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THE AUSTRALIAN AGRONOMIST MAGAZINE

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Pioneering the Future of Agriculture in Australia and New Zealand p35

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THE AUSTRALIAN AGRONOMIST

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WHEN TO MIX AND WHEN TO ROTATE

The 'mix-and-rotate' WeedSmart Big 6 tactic aims to increase diversity within a herbicide program to delay and manage herbicide resistance. While rotating modes of action is relatively simple, mixing is much more complicated.

With this in mind, Dr Chris Preston and the weeds research team at The University of Adelaide and SARDI conducted a 3-year trial at two sites in South Australia and Western Australia to investigate the complexities of the 'mix-and-rotate' weed control tactic for managing annual ryegrass with known resistance to Group 15 [K/J] and Group 13 [Q] herbicides.

Herbicide resistance in weeds like annual ryegrass has two phases. First, frequent application of a particular mode of action selects for the survival of those individuals with resistance mechanisms. Second, these individuals set seed, and the proportion of resistant individuals increases in the weed population until the herbicide is rendered ineffective.

How much you can delay the onset of herbicide resistance through seed set reduction is debatable and varies between weed species. It depends on many things, such as how much weed seed enters the seed bank each year, what proportion of that seed is susceptible to the subsequent herbicide mode of action, whether the seed is short-lived or persistent in the seed bank, or if the seed has variable dormancy traits.

"Herbicide rotation is a proven tactic that delays the onset of herbicide resistance because you use each mode of action less frequently," says Chris. "This tactic relies on having a diverse crop rotation in place that allows the grower to use the widest array of chemistry throughout the rotation to keep weed numbers low and minimise the risk of resistant individuals surviving and setting seed."

As a resistance management strategy, herbicide mixing is far more complex than rotating modes of action. The effectiveness of this strategy can vary markedly and requires considerable thought before a mix can be recommended.

To begin with, it is essential to know the herbicide resistance profile of the weeds present in the paddock. For a herbicide mixture to be an effective herbicide resistance management tactic, it is necessary that:

Both components have high activity on the target weed population (sometimes referred to as 'redundant killing').

Both components have similar persistence in the environment.

The frequency of the resistance allele needs to be low for both components of the mixture.

If the tank mix is designed solely to control a spectrum of weed species, it will not assist with herbicide resistance management for those different weeds.

For a pre-emergent herbicide mix to provide long-term efficacy, the products in the mixture need to be activated simultaneously and provide a similar length of control of ryegrass. If one is more soluble than the other, or if one breaks down faster, there will be times when just one of the herbicides is active and applying selection pressure, potentially leading to faster evolution of resistance.

Populations of annual ryegrass commonly have a much higher percentage of individuals with mechanisms (mutations) for resistance to some herbicides (e.g. Group 2 [B]) than others (e.g. Group 9 [M]). This is one reason why resistance seems to occur at different rates in the field, even if the two herbicides are applied at similar frequencies.

If the population's resistance allele frequency to one component of the mixture is high, this can increase the chance of selecting individuals with resistance to both modes of action in the mix. This is why mixes that include a Group 2 herbicide often rapidly fail due to resistance.

With outcrossing species like annual ryegrass, using an inappropriate herbicide mix can result in a more rapid evolution of resistance than if the components were simply rotated within a diverse cropping rotation.

When a weed population has known resistance to some herbicides, it is important to design a strategy around maintaining low weed numbers and limiting seed set.

"In the trial at Roseworthy, we planted two populations of annual ryegrass, both with resistance to Group 15 herbicide, into an existing annual ryegrass population,"

To begin with, it is essential to know the herbicide resistance profile of the weeds present in the paddock.

Dr Chris Preston

Dr Chris Preston and the weeds research team at The University of Adelaide and SARDI conducted a 3-year trial at two sites in South Australia and Western Australia to investigate the complexities of the 'mix-and-rotate' weed control tactic for managing herbicide resistance.

1. Nil herbicide.

3. Mix Group 15 mix / Group 13)

4. Rotate Group 15 mix

Not using any herbicide (treatment 1) resulted in the highest ryegrass density, most weed seed heads, and grain yield was about 50 per cent less than in the best herbicide treatment (treatments 4 & 5). Repeated application of a herbicide mix (treatment 3) resulted in less grain yield and more weeds within three years.

says Chris. "We implemented a wheat, faba bean, wheat rotation for the three years of the trial and applied five different herbicide strategies. There was background resistance to trifluralin in the weeds already present in the trial area, so trifluralin was not used in the herbicide treatments."

The aim was to test the efficacy of the mix-and-rotate strategy as a resistance management tool. The five treatments were:

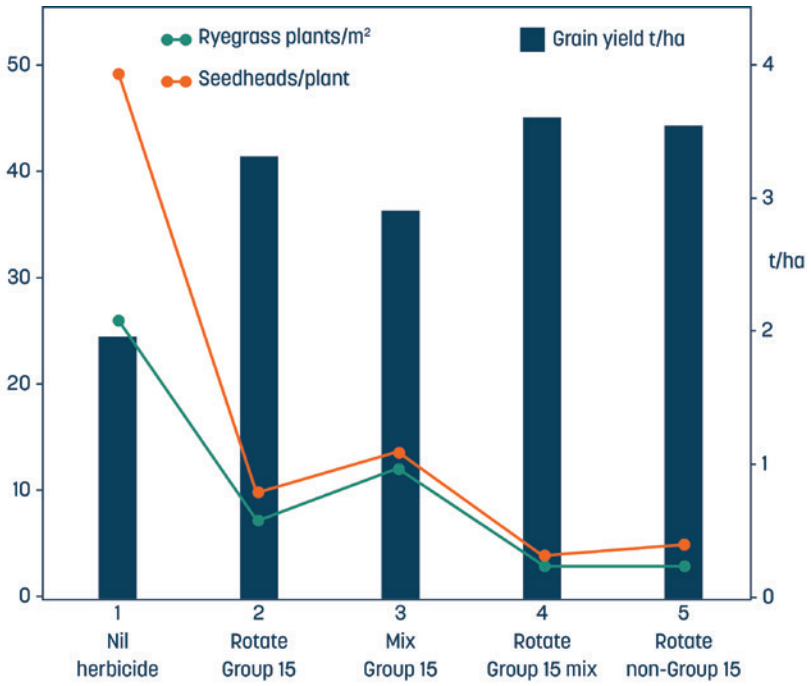
1. **Nil herbicide applied**
2. **Rotation of two different Group 15 herbicides – one in wheat and the other in faba beans**
3. **The same mix of Group 15 herbicides applied each year**
4. **A different mix of Group 15 herbicides applied each year**
5. **Rotation of herbicides that did not belong to Group 15**

In this trial, crop emergence was the same across all treatments, and there were significant differences in weed density, weed seed head production and crop grain yield between treatments.

Importantly, not using any herbicide (treatment 1) resulted in more weeds and less crop yield. The nil herbicide treatment resulted in the highest ryegrass density, most weed seed heads, and grain yield was about 50 per cent less than in the best herbicide treatment.

"Rotating the Group 15 herbicides (treatment 2) provided reasonable control and supported crop yield," says Chris. "But applying the same Group 15 mixture (treatment 3) failed within the three years with higher weed seed head numbers and lower grain yield."

"Rotating the mix of Group 15 herbicides (treatment 4) and rotating single herbicides from non-Group 15 modes of action (treatment 5) produced similar results and were the cleanest and highest-yielding treatments."



The researchers also tested the mix-and-rotate strategy to manage a population of annual ryegrass resistant to both Group 15 and Group 13 herbicides. Three treatments were applied to this population:

1. **Nil herbicide.**
2. **Mix and rotate (Group 13 / Group 15 mix / Group 13)**
3. **Mix applied annually (Group 13 + Group 15)**

Again, applying no herbicide was disastrous for weed seed production, and grain yield was 50 per cent less than the herbicide treatments. Rotating Group 13 with a mix of Group 15 herbicides and applying the same mix annually were not significantly different in weed seed production or grain yield.

These trials illustrate that there is unlikely to be a perfect herbicide strategy. Appropriate mixing and rotating can be valuable strategies, and there is a place for rotating mixtures, but they can't be relied on completely. This is why it is essential to stack as many other tactics as possible to build a robust and integrated program of herbicide and non-herbicide tactics to control weeds. This means employing crop competition and weed seed reduction practices wherever possible, in addition to herbicide use. It is also crucial to test for susceptibility to herbicides that you plan to use.

