



*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.

## Monitoring and mapping project steaming ahead

The collaborative horticultural industry levy project *Multi-scale monitoring tools for managing Australian tree crops (various projects)* has now moved to phase 2, continuing the development, trial and extension of technology-based crop mapping and monitoring tools to help growers in predicting fruit quality and yield, and monitoring tree health - including in the early detection of pest and disease outbreaks.

The University of New England's Applied Agricultural Remote Sensing Centre (AARSC) and NSW Department of Primary Industries are the project partners involved in the olive industry-related elements. Here they've provided an overview and update on their research, which will also enable our industry to make more informed data-driven decisions around water supply, infrastructure, planning and governance.

### Australian Tree Crop Map (ATCM)

The mapping of Australia's horticulture tree crops provides the Australian olive industry with an accurate understanding of the extent (distribution and area) of production, at multiple scales. Knowing the extent of our industry helps us to understand current and future industry growth, assists in national and regional yield forecasting, and enables us to better respond to major events such as biosecurity threats and natural disasters.



In-grove monitoring equipment is part of the range of technology-based tools utilised within the project.

Without knowing where our groves are we simply can't respond effectively.

Through this project, a map of all commercial olive groves across Australia has been developed and is now directly available to growers and

industry on the AOA website - [www.australianolives.com.au](http://www.australianolives.com.au). The mapping application shows the extent of groves across Australia, including statistics of production area summarised by state/territory and local government area.





### Is your grove on the map?

The Australian Tree Crop Map (ATCM) continues to be updated, with the goal to account for all commercial groves in Australia over one hectare in size.

Growers are encouraged to check that their grove has been mapped and if not, complete the ATCM Survey. The survey allows growers to quickly locate their grove and submit any other details for AARSC researchers to review and interpret the information, and action updates in the map.

**Note:** Privacy has been a key consideration in the project. The ATCM is built to meet national standards and no personal or commercial information is captured or published.

You can access the ATCM Survey and other applications of the map from the university's industry applications gallery - [www.uned.edu.au/webapps](http://www.uned.edu.au/webapps).



Accurate pre-harvest yield estimation is one of the project aims.

### Biosecurity response

The biosecurity response to Panama TR4 disease across banana plantations in North Queensland has proven that knowing the location of groves is essential for containment and management of exclusion zones for biosecurity events - for example, a *Xylella* incursion. Accurate, current

spatial data for the location and extent of groves is fundamental for our biosecurity preparedness. Additionally, the spatial layer of all grove boundaries supports the rapid and regular monitoring of grove health at a national, regional and farm scale using remote sensing – also invaluable information in the occurrence of a significant pest or disease incursion.

### Estimating and mapping yield variability

The project team has been trialling methods to estimate and map yield variability at tree, block and farm levels. This has included the evaluation of high-resolution imagery via satellite and airplane, combined with extensive in-field sampling.

Accurate pre-harvest yield forecasting offers significant benefit at a range of scales. At the farm level, forecasts guide grower decisions around harvesting, including labour, machinery, packaging, transport and storage requirements, as well as their own capacity to meet market demands. All of these aspects have the ability to improve profitability for growers and industry stakeholders.

At the tree level, crop health variability can be identified, facilitating management decisions to boost low performing areas as well as optimise crop inputs.

In its second season, the project has achieved yield estimation accuracies



University of New England researcher Angelica Suarez checking tree health infield.



## Do you have historical yield data?

To forecast yield early in the growing season and without infield counting, the project is also evaluating a remote sensing approach which has proven very accurate in other tree crops.

The AARSC team is seeking historical yield data for multiple different groves to enable the accuracies of this method to be determined over different growing seasons, locations, varieties and management.

If you have that level of data and would like to take part in the research, please contact project team members **Dr Angelica Suarez** at [Isuarezc@une.edu.au](mailto:Isuarezc@une.edu.au) or **Alex Schultz** at [alex.schultz@dpi.nsw.gov.au](mailto:alex.schultz@dpi.nsw.gov.au).

