and eradicated via rapid detection and a co-ordinated response.

### Background and action

In 2018 an isolated incidence of the bacterium was detected on an ornamental species in a producer nursery in El Ejido, Almería.

Ministry of Agriculture, Livestock, Fisheries and Sustainable Development personnel immediately implemented the National Contingency Plan, undertaking the seizure and subsequent destruction of all sensitive plant material in the affected nursery. As part of the Plan's conditions, the owner received compensation for the financial loss involved.

Sensitive plant material in two other nurseries that had supplied plant material to the El Ejido facility was also immediately identified and retained. Government authorities inspected all plants and crops in the three nurseries, collecting and analyzing a total of 936 samples.

In addition, a one kilometre surveillance zone was established around the nursery where the bacteria had been detected to confirm whether

the organism had spread. This area was subdivided into 401 sections of 100x100m and regularly inspected over the following two years: a total of 741 samples of 28 different plant species were collected and tested, including olives, almonds and various susceptible wild species.

During the two year surveillance period, Ministry staff also monitored the presence of vector insects known to carry Xf. Only two adult specimens of a possible transmitter were identified, suggesting minimal presence in the area, and laboratory analysis confirmed the absence of the bacteria in both.

### All-clear

With analyses of all 1,677 samples of plant material and two vector insects over the two-year surveillance period testing negative to the presence of the bacteria, the Ministry has been able to verify the absence of the bacteria in the area. It therefore recently issued notification of the eradication of *Xylella fastidiosa* in Andalusia and declared the surveillance work completed.

### Hope - and vigilance

Australia's National Xylella Preparedness Program Manager, Craig Elliott, said while this incidence reflects the importance of early

detection and response, it also provides hope for future incursions, especially as the approach reflects how we approach outbreaks in Australia.

"It's great news, as it shows that *Xylella* can be contained with an eventual return to Area Freedom," he said.

"The key point is that it seems to have been contained to the supply chain and they had the advantage of very low numbers of the vector. Compare that to Apulia, where they possibly had the infection for a few years before it was identified and had an extremely high vector population. It's not surprising that the disease took off - also acknowledging that the social resistance factor had a major role there.

"For us, I think our response structures have been well-tested in recent years and that experience gives me more confidence in how we'd manage an outbreak but again, early detection will be critical. It's imperative that growers are vigilant as to what's happening in their groves and act immediately on any concerning signs, for their own sake and for the future of the entire Australian olive industry."

Source: [www.juntadeandalucia.es](http://www.juntadeandalucia.es)

# Mapping crucial to rapid response

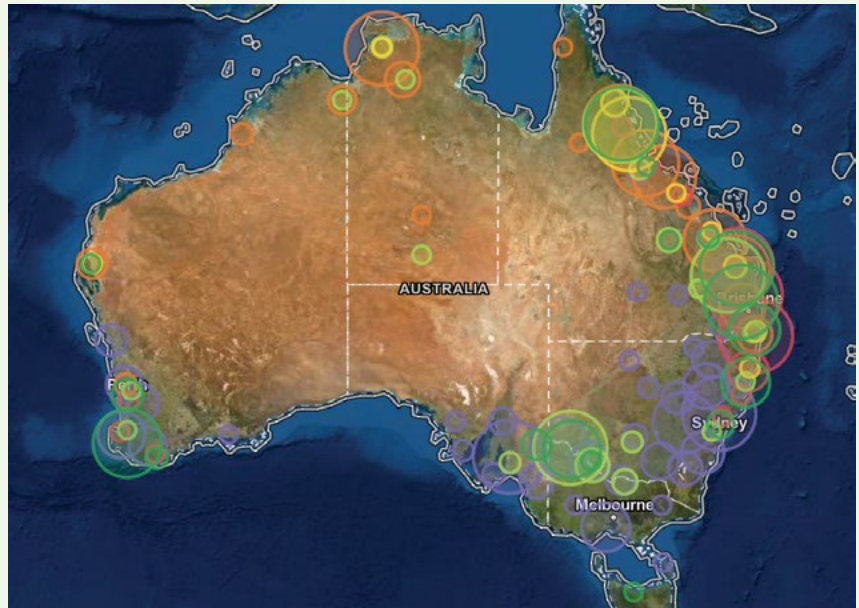
AOA CEO Greg Seymour said the Andalusian experience shows the importance of knowing where vulnerable species are when an outbreak starts.