For more information about integrated weed management, visit the WeedSmart website: www.weedsmart.org.au

Attribution: Cindy Benjamin, WeedSmart

BUDDING AGRONOMISTS THRIVE IN ELDERS GRADUATE PROGRAM

THIS YEAR'S ELDERS GRADUATE AGRONOMISTS GATHERED IN TAMWORTH LAST MONTH, MEETING WITH KEY SUPPLIERS AND REFLECTING ON THEIR FIRST SIX MONTHS IN THE PROGRAM.

Elders' Graduate Agronomy Program is renowned for producing some of Australia's best agronomists. A two-year, entry level program, participants are exposed to both horticulture and broadacre areas to expand knowledge of each, as well as gaining a broad understanding of Elders and the agricultural industry.

Liam Bastian, Graduate Agronomist based at Roseworthy, South Australia, highlighted the benefits of the program.

"The rotations allow us to travel across Australia, to work in diverse areas and with new clients on various crops beyond that in our local region," he said.

"Gathering as a cohort during events like this study tour, allows us to collectively share our knowledge and experiences with our peers.

"These study tours provide us with insights into new products being developed and trial work by key suppliers, preparing us to make informed recommendations to clients once these products hit the market."

Graduates are based in key cropping regions across Australia and are supported by seasoned staff to gain experience and exposure.

Grace McDonald, Graduate Agronomist based at Elders Miles, Queensland, values the support and mentorship she has received.

"Since stepping into the role, I have been blown away by the level of support I have received, particularly the phenomenal mentorship of senior agronomist Neal Stevenson," she said.

"It's critical as a young agronomist that we feel supported to apply and develop our skills.

"It is my professional support network who have given me the space and confidence to undertake my own trial work, which is something I am really proud and excited about."

A defining factor of Elders' Graduate Agronomy Program is its differing rotations, providing graduates like Grace an opportunity to build knowledge of different crop segments and regional areas. Grace already has her second rotation planned and is set for a smooth transition in the coming months.

"There is a lot of thought that goes into planning our rotations, from a national point of view, to ensure we go into a new area that we are interested in learning about and growing in," she said.

"I think a big point of distinction is the support we are provided during each move as we progress through the program."

Elders 2024 graduate agronomy cohort with Adam Little, Elders Technical Services Manager.

COLLABORATION KEY TO ULTIMATE GENOTYPES IN PLANTS AND LIVESTOCK

University of Queensland researchers are setting the agenda for breeding high yield, heat tolerant and disease-resistant crops and low emission cattle with excellent feed conversion efficiency as they search for the ultimate genotype.

Professor Ben Hayes from UQ's Queensland Alliance for Agriculture and Food Innovation (QAAFI) said the ultimate genotype can improve the performance of the best individuals in a species population up to 6 times, and has been demonstrated in dairy cattle, wheat and chickpea.

"With millions of cattle and plants now genome profiled, we can imagine what ultimate genotypes look like – with the best chunks of genome from across a population stacked into one 'ultimate individual'," Professor Hayes said.

"We believe rapid advances in gene editing and synthetic biology are potential pathways to get to that target as quickly as possible."

Professor Hayes said there were limitations to trying to achieve the ultimate genotype using conventional methods.

"Even with speed breeding in crops and IVF in cattle, our digital twin simulations show us that breeding the ultimate genotype will take many generations," he said.

"The welfare and fitness of animals is paramount if you're doing this in livestock, as improvements in a single trait can have detrimental consequences in other traits.

"The climate is also changing so rapidly that the target is constantly moving, and at the same time consumer preferences are changing.

"That's where gene editing and synthetic biology come in - these technologies could help us obtain ultimate genotypes in just a few generations."

QAAFI plant geneticist Professor Ian Godwin said the potential is enormous.

"If successful, this technology is going to change plant and animal breeding," Professor Godwin said.

"Excitingly, we're already editing one or two genes and speeding up our ability to create new genetic combinations.

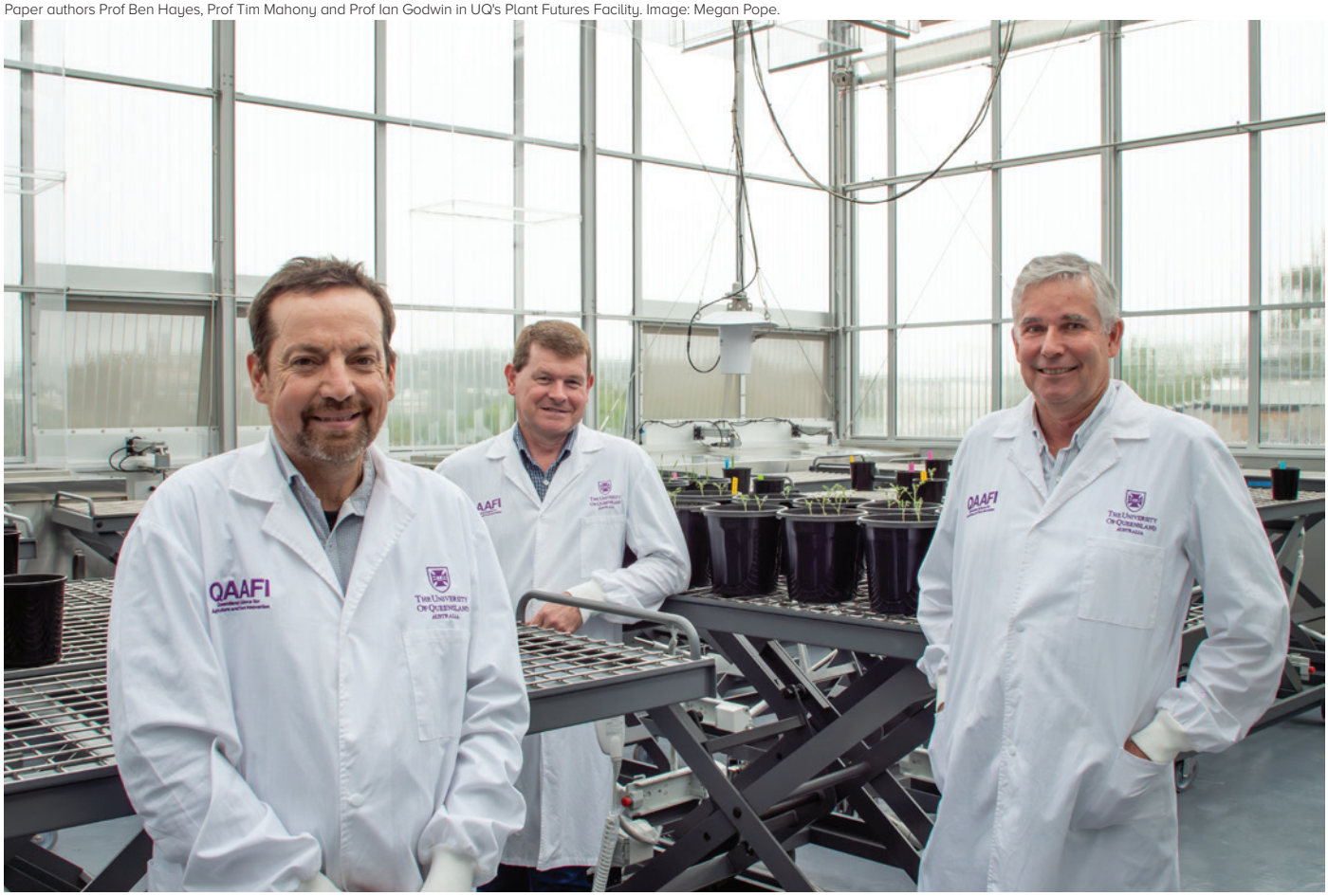
"Our simulations tell us the level of genetic advances is going to be higher if we can edit large numbers of genes simultaneously."

Professor Godwin said international collaboration was vital for the approach to succeed, with efforts already underway via the International Research Training Group and the UQ-led ARC Training Centre in Predictive Breeding.

"We're calling for other groups involved in genetics worldwide to come forward and collaborate with us.

"We're looking to test these theories on a broad scale and on a number of species, and eventually get them from glass houses and laboratories out into the field."

Paper authors Prof Ben Hayes, Prof Tim Mahony and Prof Ian Godwin in UQ's Plant Futures Facility. Image: Megan Pope.



INCREASING PLANT TOLERANCE TO CURRENT ADVERSE CONDITIONS

With rainfall deficiencies and water shortages at the end of October showing many water storage levels in south-eastern states 10 -50%[1] lower than this time last year, and many Western Australian growing regions seriously impacted by flooding and water-logging, there's a timely addition to farmers' toolkit to increase plant tolerance to these adverse conditions.