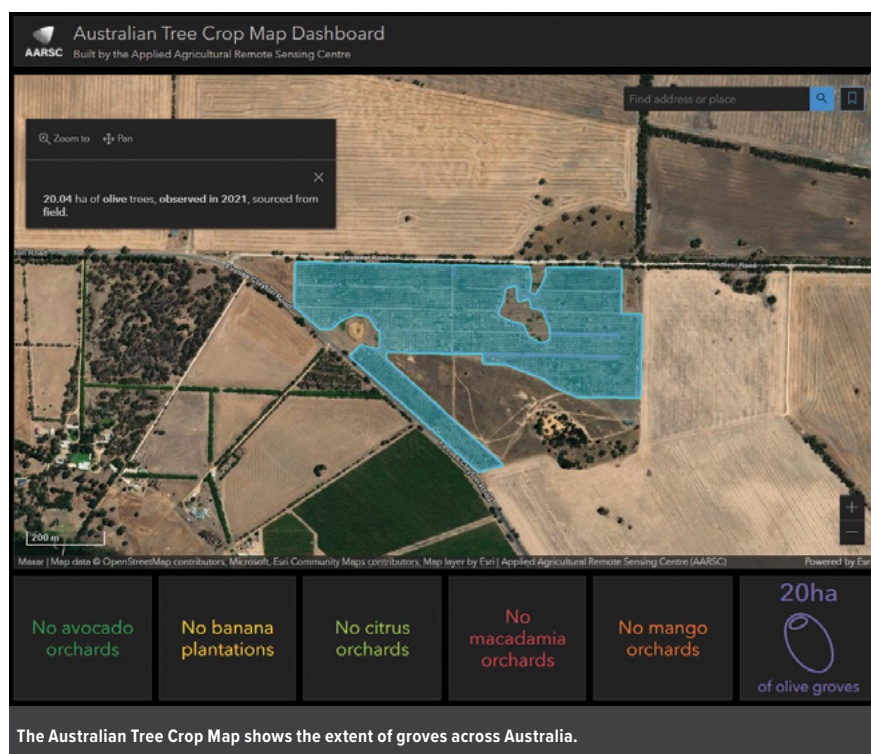
from 75% up to 99% at the individual block level (6–60 ha). These accuracies were obtained across seasons, even with the substantial yield variability identified in Picual trees (around 300%) between the 2020 and 2021 seasons.

### Grower access

The participating growers have access to yield prediction maps through web pages that are updated as soon as new information is available, allowing them to compare changes within the blocks across seasons. The ability to visually identify lower performing trees on a map and subsequently quantify yield variability in kg/tree has provided the opportunity to perform more targeted management.

### Irrigation trials

An additional part of the project, again involving collaborating growers, is an irrigation deficit trial. Involving two varieties (Arbequina



and Picual), the trial is utilising three irrigation deficits (standard practice, 75% and 50%), two vigour zones (high and low, classified using satellite imagery) and replicates of each of these treatments. The deficits have to date been imposed for two growing seasons, with the third season currently being planned.

As expected, there have been variable reductions in yield with deficit treatments (depending on variety and vigour), particularly in the second season. Areas with low vigour trees have been identified as less susceptible to water deficits, which is important if the grower needs to prioritise areas within the grove for irrigation. These findings will help guide water management decisions in years of water scarcity.

### Water stress

The project team has also evaluated a range of commercial technologies that will provide growers with an affordable, practical and accurate method for measuring early water stress. These include weather and soil moisture probes, dendrometers (measuring small fluctuations in trunk diameter), sap flow sensors, soil conductance and remote sensing provided by satellite and airborne (CERES) platforms. The infield sensors are connected through a wireless network, providing hourly readings online for timely indications of water stress.

From the results thus far, stem water potential and dendrometer measures appear to be the most responsive. The aerial imagery (using both thermal and multispectral sensors) has identified water stress across a grove. A derived remote sensing index, which is normalised by temperature and tree vigour, has provided estimation of stress across the site.