“We need every grower to take the time to enter their data, and then encourage their neighbours to do the same.”

“When an incursion is identified, if there’s a grove out by itself and there’s nowhere else for the vector leaf-hopper to fly to, we may have a month to get it under control. In our case it’s not so bad, as many of our growers are relatively isolated, but if it happened in McLaren Vale or the Hunter you’d have a bit of a panic,” he said.

“So working out what you’re going to do, and what the necessary timeframes for action are, is very dependent on geography and that’s where the industry mapping project comes into its own. A national olive map containing grove and industry production estimates is a crucial tool for biosecurity, as it allows us to immediately identify and monitor groves within the incursion range for the pest or disease in question – including abandoned groves – and to take informed and appropriate action.

“Phase 1 of the project has seen substantial progress on the



national map and database but for true efficacy, it’s important that every olive grove in the country is represented and the details kept updated.

“So far we’ve been spared the scourge of *Xylella* but we can’t be complacent, and I’d urge all growers who haven’t entered their grove data onto the map to do so as soon as possible. We have the tools at hand to be prepared for action, and it’s vital that we all play our part in doing so.”

National *Xylella* Preparedness Program Manager Craig Elliott agrees.

“Having this sort of information is critical to a quick response and ultimately the success of a response to an outbreak,” he said.

“Too often the responders are searching for a needle in the haystack, so knowing where groves are saves them a lot of time. This means surveillance is quicker, containment has a greater chance of success and then ultimately means that eradication may be more feasible.

“We need every grower to take the time to enter their data so that it gives a complete picture, and then

“Too often the responders are searching for a needle in the haystack, so knowing where groves are saves them a lot of time.”

encourage their neighbours to do the same.”

## Enter your data and improve the map

Grove data is added to the map via the *Australian Tree Crop Rapid Response Web App*. For more information on the app, map and the tree mapping program, contact Craig Shephard at [craig.shephard@qld.gov.au](mailto:craig.shephard@qld.gov.au).

# Approval work seeks new fungicide options and resistance management

Copper-based fungicides are frequently used as a preventative in Australian olive groves, however it's important to remember that timing of application is critical to efficacy. Equally important is resistance management: when using fungicides, it is important to rotate control options to prevent development of resistance by the fungus.

To that end, the Australian Olive Association is working closely with Hort Innovation to obtain permits or registration of new chemical control options, to enable ongoing efficacious treatment of fungal diseases.

## Approved products

The following fungicides are approved, or pending approval, for use on olives for the control of Anthracnose but are also likely to be effective against *Cercospora* and Peacock Spot:

### ***Copper formulations (Group M1 fungicides): low risk of fungicide resistance developing***

There are five types of copper compounds available in Australia: copper oxychloride (Oxydul-520, Coppox-500), copper hydroxide (Kocide WP-500, Kocide Blue-350, Kocide Blue Liquid-360, Blue Shield-500), tribasic copper sulphate (green and blue coppers such as Cuprofix-200, Tri-base Blue-190), copper ammonium complexes and cuprous oxide (red copper). Products are formulated as wettable powders, wettable granules, liquid flowable suspensions or aqueous liquids. Copper products may also contain small amounts of impurities (lead cadmium etc).

Those permitted for use on olives are:

- PER11360 - Copper (Copper present as Cupric Hydroxide, Cuprous Oxide or Tri-basic Copper Sulphate). Permit to 30 November 2021. Systemic Group M1 fungicide. Withholding period: 1 day.

- Label Registration - Copper oxychloride. Systemic Group M1 fungicide. Withholding period: 1 day.