Used for its supportive role in plant growth and vigour for many years, Seasol seaweed extract has proved effective for improving plant growth, stress tolerance, yield and produce quality in a wide variety of soils and commercial crops including sugarcane, fodder and pastures, tree crops and horticultural crops.

With added potassium, Seasol Plus Potassium is specially formulated to stimulate and protect crops and pastures from stress. A less-stressed plant is able to use the extra potassium for recovery and growth.

Protecting vulnerable plants at germination, transplanting and post-harvest, Seasol Plus Potassium also improves plant response to stressful climatic and environmental conditions, including excessive moisture and water logging, frost, hail, wind, hot and dry weather, salinity and pathogen and insect attack.

Seasol - a proven bio-stimulant

Used by farmers, orchardists and commercial growers via foliar and fertigation for more than 40 years to improve the quality and yield of commercial crops, Seasol was developed in Australia and is manufactured here in Tasmania.

Seasol Hort and Ag Division general manager John Hocking said many years' results from the field consistently show that Seasol improves the quality and yield of crops and pastures, reduces plant stress, and produces tougher, healthier plants.

"Because it strengthens and creates stronger cell walls, Seasol increases tolerance to environmental stresses such as drought, heat and frost.

"It effectively improves cold-stress tolerance within 5 days of foliar application at 10L/ha, with the effect lasting up to 2-3 weeks. It also aids recovery and stimulates healthy growth after frosting.

Seasol-treated plants also cope better with the heat when sprayed ahead of hot weather, with additional sprays aiding recovery."

Post-harvest and post-grazing, Seasol supports healthy leaf growth for energy and nutrient storage for the next crop, and root-growth flush after harvest in vine and tree crops. Stimulating plant and root growth and activity, Seasol products also have an important role to play in improving carbon capture and soil improvement.

How Seasol Plus Potassium can help

Proven by science and confirmed in the paddock, Seasol Plus Potassium has been shown to increase plant tolerance to adverse environmental conditions.

Mr Hocking said with its boost of extra potassium, Seasol Plus Potassium provided growers with important 'crop insurance' across a wide variety of crops and pastures.

"Potassium plays key roles in plant cell-wall stability, helping the plant to resist lodging, plus aid moisture uptake and movement in the plant.

“potassium also acts as the plant's 'antifreeze', improving frost tolerance and helping plants survive sudden frost stress. The added potassium in Seasol Plus Potassium also assists plants in hot and dry conditions, enabling them to retain potassium levels and the important role it plays."

He said that to encourage strong growth and nutrient uptake, and to reduce or prevent plant shock, Seasol Plus Potassium was recommended for supporting the plant during germination, transplanting, critical growth stages, and to support high crop loads and post-harvest.

He noted that in flooded and waterlogged soils, nutrients will have been leached, leaving plants unable to access vital soil nutrition.

Application of Seasol Plus Potassium

Seasol Plus Potassium (Available in 20,200 and 1000-litre commercial containers) can be used either as foiler application via boom sprays, air-blast sprays, drop systems, travelling irrigators, central pivot or aerial spraying, or via direct application to the soil.

Tasmanian small beginnings, now international

Seasol began as a small Tasmanian-based company making a plant-health tonic and soil conditioner from kelp for local farmers, growers and home gardeners, with products now sold around the world.

With significant R&D resources, the commercial arm of the Seasol business now works with some of the biggest farms, turf growers, parks & gardens and horticultural growers in Australia to increase yields and performance. Products are also Certified Organic in Australia, New Zealand and Europe.

Growers across Australia have found these kelp-based products have a profound impact on soil and plant health - and in turn yield and quality - across all forms of farming, with the company providing technical support and expertise.

In response to market demand and need, the commercial range continues to expand with new products, including Seasol Plus Potassium.

A long-term Australian player, with trial data from many crops and soil types, Seasol plans continued extensive R&D in large scale commercial fruit and veg crops, and in broad acre farming of coral and legumes.

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1. Meteorology, Australian Government - Bureau of Meteorology. “Drought Statement.” Australian Government - Bureau of Meteorology, November 7, 2024. Australia. http://www.bom.gov.au/climate/drought/.

QUALITY AND TASTE ARE THE KEYS TO SWEET BERRIES AT SILVAN

STRAWBERRIES OF HIGH QUALITY THAT TASTE GREAT ARE THE GOAL FOR MICK MOLLUSO ON HIS PROPERTY AT SILVAN, IN THE YARRA VALLEY OF VICTORIA.

This is achieved through a combination of variety selection, good agronomics, and a range of chemistry to produce strawberries that are in demand by Australian consumers.

The Molluso family established the enterprise in 1995 and since then have seen a wide range of changes in the way they farm and grow their produce.

There are three or four varieties that are suited to the climate in Victoria and enable them to plant at different times of the year and harvest for many months.

Mr Molluso said their summer planting is in January and February followed by the winter plant in May and June with harvest usually occurring from mid-October through until mid-May.

Protective fungicides are necessary in an area that can get between 750 and 950mm of rainfall each season with a crop that grows and produces across many months of the year.

"We try to rotate because you don't want to build up resistance," Mr Molluso said. "Even if the product is great, we do change from product to product and chemical groups to help our management."

He said the main disease challenges are Grey mould (Botrytis cinerea) and Powdery mildew (Sphaerotheca macularis) and they implemented a preventative program to minimise the chance of any damage.

Both diseases can cause major fruit damage and loss if left unchecked, so the program involves a wide range of fungicide options.

Mr Molluso said this season they introduced Verpixo® Adavelt active fungicide from Corteva Agriscience into the mix and were impressed with the results.

"We thought Verpixo would complement our spray program and it seems to have done a really good job controlling the disease. I've used it twice this year. When we can start seeing that we're going to come into some pressure - we've applied it before that period."

One of the applications occurred in April at a time when the weather was getting cooler and there was more rain.

"We are very heavily reliant on IPM, so we are trying to adapt to a system where we spray less and target sprays. That way we're minimising what chemicals we're putting onto the plant."

Verpixo was tested in Australian conditions before release and found to have low, to no, impact on a range of beneficial insects and pollinators.

This makes it an ideal option to include in an IPM program.

Mr Molluso said the strawberry industry had evolved over the almost twenty years they have been producing, with new techniques and products coming through.

He said one key change was to lift the strawberry production off the ground and into planters for easier picking to combat the difficulty they have had sourcing labour.

"We looked at other ways to attract labour to work for us and off the ground is also better in regard to the management of fungicides. You have more airflow so that is where we are heading in the future."

"We've made special-purpose sprayers for the strawberries grown off the ground and some high-pressure air-assisted units as well. They both work at different times of the season, and we'll adapt to whichever equipment is suitable for that period."

The targeted application of Verpixo was around weather events where they knew disease was likely and a decision was made to look at a superior product in that situation.

"You look at the amount of crop that you have on the plant and target it when it's going to be suitable," Mr Molluso said. "If you've got a high yield obviously you need to make sure that you're putting on your better products."

He said they learned about Verpixo from their local agents, and it provided a good option in their fungicide program.

Verpixo controls both key diseases of Grey mould and Powdery mildew and, as a Group 21 fungicide, provided a new mode of action to the strawberry industry.

It has a short one-day, pre-harvest interval which provides flexibility at a critical time of the season.

Mr Molluso said they had implemented an Integrated Pest Management (IPM) program across the enterprise for many years and one of the key considerations with new products was its ability to suit this system.

"We've got pest issues, and you have to find products that are going to be IPM-friendly as well," he said.

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FMC

USING MILITARY-GRADE SATELLITES IN THE WAR ON WEEDS

Getting a bird's-eye view of cropping paddocks gives growers and their advisors a wealth of information to assist decision-making. The recent proliferation of satellites and developments in sensor capability have thrown the door open to significant advances in precision weed management.

Tim Neale, digital agronomy specialist and DataFarming managing director, says the commercial availability of super-high-resolution imagery from the latest generation of military-grade satellites, plus algorithms to distinguish between crop and weed plants, can turn any modern sprayer into a spot sprayer without any up-front capital expense.