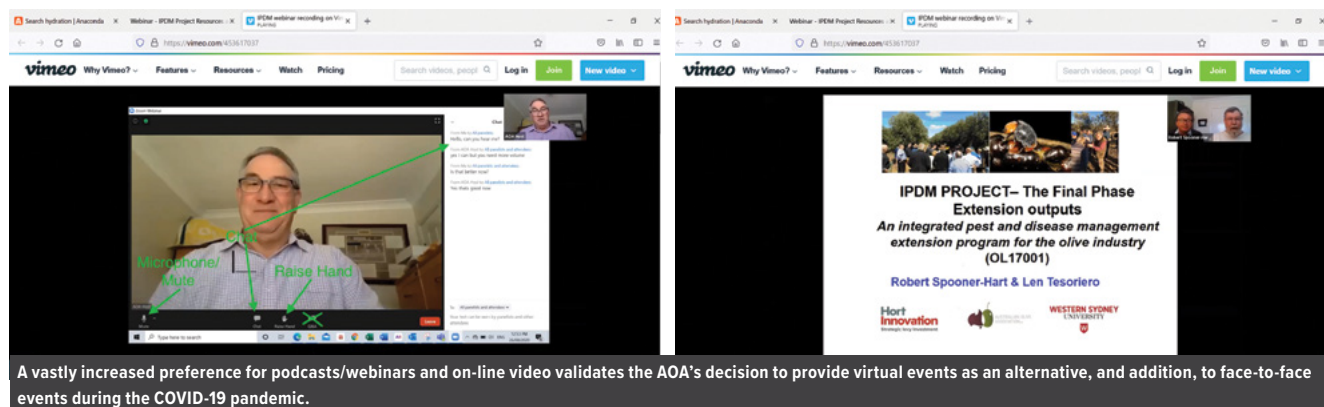
### Optimal water use efficiency

The data from sensors, imagery, tree measurements, and final yields and quality will be brought together to determine the best integration of technologies and models for supporting optimal water use efficiency by Australian olive growers.

The outcomes will inform management decision to optimise the water/productivity trade-off in periods of water scarcity, considering both spatial variability and dynamic time-dependent water demand (due to weather conditions).

This is a comprehensive study that offers much to the industry.

**This project is supported by Horticulture Innovation, through funding from the Australian Government Department of Agriculture, Water and the Environment as part of its Rural R&D for Profit program, along with the continued support of project collaborators including the Australian Olive Association, NSW Department of Primary Industries, CERES, and participating growers.**



## Survey shows support for pandemic move to webinars

**For the past three years the Australian Olive Association (AOA) has operated a communications and extension program for the benefit of our industry. A strategic levy investment project in the Hort Innovation Olive Fund, the *Australian olive industry communications and extension program (OL18000)* disseminates and promotes world-best practice and the results of R&D in grove management and olive oil/table olive production to the Australian olive industry.**

The project produces a wide range of resources and learning opportunities for industry members, including:

- events – best practice workshops and field days
- webinars and podcasts
- monthly Grove Innovation - R&D e-newsletter
- quarterly R&D Insights lift-out – project information and outcomes
- YouTube video content for the olive industry
- R&D updates on the OliveBiz website – projects and events
- Other resources as required.

With the current project deliverables substantially completed well ahead of the project finish date, in June the AOA conducted a stakeholder survey to measure the impact of the program and ensure each of the resources is delivering maximum benefits for producers. The feedback has also enabled the association to identify opportunities to further improve communications and target ongoing activities.

The survey covered various aspects of the communications and extension program, including outcomes for participants, for comparison with the responses to the July 2019 'base-line' communications survey.

AOA OliveCare® Administrator Peter McFarlane prepared the following report on the 2021 Olive Industry Communications Survey outcomes.

### Participant profile

For the June 2021 survey there were 133 participants, with 127 identified as from Australia, compared to the July 2019 survey where there were 140 survey participants with 129 identified as from Australia. State of origin was broadly consistent with AOA membership distribution, confirming survey data relevance and integrity.

In the 2021 survey, 73% of participants were olive producers and/or olive processors, compared to 86% in the baseline survey.

The 2021 survey had a slightly older age profile than the 2019 survey, with 58% of survey participants having been in the olive industry for more than 15 years and 40% less than 15 years. In the 2019 survey only 48% of participants had been in the industry for more than 15 years and 50% less than 15 years.

This data confirms the need to continue to provide introductory level information and training in an otherwise mature industry.