### ***QoIs (Strobilurin) fungicides (Group 11): high risk of fungicide resistance developing***

Strobilurins are part of the larger group of QoI inhibitors. Extracted from the fungus *Strobilurus tenacellus*, strobilurins represent a major development in fungus-based fungicides. Strobilurins are mostly contact fungicides, with a long half time as they are absorbed into the cuticle and not transported any further. This group includes: azoxystrobin, kresoxim-methyl, picoxystrobin, fluoxastrobin, oryzaastrobin, dimoxystrobin, pyraclostrobin and trifloxystrobin.

Those currently permitted for use on olives are:

- PER14908 - Pyraclostrobin + Metiram (Aero)/Olives/Anthracnose. Permit to 31 July 2024. Systemic Group 11 and M3 dual action fungicide. Withholding period: 21 days.
- Registered - Azoxystrobin (Amistar)/Olives/Anthracnose. Permit to 31 August 2019. Systemic Group 11 fungicide. Withholding period: 21 days.

### ***Dithiocarbamate fungicides (Group M3): low risk of fungicide resistance developing***

This group includes Mancozeb, Methan, Metiram, Propineb, Thiram, Zineb and Ziram.

- PER14908 - Pyraclostrobin + Metiram (Aero)/Olives/Anthracnose. Permit to 31 July 2024. Systemic Group 11 and M3 dual action fungicide. Withholding period: 21 days.
- Pending – Mancozeb. Group M3 fungicide. Residue trials contracted December 2017, completed June 2019. Currently awaiting APVMA approval.



Anthracnose damage. Image: Vera Sergeeva.

### ***DMI fungicides (Group 3): medium risk of fungicide resistance developing***

DMI = demethylation inhibitors, also called sterol biosynthesis inhibitors. These include tebuconazole, difenconazole, propiconazole, epoxiconazole and tetraconazole.

Not currently registered for use on olives, however tebuconazole is being considered in combination with a Group 7 chemical for control of Anthracnose in olives as part of the Luna Range trial, as below.

### ***SDHI fungicides (Group 7): high risk of fungicide resistance developing***

Fluopyram is a broad-spectrum fungicide of the pyridinyl-ethyl-benzamides ('pyramide') group, with preventative, systemic and curative properties for the control of certain crop diseases. For crop protection purposes Luna Privilege Fungicide is best suited for use in a preventative treatment program.

- Pending - Bayer Luna Range: 'Privilege' Fluopyram (Group 7); 'Experience' Fluopyram+Tebuconazole (Group 7+3), for the control of anthracnose in olives. Trial work completed February 2020. Currently awaiting APVMA approval.

### Resistance management strategies

Hort Innovation R&D Manager Jodie Pedrana said a resistance management strategy involves the rotation of use of approved fungicides from different chemical groups - hence the need to have approved alternative control options available.

“We need to be mindful regarding resistance with the Group 11 (strobilurin) fungicides, including co-formulations, and avoid overuse and reliance,” she said.

“We must ensure we have alternative fungicide groups to rotate within the system and strobilurins should not consist of more than a third of the total fungicide sprays per crop, as Azoxystrobin (Group 11) and Aero (Group 11+M3) is already used extensively for Anthracnose in olives.

“This is the reason why we are evaluating the group 7 and co-formulation 7+3 fungicides, to provide an alternative fungicide group which hopefully will also provide some activity against grey mould and provide longevity of the existing Group 11s.”

Example fungicide resistance management rotation:

- DO NOT apply consecutive sprays of solo products containing Group 11. Consecutive sprays include mixtures containing Group 3.
- DO NOT apply consecutive sprays of solo products containing Group 7. Consecutive sprays include mixtures containing Group 7.
- DO NOT apply consecutive sprays of solo products containing Group 3. Consecutive sprays include mixtures containing Group 11.
- DO NOT apply more than three Group 3, Group 7 or Group 11 sprays per season (including mixtures of Group 11+3 and Groups 11+7).

- Rotate the above with products from Groups M1 and M3.

\*Consecutive application includes from the end of one season to the start of the following season.