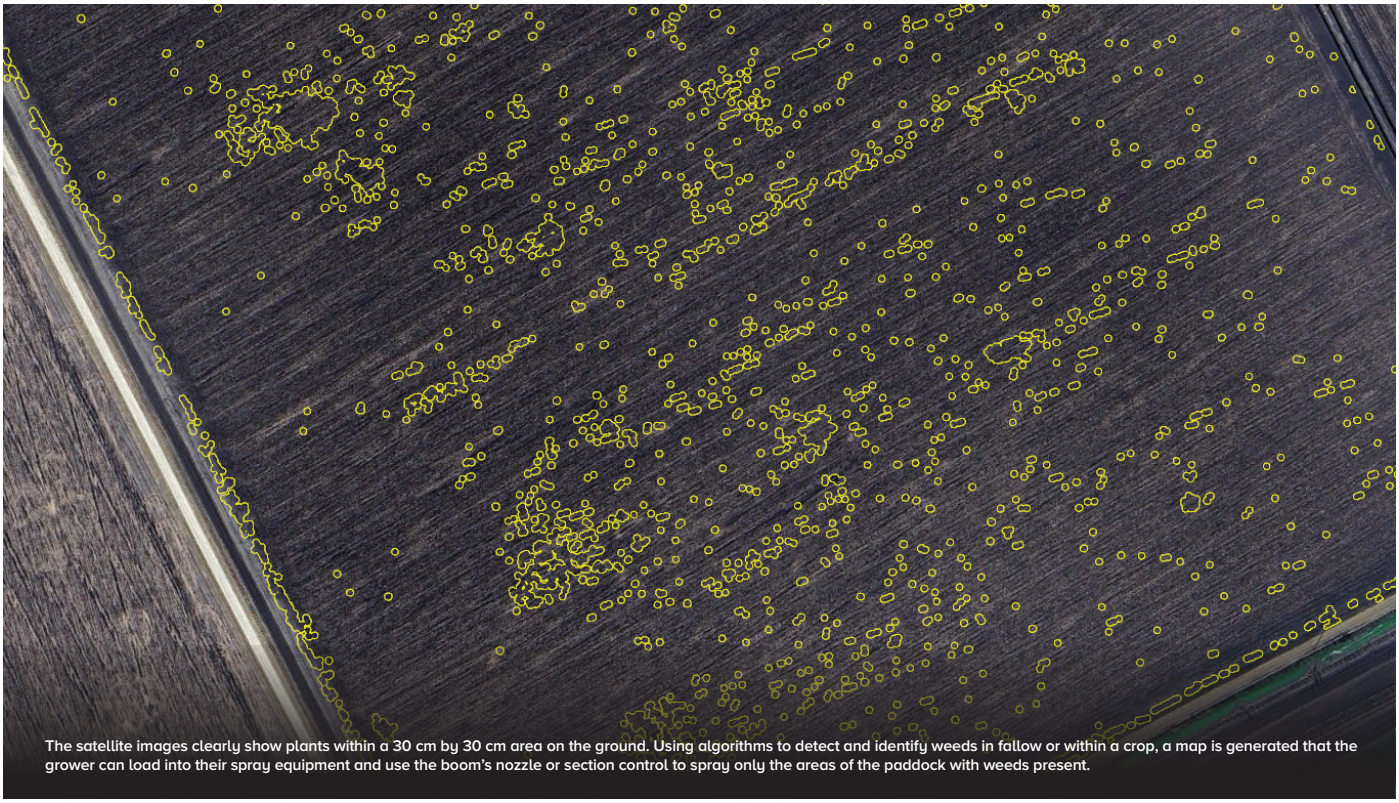
"The images we can currently access from these satellites clearly show plants within a 30 cm by 30 cm area on the ground," he says. "Using algorithms to detect and identify weeds in fallow or within a crop, we can generate a map that the grower can load into their spray equipment and use the boom's nozzle or section control to spray only the areas of the paddock with weeds present."

Tim is leading a new 4-year GRDC and SmartSat CRC funded project to harness the potential of remote sensing technologies to assist growers and agronomists. On the weeds front, the team is tackling one of the hardest problems first – detecting annual ryegrass in cereal crops. Other priorities are all fallow weeds, brassicas in winter crops, and hard-to-kill weeds like fleabane, feathertop Rhodes grass and barnyard grass in summer row crops.

"The visible spectrum for humans is three different bands of light – red, green and blue. But the latest generation satellites can see up to 350 bands of light," he says. "It is now possible to discriminate between different plant species to separate target weeds from the crop."

"We are collecting data for green-on-green detection of ryegrass in wheat this winter and hope to have algorithms ready to field test in 2025."

The system is well-advanced for remote green-on-brown weed detection in fallow, having been field-tested last summer. Tim says this service will likely be available on a limited, early-release basis to growers for the coming summer fallow season at less than $10 per hectare for green-on-brown spray coverage maps. Everything is done remotely, with the spray map file emailed to the grower ready to upload or pushed directly to the machine through connections with programs like the John Deere Operations Centre.



The satellite images clearly show plants within a 30 cm by 30 cm area on the ground. Using algorithms to detect and identify weeds in fallow or within a crop, a map is generated that the grower can load into their spray equipment and use the boom's nozzle or section control to spray only the areas of the paddock with weeds present.

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"To use the service, growers will just need to provide their paddock boundaries and have the ability to upload a shape file to their spray gear with nozzle and or section control capability," he says.

The spray map includes a buffer of a couple of metres around the detected weeds. Typically, herbicide is applied to around 15 to 20 per cent of the paddock, vastly reducing the volume of product used compared to blanket spraying. Decoupling the weed detection from the spraying also means that the operator knows how much product to put in the tank ahead of time.

"One of the major advantages of satellite weed detection is that growers do not need to invest in more machinery to increase their spot-spraying capability," says Tim. "There are no cameras or sensors to maintain on-farm and no need for an operator to collect the imagery."

With a rapidly increasing number of these high-grade satellites orbiting the Earth, imagery is available soon after capture, and in the near future, revisit times over the same location will be daily or even multiple times a day, reducing the potential impact of cloud coverage.

Tim says the available satellite images provide scalability with 5000 to 10,000 ha captured in a single pass, which reduces the cost per hectare to capture and generate the spray maps compared to using drones to collect the imagery.

The team has also demonstrated the algorithms' capability to distinguish between a row crop like sorghum and a hard-to-kill weed like barnyard grass. Using the map, the grower could use a shielded sprayer or inter-row cultivator to target the weeds within the cropping season.

The project will also investigate the opportunity to use satellite images to monitor for changes in weed populations over time and identify small incursions of emerging or herbicide-resistant weeds. Giving growers and their advisors early warning of changes will help with effective herbicide choices for the field while targeting small areas with suitable chemistry to avoid the resistant gene spreading.

Weed detection and mapping is a powerful tool for growers to use as they implement the WeedSmart Big 6 tactics to stop weeds setting seed, and minimising the risk of herbicide resistance.

"With growers and agronomists managing increasingly large production areas, it is very easy to miss early warning signs," says Tim. "There is also great scope to use this technology for monitoring and managing crop nutrition, pests and diseases."

For more information about remote sensing for weed control, visit the WeedSmart website: www.weedsmart.org.au
Attribution: Cindy Benjamin, WeedSmart

Prof Yasmina Sultanbawa and Oren Barak - Photography © Megan-Pope

A FRUITFUL PARTNERSHIP TO BOOST BUSHFOOD

A shared vision to boost Australia's Indigenous-led bushfood industry is the key to the partnership between The University of Queensland and Roogenic, which makes products with Australian plants that have nutritional and health properties.

The partnership incorporates research from the ARC Training Centre for Uniquely Australian Foods on the properties of leaves and fruits like Kakadu plum (Gubinge), Jilungin and wattleseed sourced primarily from Indigenous communities and small farms.

Centre Director Professor Yasmina Sultanbawa said the collaboration began more than 4 years ago, in Darwin.

"We met through one of our Indigenous communities and we just clicked immediately," Professor Sultanbawa said.

"We had so much to discuss about future research and how to build the bushfood industry working with Indigenous communities – I knew their heart was in the right place and their values were like ours.

"They bring us the industry perspective and share information about the market needs, what the consumer wants.

"When the Indigenous communities start growing for business, they need to scale up, so that is where we begin our research.

"The communities must scale up because more product is needed, so we need to support those communities to create a quality, safe product and then provide market access.

"We provide research on the quality and safety of bushfoods, how much can be consumed, and what it does to the body, confirming Indigenous knowledge dating back tens of thousands of years.

"What we have now is a trusted partnership and a three-way research collaboration between UQ, Roogenic and Indigenous partners."

Roogenic Marketing Director Jordan Bruno said the collaboration with the UQ team was amazing.

"We got along well, and straight away everything aligned with what we wanted to do, in terms of growing the bushfood industry and making it more equitable," Mr Jordan said.

"It's not an easy industry to work in – the supply chain is unique as a lot of these plants are wild harvested, don't fruit every year, with fruit and leaves often different sizes and prone to natural disaster like bushfire.

"So, to be able to forecast sales and get stock in and make products is a challenge, but also enormously rewarding.

"We have profit-sharing strategies in place and ensure community is part of the value chain.