### Communication mode preferences

The preferred modes of communication were similar for the

2019 and 2021 surveys, with the most useful modes being:

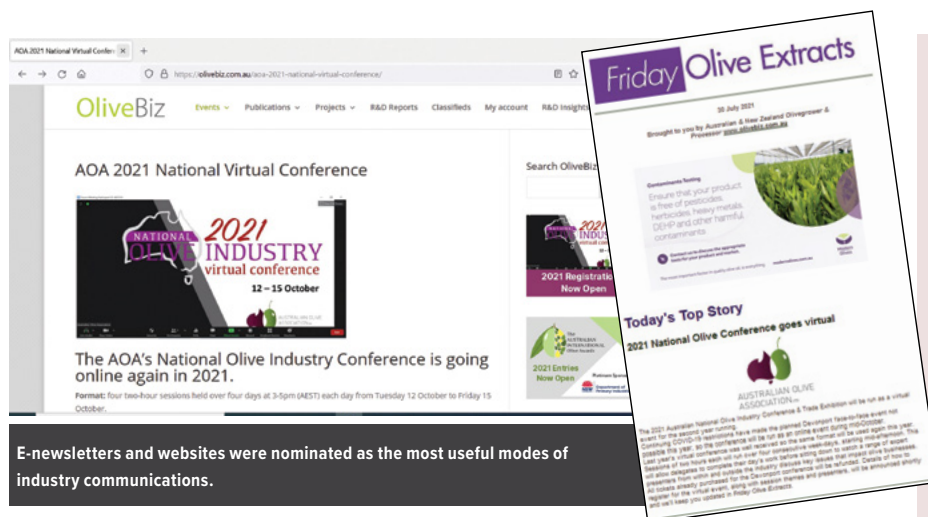
- websites (91%)
- emails and e-newsletters (90%)
- one-to-one face-to-face discussions (84%)
- field days/workshops/seminars (83%)
- on-line videos (81%)
- word of mouth - other growers (81%)
- word of mouth - service providers (81%)
- magazines (74%)
- podcasts/webinars (66%)
- hard copy reports (64%)

The modes of communication deemed less useful were:

- brochures/fliers (50%)
- social media (39%)
- text messages (35%)
- CDs or USBs with reports (30%)
- newspapers (30%)

The major changes were an increased preference for podcasts/webinars, from 45% in 2019 to 66% in 2021; and for on-line video, which increased from 60% in 2019 to 81% in 2021.

This likely reflects the increased use of webinars and on-line videos during the current COVID-19 pandemic period, validating the AOA's decision to provide webinars as an alternative, and addition, to face-to-face events.



### Specific communication channels

Looking at specific industry communication channels, survey participants rated the following highly:

- *AOA Update* - quarterly email (80%) – surprising given this is quarterly, possibly confusing this as meaning all AOA communications?
- *Friday Olive Extracts* - weekly email (80%)
- AOA industry notices - ad hoc email (79%)
- *Significant pests & diseases of the olive tree* - web page (77%)
- industry field days and workshops – physical events (72%)
- *Grove Innovation* - monthly email (67%)
- *Biosecurity Risk Management* - webpage (67%)
- *Australian & New Zealand Olivegrower & Processor industry print journal* - quarterly subscription (66%)
- AOA product labelling guides (65%) - available on website to members
- Chemical permit updates (61%)
- *OliveCare® News* – monthly email (60%) - available to Code Signatories and technical service providers
- industry webinars and podcasts (59%)
- industry virtual conference 2020 (59%)
- *R&D Insights* – quarterly, in *Olivegrower & Processor* and online on *OliveBiz* (58%)

- reviewed RIRDC resources – available online on OliveBiz (58%)
- market surveys and product compliance (58%)
- industry grove management online videos (56%)
- industry statistical updates - annual (54%)
- *Olive Growing Manual* – industry reference book (50%)

This data confirms the value of the AOA's multi-channel approach to industry communications and information transfer.

### Improvements to communications

“On the question of what improvements can be made to AOA communications, participant responses ranged from ‘very happy’ with current communication channels to those who were looking for more condensed information and simpler website navigation,” McFarlane said.

“No-one said there was insufficient information. Some thought there was too much, and clearly the challenge for participants is finding the time to look at all the information, or perhaps being able to prioritise the time to do so.

“The AOA is very appreciative of the level of response to the survey, particularly in this busy prolific harvest year, and will review and implement the survey findings. Our thanks to all who participated and shared their views.”