Note: Group M1, Group M3, Group 3, Group 7 and Group 11 chemicals are also likely to have efficacy against *Fusicladium* (Peacock Spot), *Pseudocercospora* (Cercospora) and the *Colletotrichum* (Anthracnose) fungi.



Peacock spot. Image: Vera Sergeeva.

### Grove management and spraying efficacy

AOA Agri-Chemical Permits Co-ordinator Peter McFarlane also reiterated the role of best practice grove management for spraying efficacy.

“Achieving an open tree canopy is important for both improved ventilation and good spray coverage, which is vital for the success of any spray program,” he said.

“These and other proactive grove management practices should form part of all growers’ integrated pest and disease management (IPDM) programs, aimed at increasing tree health and resistance to attack.

“Early detection and treatment - particularly before the issue becomes widespread - reduces the volume and frequency of chemical spraying programs, thus also reducing the risk of fungicide resistance.”

#### MORE INFORMATION

Signatories can access information and grove management best practice checklists in the *OliveCare*® members’ area of the AOA website [www.australianolives.com.au](http://www.australianolives.com.au).



There’s also a wealth of information on offer in the videos and presentations from the 2018 Integrated Pest & Disease Management field day program, available on the *OliveBiz* website [www.olivebiz.com.au](http://www.olivebiz.com.au) from the IPDM project page.

# Olive Wellness project gains three year extension

It's great news for all in the industry that the Olive Wellness Institute (OWI) has secured Hort Innovation funding for another three years. The new funding will allow the OWI team to continue its work educating professionals about the health benefits of olive products through to March 2023.

General manager Sarah Gray said the project extension offers a great opportunity to expand on the Institute's current work with healthcare professionals, and also to reach new audiences.

"We are delighted to have received this ongoing support from Hort Innovation," she said.

"In particular, this new round of funding will enable us to expand our education into food service, culinary nutrition and home economics/educators.

"The COVID-19 pandemic has shown us how important good immunity and overall health is to all in our communities, so it is imperative that we educate people on how they can use EVOO in cooking and enjoy the health benefits it provides as part of a daily diet.

"We are really excited to commence this new phase of the project, and to get those messages out further and to a wider audience."

## New activities

The OWI team has a lot planned already for the new project, including:

- 40+ new resources related to culinary nutrition, chef education, food service education, oil comparisons and olive oil sensory aspects;
- video content with a specific focus on food service and culinary nutrition;
- further development of the OWI website, including the addition of a dedicated food service and culinary nutrition section;



- a virtual sensory kit;
- an EVOO documentary;
- training events for food service and chefs;
- half and full day dedicated symposium events around olive products and health.
- These will complement the continuation of current activities, including:
  - new blog posts on the website;
  - new monthly podcast episodes;
  - attendance at key industry, health professional, culinary nutrition and home economics events; and

## Research Recap

**PROJECT NAME:** *Educating health professionals about Australian olive products (OL19001)*

**PROJECT AIM:** *To increase the use of olive products in the daily lives of consumers by equipping Australian health care and food industry professionals with the knowledge they need to advise about their health benefits and uses*

**PROJECT PARTNER:** Boundary Bend Limited

**FUNDING:** Hort Innovation Olive Fund

**PROJECT ENDS:** March 2023



Olive Wellness  
INSTITUTE™



Developed by the OWI during the first stage of the project, the Event Kit for Growers provides industry members with fact-based resources to use at events and local farmers markets.

- annual waves of market research.

Education and Training Project Manager Abby Dolphin said the OWI team is already focussed on the opportunities presented by the extended funding for the project.

"We are passionate about sharing health information on olive products, and with the secured ongoing funding from Horticulture Innovation we can continue to deliver olive growers and processors and healthcare professionals the high quality research, knowledge and resources they are used to accessing from the OWI."

Find out more and access all of the Olive Wellness Institute resources at [www.olivewellnessinstitute.org](http://www.olivewellnessinstitute.org).

*The strategic levy investment project Educating Health Professionals about Australian Olive Products OL19001 is partially funded by Hort Innovation, using the Olive Fund research and development levy and contributions from the Australian Government.*