"It's an incredible perspective to have access to such an amazing culture and to learn about it.

"As we've grown and seen the opportunity to invest in research, new products, support communities, Uniquely Australian Foods is always our first point of contact.

"It's been a whirlwind and the growth has been incredible to see.

"The world is slowly being educated about Australian plants and we take real pride in that."

Donations to this program can be made through the QAAFI First Nations Agribusiness Research Fund on UQ Giving Day, to fund research empowering Indigenous communities in agribusiness.

The Queensland Alliance for Agriculture and Food Innovation (QAAFI) is a research institute at The University of Queensland supported by the Queensland Department of Agriculture and Fisheries.

Wattleseed at UQ sensory lab - Photography © Megan-Pope

Native halophytes - Photography © Megan-Pope

Kakadu plum in the laboratory - Photography © Megan-Pope

NATURAL PYRETHRUM IS BACK.

IT NEVER REALLY WENT AWAY BUT NOW, AUSTRALIA IS THE WORLD'S BIGGEST PRODUCER AND SUPPLY IS RELIABLE. IT'S TIME TO BECOME RE-ACQUAINTED.

As an agronomist, much of the insecticidal segment of your life will have included the OPs and the synthetic pyrethroids. Natural pyrethrum existed but little was used on commercial crops.

For a manufacturer to claim pyrethrum is natural and therefore best doesn't cut it.

An insecticide is better judged on what pests it will kill, how quickly, withholding period, any effects on the workers applying it and value for money. Resistance is another factor to be considered.

So, how does a natural pyrethrum insecticidal concentrate stack up?

For a start, the label allows use against the widest range of pests; for plant pests the SITUATION box on the label says: "Fruit and vegetable crops, cut flowers and ornamental plants." And the pests?..."Aphids, ants, cabbage moths and other caterpillars, earwigs, leafhoppers, thrips, whiteflies". The pests in ALL buildings include: "Mosquitoes, flies, midges, ants, silverfish, moths, cockroaches, grain weevils, spiders, earwigs, beetles and other flying insects" and for Outdoors: "Adult mosquitoes, midges, flies and other flying insects'. Not many are missed.

They are impressive lists.

As an agronomist, you can tell your growers it will kill any insect they can contact with a droplet, it will die within minutes, re-entry as soon as the last droplet settles, humans cannot develop chronic poisoning, 1 day withholding and it is compatible with foliar fertilisers and fungicides.

It wears GROUP 3A INSECTICIDE on the label just like all the synthetic pyrethroids which were man-made, copying parts of the natural active. But because the natural active is of six isomers (Pyrethrins 1 and 2, Jasmolins 1 and 2 and Cinerins 1and 2), synergised by piperonyl butoxide which also reduces the pest's ability to metabolise any active... resistance is unknown.

Pyrethrum degrades in UV light. It can be applied around sundown (earlier on a cloudy afternoon) killing all insects hit. Just wait for the bees to go 'home'. Insects such as caterpillars, earwigs and others that hide in the bark, soil or mulch during the day and climb into the plant at sundown will be walking over or eating active that is still lethal. They too will die. Bees are very sensitive and repelled by Pyrethrum and will not venture into the crop until about morning tea-time next day.

If a plan was to protect a crop with beneficial insects but the pests swarmed into the crop earlier and became too numerous... an afternoon application will reduce their numbers and, as the residues quickly dissipate, you get a second chance to add beneficials when the pest population is just big enough to give them a mission.

Natural pyrethrum immediately stimulates insects into action. They run, fly, hop... losing all need for discretion. This means they bump into more droplets, run across more wet surfaces increasing the dose significantly. The next stage is spasm; think of a blowfly buzzing in a tight circle on a window sill. It then enters the paralysis stage where, if you could see the "expression on their faces" it would be like an unseeing stare, mouth agape and veins bulging with tension. Well you get the idea. Death comes a little later.

What happens to humans? Well, a few are allergic and sneeze and the skin prickles. Most of us are like the millions who use aerosol Mortein (and others) in our kitchens and other living areas without any effect on us. But, if you handle the concentrate when diluting prior to application, avoid touching sensitive skin areas (don't pick your nose or lick your finger to turn the page in your notebook, and don't pee) without first washing your hands.

Ion Staunton is the entomologist at Pestech.com.au manufacturers of Py-Bo Natural Pyrethrum Insecticidal Concentrate. Talk to a human on 1800 123 456 7. After hours leave a message and we'll call you back.

AUDIT REVEALS MAJOR GAPS IN GOVERNMENT'S MURRAY DARLING BASIN PLAN COMPLIANCE

An independent audit into the Federal Government's compliance with the Basin Plan 2012 and water resource plans has exposed significant shortcomings in its systems and processes, according to the National Farmers' Federation.

NFF Water Committee Chair Malcolm Holm said the audit into the Department of Climate Change, Energy, the Environment, and Water's (DCCEEW) confirmed concerns about the Government's ability to manage Basin resources effectively.

"The audit highlights major failings in consultation and delivery, putting at risk the transparency and accountability expected in the management of Australia's vital water resources.

"This department would struggle to run a Friday night meat tray raffle at the pub, yet it is in charge of a water buyback program worth billions. "Minister Tanya Plibersek committed to greater accountability for her department, yet we are seeing the opposite."

Mr Holm highlighted these results were in stark contrast to the performance of the Commonwealth Environmental Water Holder (CEWH), which was also reviewed as part of the audit.

"The CEWH's performance was rated 'largely effective' in all four areas. This highlights a clear disparity in the way these critical water resource management bodies operate.

"We call for immediate action to address these significant failings. Farmers and communities along the Murray-Darling Basin have already been let down with the re-introduction of buybacks.

"Now we see the Basin isn't being managed properly. This is one of Australia's most important water resources and we need to see the highest standards of accountability and transparency in its management.

"The Government must urgently rectify these issues to restore already flailing confidence in Basin communities and ensure that Basin resources are managed in the best interests of all stakeholders. This is what the Minister promised but is failing to deliver."

The audit examined four key areas of compliance:

1. **Policy and Procedural Framework – *Partly Effective***

   The DCCEEW's policy framework was found to be inadequate, lacking clarity on key controls and how staff should adhere to them. Moreover, it remains unclear whether all staff were fully informed about the revised framework before critical water announcements were made public, raising questions about the integrity of decision-making processes.

2. **Training – *Partly Effective***

   The audit found serious gaps in the training provided to staff handling market-sensitive information. Of those directly involved in the Basin Transitional Grant (BTG) announcement, 50% did not attend a critical probity training session, and 85% missed water compliance training altogether. Even those who attended were not provided with adequate materials to manage sensitive information, further undermining confidence in the department's internal compliance processes.

3. **Information Barrier Arrangements – *Not Effective***

   Perhaps the most alarming finding was the DCCEEW's failure to implement effective information barriers to safeguard market-sensitive data. No clear guidance was provided on access controls, and the department failed to revoke access from staff who no longer required it, creating an environment vulnerable to breaches of confidential information.

4. **Managing Conflicts of Interest – *Partly Effective***

   Conflicts of interest were poorly managed, with 18% of staff in relevant business areas potentially accessing sensitive information without completing the necessary conflict declarations. One official involved in the BTG announcement only filed their declaration after the information had been made public, a clear breach of best practice protocols.

WATCH FOR HEATING HAY!

By Michele Jolliffe, Agriculture Victoria Dairy Extension Officer - Hamilton

Every hay season several hay stacks spontaneously combust across Victoria, in single moist bales or in a stack of any size.

Once the hay has been stacked it's important to regularly monitor it for heating and act quickly.

Unfortunately, even with technological advances in machinery for harvesting conserved fodder, there is still nothing cost effective to help monitor the internal temperatures of haystacks.

So, it's back to some very simple techniques to keep an eye on your hay stacks.

Watch for signs of heating

Keep an eye out for signs that haystack is heating. Steam condensation on the shed roof, mould growth, acrid fumes and hot, humid air at the top of the stack are all good indicators.

When building stacks with suspect wet hay, stack the bales loosely to allow air movement and spread the stack over a wider area, for example, over several bays, thereby reducing heat build-up.

Most heating will occur over the first 1 or 2 weeks but has been known to reach 'flash point' up to 8 weeks after baling. Monitor the stack temperature regularly.

Determine the stack temperature?

Stack temperature can be measured using a crowbar inserted as deep as possible into the stack and left for 2 hours. After 2 hours, the crowbar can be removed and felt by hand to give you a rough guide of the internal stack temperatures.