### Research recap

**PROJECT NAME:** Australian olive industry communications and extension program (OL18000)

**PROJECT AIM:** To promote world-best practice and the results of R&D in grove management and olive oil production to the Australian olive industry.

**PROJECT PARTNER:** Australian Olive Association

**PROJECT DURATION:** Three years - October 2018 to September 2021

### 2021 Olive Industry Grove Productivity and Marketing Survey

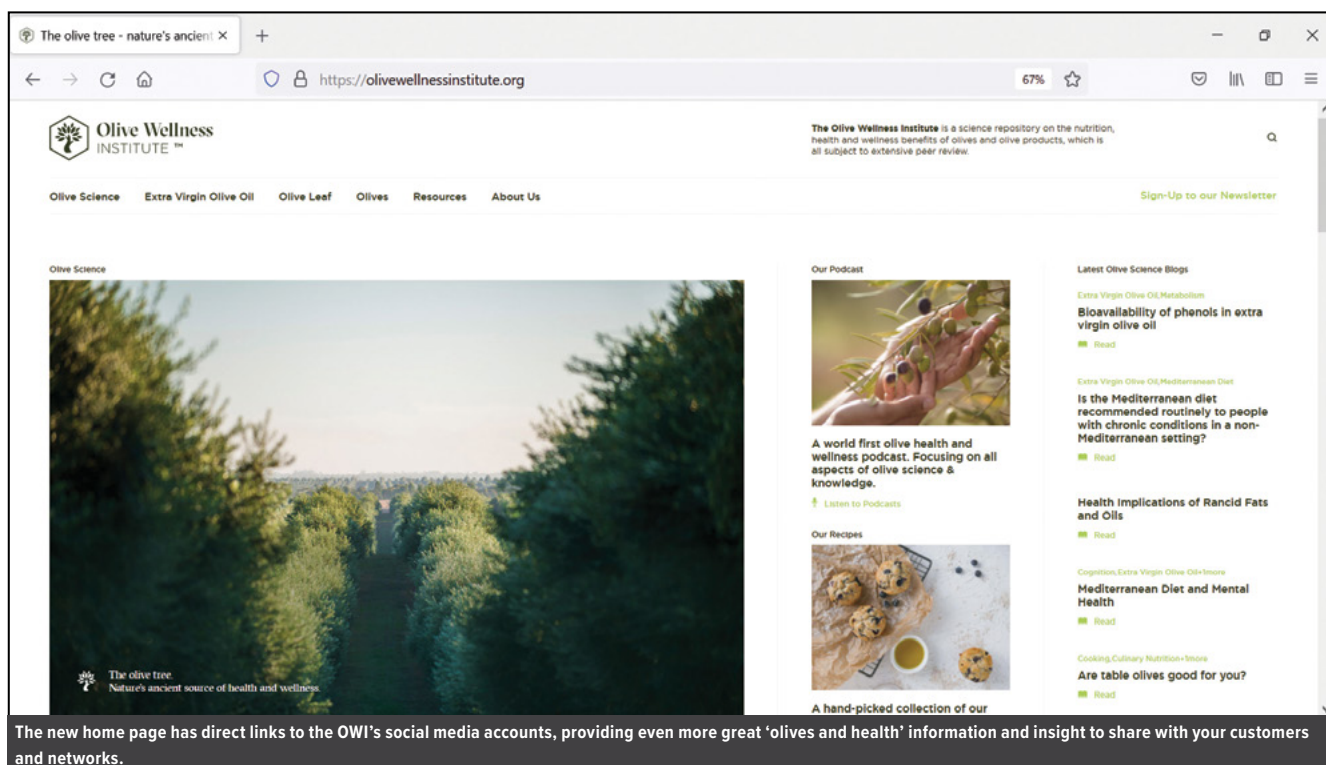
The AOA also operates an industry grove productivity program and a second survey was conducted in July to measure the impact of the program and to identify opportunities for improve and extension.

The survey included questions on grove productivity, the impact of COVID-19 on markets and marketing, weed control options, and table olive varieties and production. We'll report on the outcomes of the second survey in the December edition of *R&D Insights*.