The temperature of the bale is up to about 50∞⌘C if you can hold the crowbar without discomfort. It is up to 60∞⌘C if the bar can be held for a short time only and up to 70°C if the bar can only be touched briefly. If you can't hold the bar, temperature is above 70°C and fire is a real possibility. Treat the stack with caution.

In the past it has been suggested to push a small pipe into the stack and lower a small thermometer to the end of the pipe to measure the temperature of warming hay.

However, this technique should not be used for severely heating hay as It may oxygenate the inner section of the stack and cause a fire to start.

What can be done if the stack heats to danger levels?

If a stack starts to get 'dangerously hot' pull it apart as quickly as possible.

Be aware that as the bales are pulled out of the stack, especially in a tightly built stack, oxygen will now get access to the hot spot and potentially cause ignition.

Make sure that water is readily available and suitably qualified people able to assist in fire suppression if required.

Safety Warning!

Avoid walking on the stack as the extremely high temperatures may have charred the centre of the stack. Any extra weight on the stack may cause the stack to collapse into the dangerously hot centre and cause serious injury.

If there is the slightest risk of a fire starting due to wet hay, never keep machinery in the hayshed and don't allow children to play in or near heating stacks.

The Country Fire Authority website has good information about hay fire risk. Search 'hay fires' at www.cfa.vic.gov.au/

For more information about dry seasonal conditions and drought support visit agriculture.vic.gov.au or call 136 186.

A DYNAMIC DUO IN TOMATOES.

Few investments have the potential to match MIRAVIS® Duo fungicide, which has become a source of excitement for IK Caldwell agronomist, Paul Elton, and his clients. "We do a two-spray strategy with MIRAVIS® Duo in processing tomatoes at Rochester, Echuca, Boort, Lake Boga and Deniliquin, as well as with fresh tomato growers around Shepparton," said Mr Elton.

"The first spray was applied early on, around pre-canopy closure, and the second one just as fruit was starting to colour. "We see a really good greening effect. Even in the [apparent] absence of disease it keeps the plant greener and healthier. "Because the plants stay greener for longer there's less premature senescence which increases harvestability." The trials also examined in-field compatibility of MIRAVIS® Duo fungicide with other products commonly used in tomatoes. "MIRAVIS® Duo is a good mixer in the tank and is really compatible with other products, including fungicides, fertiliser, biologicals and insecticides," said Mr Elton.

MIRAVIS® Duo fungicide is registered in fruiting vegetables in open field and protected cropping for control of early blight (Alternaria spp.), powdery mildew (Leveillula taurica, Odiopsis spp. and Oidium spp.) and Cercospora leaf spot (Cercospora spp.). It combines the reliability of difenoconazole (Group 3) with a new active pydiflumetofen (Group 7) to target fungi at multiple stages of the lifecycle – an important tool for resistance management. The two active ingredients provide best-in-class disease protection to deliver increased yield.

"MIRAVIS® Duo is a pretty unique and ground-breaking new fungicide. It gives me confidence to use pydiflumetofen in a whole range of other crops as well like canola, beans, potatoes and carrots," said Mr Elton.

When used as part of a preventative spray program, MIRAVIS® Duo fungicide provides protection to new flowers and developing fruit on continuously picked crops during the harvest window.

Syngenta Technical Services Lead Len Ibbotson said the collaboration with IK Caldwell and tomato growers was another example of Syngenta's commitment to post-registration stewardship and willingness to support the needs of industry. He said the results from these trials increased confidence that MIRAVIS® Duo is a highly compatible and effective fungicide, offering flexibility of timing and ease of use.

"Despite the often dry climate, periodic rainfall and an associated increase in disease pressure means fungal diseases of tomatoes in this region needed to be managed carefully with a suitable protectant program to preserve plant health and maximise yield potential ," said Mr Ibbotson.

Mr Elton agreed: "We did have high Alternaria disease pressure with rains around November-December last season and MIRAVIS® Duo held up well under those conditions."

"MIRAVIS® Duo fungicide is positioned for good residual activity, with the length of control being a product highlight" said Mr Elton.

"Whether it's a dry season or a wet one, MIRAVIS® Duo will be the foundation of the program."

"That early spray provides good protection down in the canopy early on in the season."

"[But] the one day withholding period also makes MIRAVIS® Duo really handy as a late spray for fresh tomato growers."

Ask an agronomist about a pest insect… they'll ask more questions
Cause there isn't a 'one fits all' solution to every problem

But… there is a natural product that has a wide application

A mix of complex and diverse structural isomers… there's no known resistance
An insect hit with just one tiny droplet, it will die… within minutes.
1 day witholding, spray today and pick tomorrow… no interuption

There's no point trying to 'wash' insects off the plant; you can't kill them deader than dead!
Dilute 1 litre of concentrate in 1000 litres of water; aim to use 'just enough'.

When it's an insect problem…

Kill EVERY insect you hit

- ✓ 1 Day Withholding
- ✓ **No Resistance**
- ✓ **No Bio-accumulation**
- ✓ Only 1mL per Ltr

SITUATION	PESTS	RATE
Fruit and vegetable crops, cut flowers and ornamental plants.	Aphids, ants, cabbage moths and other caterpillars, earwigs, leafhoppers, thrips, whiteflies.	1mL in 1L of water

Built on natural Pyrethrum, 6 modes of action… No resistance

On Crops

✓ 1ml per Ltr

Grain Protection

✓ 3Ltrs per 100T

Warehouse Fogging

✓ 2Ltrs per 1000² RTU

Found at most local Ag Suppliers 1800 12345 7 Pestech .com.au

TRANSPERANCY IS TRUST

REGIONAL SUMMIT EXPLORES DATA AND DIGITAL TECHNOLOGY TO TRANSFORM AUSTRALIA'S AGRIFOOD SECTOR

When agrifood experts, researchers, and farmers at the Digital Agrifood Summit discussed what's ahead for Australia's food and fibre sector, the desire for trust was a common thread.

Delegates heard trusted information can aid decision making when it comes to decarbonising current practices, that maintaining trust in sustainability claims is crucial for consumers, and that if people don't trust technology like Artificial Intelligence, they won't embrace it.

Over 320 people attended the Summit hosted by Food Agility CRC, Charles Sturt University and Charles Sturt AgriPark over two days in Wagga Wagga, NSW.

In sharing his inspiring journey of electrifying his cherry orchard in New Zealand, CEO of Rewiring Aotearoa Mike Casey told delegates that "Transparency is trust" and that's critical in helping to adopt new technology. He crunched the numbers, sharing that despite high initial purchase prices, the 21 electric machines on his farm have a lower lifestyle cost than diesel equivalents.

Ben van Delden, partner at Deloitte's AgriFood Transformation and Circularity, told delegates that Australian exporters will increasingly be asked to demonstrate their product is produced in a sustainable manner.

"Australia needs to accelerate climate smart farming practice, provide support for farmers to do the heavy lifting and focus on data exchange support to build trust," he said.

> **"Transparency is trust" and that's critical in helping to adopt new technology**
>
> **Mike Casey**
> **CEO of Rewiring, Aotearoa, New Zealand**

Other highlights from the event:

- **320+ attendees**
- **50+ agtech exhibitors** at the Digital Agrifood Summit expo
- **New technology** for transportable hydrogen power, emissions-free water pumping, gas and fertiliser production from ag waste, solar thermal, seeds to biodiesel, and high accuracy methane sensing are among the opportunities identified in Australian Agri-renewables Innovation Challenge. An initiative of Food Agility, Charles Sturt AgriPark and RACE for 2030 CRC, the challenge has a multi-million pool for co-investment and includes opportunities to test and scale innovative technology and services in areas of: energy, fertilisers and chemicals and ag waste and residues. Impacts Renewable Energy Pty Ltd, CLEAN Bioenergy Pty Ltd, Alt-Tech, Seed to Diesel, H2 Core Systems and University of Sydney have been named at the Summit as 'Challengers' to develop their proposals for the next stage of the Challenge.
- **A debate** featuring two academics, a farmer and technology developer, and digital transformation expert challenged audience perceptions of how to harness the potential of Artificial Intelligence in the agrifood sector. The final poll found 56 per cent of the audience were in favour of maintaining control.

The Summit started with a farmer-focused expo on the Global Digital Farm, featuring demonstrations of a range of technology, from autonomous tractors, a robotic dog, and hands-free sheep handling machinery.

AgriPark Executive Director Mr Nick Pagett said, "It was a unique opportunity to see a range of agtech advancements and for primary producers to gain firsthand insights into the future of sustainable farming."

Food Agility Chief Executive Officer Dr Mick Schaefer said, "There's some big challenges ahead for Australian agriculture with a changing climate impacting production, new access export access requirements and increased consumer demand for transparency about how their food is produced.

"The Digital Agrifood Summit has highlighted the role of emerging technology in tackling these challenges, with opportunities for decarbonisation, improved farm management, and capturing and sharing the data needed to prove our sustainability credentials on the world stage."

Major sponsors of the Summit were the Australian Government Department of Agriculture, Fisheries and Forestry and Deloitte.

ABARES REPORT

HORTICULTURE OUTLOOK

KEY POINTS

- **Gross value of horticulture production to reach a record high of $17.8 billion in 2024–25.**
- **Domestic production and export volumes to rise, driven by higher yields for fruit and nuts.**
- **World demand for fruit and nuts to increase, driven by high value markets like China, Japan and Korea.**
- **World supply of fruit and nuts to rise, reflecting improved growing conditions for major producers.**

Value of production to reach a record high

The gross value of horticulture production is forecast to rise to a record $17.8 billion in 2024–25, up 4% from the previous record of $17.2 billion in 2023–24 (Figure 1.1). Rising production values reflect increased production volumes and higher prices for export focussed industries. Average to above-average seasonal conditions in key growing regions and more trees reaching maturity are forecast to lead to higher yields of fruit and nuts. Prices for export focussed industries such as citrus, nuts, and table grapes are expected to increase, driven by rising global demand from high value markets such as China, Japan and Korea. However, growth in horticultural demand is expected to outpace modest growth in global supply, increasing global prices.

The gross value of horticulture production in 2024–25 is forecast to be around $330 million higher than the forecast in the June 2024 Agricultural Commodities Report. This reflects an upward revision to production volumes for fruit and nuts.

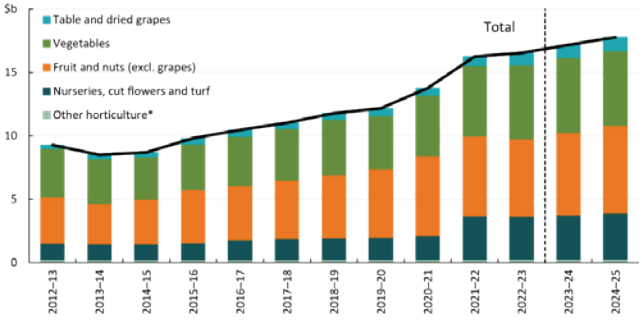
Strong global demand to drive record export values

The value of horticulture exports is forecast to rise by 19% to a record $4.1 billion in 2024–25, driven by higher production volumes and export prices (Figure 1.2). A relatively low Australian dollar is expected to support export competitiveness through 2024–25. Increases in export values for fruit and nuts are the main commodities driving growth:

- **Almond and macadamia export values** are forecast to rise to $1.4 billion in 2024–25 reflecting higher export volumes and a rebound in world prices.
- **Citrus export values** are forecast to rise $626 million in 2024–25, driven by higher export volumes and increased global demand from high value markets, such as Japan and Korea.
- **Table grape export values** are expected to increase in 2024–25, driven by higher export volumes and expanded market access to Japan. Exporters are now able to export over 130 varieties to Japan, following the removal of varietal restrictions in July 2024.

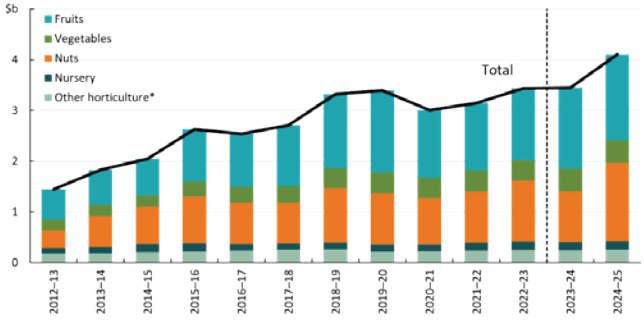
The forecast value of horticulture exports for 2024–25 is broadly in line with the *June 2024 Agricultural Commodities Report.* The forecast is slightly higher due to an upward revision to export volumes and export prices for fruit and nuts.

FIGURE 1.1 GROSS VALUE OF AUSTRALIAN ANNUAL HORTICULTURE PRODUCTION



Note: Data to the right of the dotted line indicates estimates and forecasts. *Other horticulture includes coffee, essential oils, spices, tea, vegetables for seed, and other miscellaneous horticultural products. **Source:** ABARES; ABS; Hort Innovation

FIGURE 1.2 ANNUAL VALUE OF AUSTRALIAN HORTICULTURE EXPORTS



Note: Data to the right of the dotted line indicates estimates and forecasts. *Other horticulture includes coffee, essential oils, spices, tea, vegetables for seed, and other miscellaneous horticultural products. **Source:** ABARES; ABS

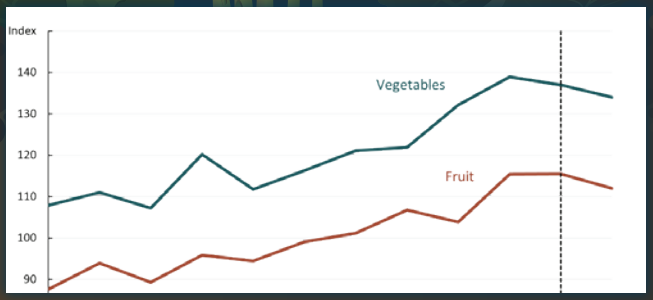
$18B
VALUE OF PRODUCTION 2024-25

HIGHER PRODUCTION VOLUMES WITH MORE FAVOURABLE CLIMATIC CONDITIONS

Strong global demand to drive record export values

Domestic fruit and vegetable prices are expected to decline in 2024–25 as higher production volumes more than offset an expected rise in domestic demand (Figure 1.3). Easing pressure on disposable incomes is expected to drive higher domestic demand for fresh produce, and alongside lower prices, support greater fruit and vegetable consumption in 2024–25.

FIGURE 1.3 AVERAGE ANNUAL AUSTRALIAN RETAIL FRUIT AND VEGETABLE PRICE INDEX



Note: Index 2011–12 = 100. Yearly average of the ABS Consumer Price Index. Data to the right of the dotted line indicates forecasts. **Source:** ABARES; ABS

Australian production values to increase

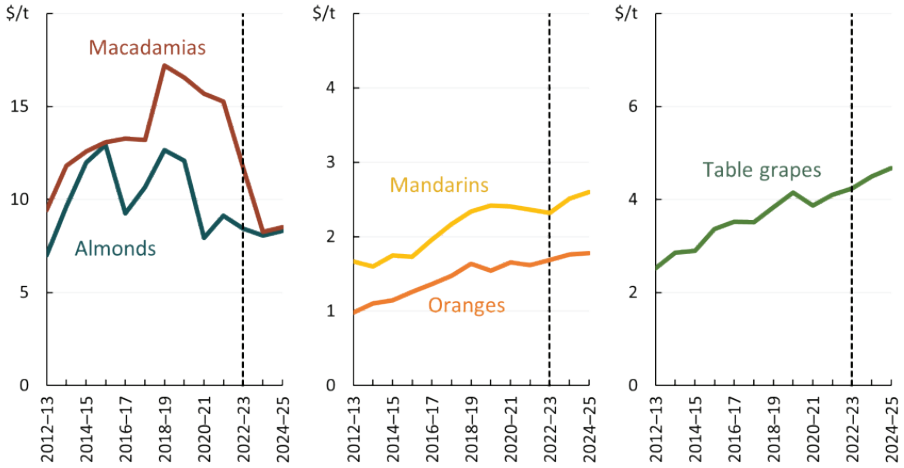
Horticulture production is forecast to rise in 2024–25, driven by increases to planted area and expected higher yields for fruit and nuts. Large areas of citrus and nut trees planted in recent years are expected to reach bearing age and enter production in 2024–25, driving the expected increase in yields. In addition, favourable growing conditions and easing input pressures are expected to support increased production for most horticulture commodities:

- **Almond production** is forecast to increase by 16% to 176 thousand tonnes in 2024–25, driven by increases to bearing area, favourable growing conditions and high water availability in the Riverina, Sunraysia and Riverland regions. This increase follows an estimated record 152 thousand tonne crop in 2023–24.
- **Macadamia production** is expected to increase by 10% to 56 thousand tonnes in 2024–25 driven by higher yields. Lower input costs (see Box 1.1) and expected higher farmgate prices are forecast to incentivise greater fertiliser application and improved orchard management practices.
- **Citrus production** is forecast to increase in 2024–25, driven by higher yields for oranges and mandarins as more trees mature and enter production. With a neutral climate outlook through spring, the 2024–25 crop is not expected to face significant disease pressures (such as albedo breakdown) that have impacted crops in recent years.
- **Vegetable production** is forecast to remain steady in 2024–25. High water availability, a neutral climate outlook and falling input costs are expected to support higher yield potential; however, production is expected to be constrained by low prices and subdued domestic demand.