This project was funded by Hort Innovation using the olive research and development levy, with co-investment from the Australian Olive Association and contributions from the Australian Government.







## New look, easier access for OWI website

The Olive Wellness Institute (OWI) team has been even busier of late, producing not only its usual stream of new information offerings but also a new website to house it all.

Launched in August, OWI Health and Nutrition Education Manager Abby Dolphin said the new website was created to provide more simple and direct navigation around the site and its content.

"The Olive Wellness Institute website has been providing evidence-based scientific health information for close to four years now. It's done a great job but it was time for an update," she said.

"In particular, we know we have so much science-based and interesting information to share on the health benefits of olive products and



we wanted to make it more easily accessible to our users. We realised that there's now so much content on the site that some of it was getting a bit hard to find.

"And of course we'll keep adding to it into the future, so it was time to get it sorted now."

### Modern and streamlined

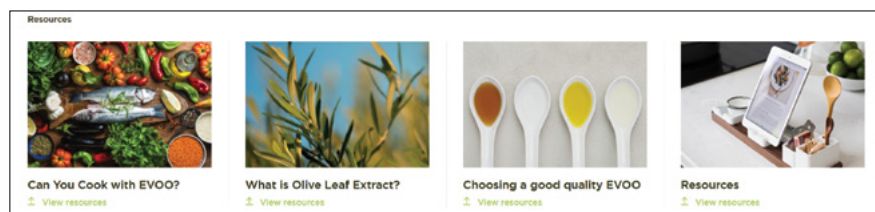
The new OWI website has a more modern look and feel, with new imagery and quick home-page access to the latest blog posts, research papers and other popular resources.

The cache of easy-to-follow recipes - all featuring EVOO, of course - and the OWI's health and wellness podcast series, are also now just a simple click away.

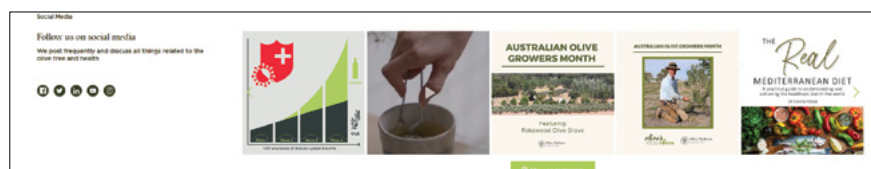
"Our website needed a new look and feel to keep our users engaged, and to help them find the information they're after quickly and efficiently," Abby said.

"We know growers and producers are busy people, and also that they're keen to use and share the resources on our site, so we hope the user journey on the website is now a lot more friendly and easy to navigate."

The Olive Wellness Institute is part of the strategic levy investment project Educating Health Professionals about Australian Olive Products OL19001. The project is partially funded by Hort Innovation, using the Olive Fund 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.



It also highlights some of the website's most useful and popular resources, including the myth-breaking 'Can you cook with EVOO?'





## Final series of AOA Technical Webinars now underway

**The AOA's ongoing program of productivity and profitability webinars has been a huge success, providing industry members with information, learning and discussion about a wide range of timely and relevant topics.**

A final series of technical webinars for 2021 is currently underway, with two held already and a further two over the next month:

**Table olive cultivars** - 28 September, 12.30-1.30pm AEST

A presentation and discussion with WA olive specialist Professor Stan Kailis around broadening the selection of Australian table olive cultivars, including the outcomes of the AOA 2021 survey results on table olive varieties grown in Australia.

The session will cover a range of considerations around table olive cultivars, including:

- what makes a good table olive cultivar?
- styles of table olives suitable for the Australian market
- major table olive processing cultivars - international
- major table olive cultivars - Australia (AOA 2021 table olive survey outcomes)
- opportunities for Australian table olive producers.

**EVOO storage considerations** - 5 October, 12.30-1.30pm AEST

A discussion with NSW DPI olive oil

specialist Jamie Ayton around the effects of storage containers on olive oil quality.

The session will cover the critical control factors for the storage of olive oil after processing, including:

- the major risk factors for olive oil quality under storage:
  - » heat
  - » light
  - » oxygen
  - » time
- changes in oil chemistry and sensory parameters under various storage conditions:
  - » peroxide value (PV), UV absorbance at 268nm (K268) and free fatty acids (FFA)
  - » Pyropheophytin a (PPP), 1,2-diacylglycerols (DAGs) and Induction Time (IND)
  - » polyphenols, α-tocopherol, chlorophyll, fatty acid composition (FAP)
  - » sensory attributes
- The effect of different types of storage containers on the quality of olive oil during storage, including:
  - » polyethylene, nylon,

- » metallised polyester, silver foil, HDPE
- » multi-layered products containing more than one type of material.

### Details

As with previous webinars in the AOA program, attendance is free to all industry members. Separate registration is needed for each session, with an access link provided via email post-registration.

The format for each event is a one-hour Zoom meeting, comprising a 30-minute presentation followed by a 30-minute interactive Q&A session. A virtual one-on-one with leading experts on the subject topic, the session provides plenty of opportunity clarify information or query particular issues.

Find out more and register at the OliveBiz website - [www.olivebiz.com.au/2021-technical-webinars](http://www.olivebiz.com.au/2021-technical-webinars).

These webinars are part of the Olive levy project Australian olive industry communications and extension program (OL18000), funded by Hort Innovation, using the Hort Innovation olive research and development levy, co-investment from the Australian Olive Association and contributions from the Australian Government.



## 'Business as usual' for OliveCare® as McFarlane retires

**After 11 fruitful years at the helm of the program, OliveCare® Code of Best Practice Administrator Peter McFarlane will be retiring at the end of September.**

AOA CEO Michael Southan will immediately take over the role, meaning it will be 'business as usual' for all program activities.

"In the interim, please feel free to contact me if you have any outstanding issues to be addressed, including issuing of 2021 season OliveCare® certification compliance

certificates," McFarlane said.

McFarlane has also been involved in a number of other Olive Levy-funded projects and programs, including as AOA Agri-chemical Permits Co-ordinator and *Tastebook*® Program Co-ordinator, and since 2017 has served as the AOA's Biosecurity Representative to Plant Health Australia. We'll look further at Peter's work with the industry in the December edition of *Olivegrower & Processor*.

### **OliveCare® enquiries from 1 October 2021**

For all OliveCare® enquiries please contact Michael Southan, AOA CEO and OliveCare® Code of Best Practice Administrator:

Mob: 0476 760 160

Email: [olivecare@australianolives.com.au](mailto:olivecare@australianolives.com.au) or [ceo@australianolives.com.au](mailto:ceo@australianolives.com.au)

## OliveCare® Best Practice webinar recordings now available

**Presented by OliveCare® Code of Best Practice Administrator Peter McFarlane, the Best Practice webinar series guides participants through a selection of OliveCare® Best Practice 'conversations' that aim to lift grove productivity, achieve product excellence and develop sustainable businesses.**

Recordings of the webinars are now available for viewing on the OliveBiz website:

### **Webinar 1: Grove Management Best Practice**

- Introduction to the OliveCare® Best Practice Program
- OliveCare® HACCP Style Food Quality Plans - An Introduction
- OliveCare® HACCP Style Food Quality Plans - On-farm best practice checklists

### **Webinar 2: EVOO & Flavoured Olive Oil Production Best Practice**

- AOA product labelling guidelines and Australian Consumer Law
- The Australian Standard (AS5264-2011) and OliveCare® product certification - EVOO and flavoured olive oil
- OliveCare® EVOO Freshness Testing and potential shelf life
- OliveCare® Food Quality Plans: The major risks to product quality - EVOO and flavoured olive oil production best practice checklists

### **Webinar 3: Table Olives/Olive Paste Production Best Practice**

- Food safety regulations and table olive production in Australia
- Voluntary Standard for table olives in Australia (12-111) and OliveCare® product certification - table olives and olive paste
- OliveCare® Food Quality Plans: The major risks to product quality - table olive production best practice checklists

Access the webinar recordings, and powerpoint presentations for each session, at [www.olivebiz.com](http://www.olivebiz.com) under *Projects - Webinars*.

This webinar series is part of the Olive levy project Extending OliveCare® to foster excellence in production of Australian olives (OL17006), funded by Hort Innovation, using the Hort Innovation olive research and development levy, co-investment from the Australian Olive Association and contributions from the Australian Government.