Horticulture export prices are forecast to rise in 2024–25, driven by strong demand from high value markets and higher quality Australian exportable supplies (Figure 1.4):

- **Almond export prices** are forecast to rebound in 2024–25 but are expected to remain below the 10-year average in real terms. Record-breaking production in the United States in 2020–21, coupled with above-average production volumes in the following years, resulted in high global carryover stocks, driving down global prices. However, in 2023–24, US exportable supplies were affected by quality issues due to orangeworm, leading to a reduction in global stocks. Low stock levels are anticipated to persist into 2024–25, supporting a recovery in global prices.
- **Macadamia export prices** are expected to increase in 2024–25 but remain well below the 10-year average in real terms. Strong import demand from China has driven a slight recovery in global prices, however, increased global supply is expected to continue putting downward pressure on prices.
- **Table grape export prices** are expected to increase with strong global demand from high value markets such as China and Korea, remaining above the 10-year average in real terms.
- **Mandarin and orange export prices** are expected to increase in 2024–25 and remain above the 10-year average in real terms. This reflects improved quality of exportable supplies following more favourable growing conditions in 2023–24 and continued strong demand from high value markets such as Japan, China and Korea.

FIGURE 1.4 ANNUAL EXPORT PRICES FOR SELECTED COMMODITIES



Note: Data to the right of dotted line indicates estimates and forecasts. Export prices calculated as export unit values (export value divided by export volume). **Source:** ABARES; ABS

Easing input pressures to support higher production

Falling input prices are expected to support higher production for most horticultural commodities in 2024–25. Lower input prices can allow greater investment in farm management practices, supporting yields and in turn production volumes. Fuel, fertiliser and chemical costs are expected to ease, following significant increases from 2020–21 to 2022–23 (see Economic Overview).

High water availability and low water prices are expected to continue into 2024–25. Despite falling from last year, major water storage levels are still sitting well above long-term averages, supporting production for irrigated horticulture.

Labour availability issues eased for horticultural businesses in 2023–24 and are expected to stabilise in 2024–25, driven by a relatively high number of overseas temporary worker arrivals. The availability of workers for short periods during the year is critical for labour-intensive operations (such as planting and harvest) on many horticulture farms. Horticulture crops are often harvested only once a year and – in some regions – harvest operations occur only over a few weeks. These brief labour-intensive operations align with the short-term availability of many overseas workers. Horticulture producers faced significant workforce challenges from 2019–20 to 2022–23 due to constraints on large-scale international travel and migration to Australia. Labour availability improved in 2023–24, in part due to increased utilisation of the Pacific Australia Labour Mobility (PALM) scheme, as well as the Working Holiday Maker program, which can be more appealing to smaller horticulture businesses. The number of PALM scheme workers increased slightly between January and June 2024, and together with declining demand for labour in the broader Australian economy (see Economic Overview), is expected to support labour availability for horticulture businesses.

Export volumes to rise with increased production

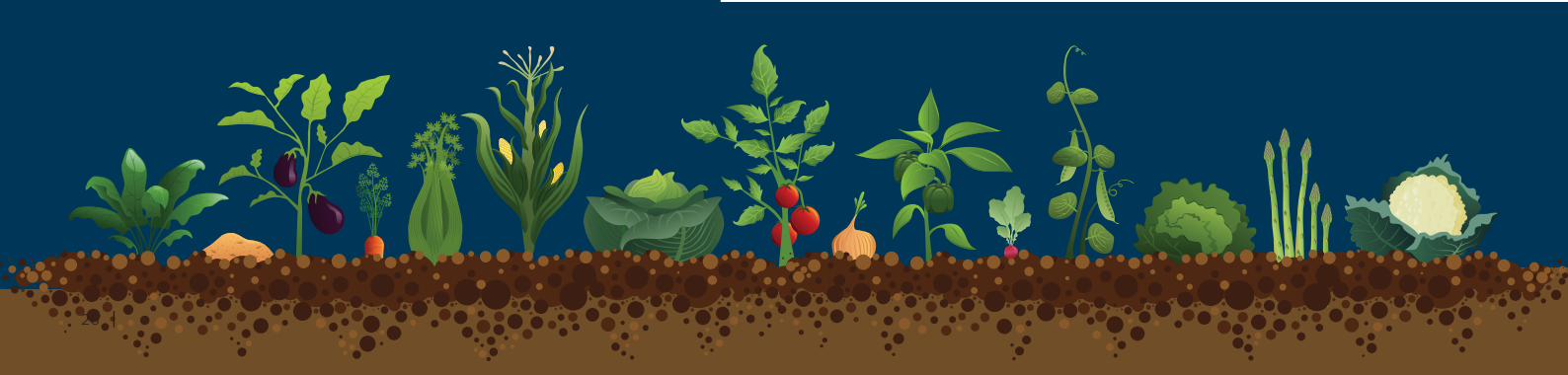
Australian export volumes are forecast to rise in 2024–25, driven by higher production and increased global demand. Improved growing conditions are expected to enhance fruit quality and increase harvest volumes for tree nuts, table grapes and citrus fruits:

- **Almond and macadamia export volumes** are forecast to rise in 2024–25, reflecting higher domestic production and strong global demand from high value markets.
- **Citrus export volumes** are expected to increase in 2024–25, driven by higher domestic production and strong global demand.
- **Table grape export volumes** are forecast to rise in 2024–25, driven by strong production and increased market access to Japan. Exporters will now be able to export over 130 table grape varieties to Japan, following the removal of variety restrictions in July 2024. Prior to the announcement, Australian exporters could only export three varieties of table grapes – Crimson Seedless, Red Globe and Thompson Seedless. Additionally, income growth in emerging economies, such as Indonesia and Vietnam are expected to drive demand for Australian table grapes and further support price growth.

World demand in high value markets continue to rise

World demand for horticultural commodities is forecast to increase in 2024–25. Population growth and rising incomes in emerging markets continue to drive growth in demand for high quality produce:

- **World tree nut demand** – such as almonds and macadamias – is expected to increase, fuelled by a growing health-conscious consumer base. Demand from India, the world's largest export market for almonds, is expected to remain strong, with rising per capita incomes.
- **World fruit demand** is expected to rise, driven by demand for high-quality premium fruit in markets such as Japan, China and Korea. India's demand for fresh fruit continues to increase, driven by population growth and an expanding middle class.



World supply to rise with higher production

World horticulture supply is forecast to increase in 2024–25, driven by higher production in key growing regions. However, the growth in demand for horticulture is forecast to outpace the growth in supply, increasing global prices.

- **World almond supply** is expected to rise, driven by an expected increase in the Californian almond crop for 2024 after consecutive years of lower production. The increase in global production will be partially offset by reduced carry-in stocks due to crop quality issues that impacted the 2023 California almond crop.
- **World macadamia supply** is expected to rise, driven by the transition of planted areas from non-bearing to bearing. High macadamia prices prior to 2022–23 saw significant expansion of macadamia plantations, especially in China, South Africa and Australia.
- **World fruit supply** is forecast to increase driven by rising global demand incentivising higher production volumes from major exporters. Favourable growing conditions are expected to support higher yields in the US and China offsetting expected poorer yields out of the European Union and South America.

Opportunities and challenges

Improved market access key to export growth

Australian horticultural exports are expected to increase significantly over the next decade, driven by higher production, particularly for almonds and citrus fruits. Expanding Australia's export destinations and improving market access in emerging markets will be critical to supporting value growth. The Australia-India Economic Cooperation and Trade Agreement (ECTA) has created new export opportunities for Australian horticulture. Entered into force on 29 December 2022, ECTA provided an immediate 50% tariff reduction within an annual quota of 34 thousand tonnes for almonds and 13,700 tonnes for oranges and mandarins per calendar year as well as the phased elimination of tariffs for a number of other horticultural commodities.

Although welcome news for Australian exporters, the outcomes under ECTA have not yet resulted in a significant increase in volumes of almonds, oranges or mandarins exported to India. In the five years prior to the quota being introduced, almond exports to India averaged 19% of Australia's total almond exports. In 2023, the first full year since the quota was introduced, Australia underutilised the quota, exporting 24,000 tonnes of almonds to India (accounting again for 19% of total exports) (Figure 1.5). Trade data indicates a similar trend for oranges and mandarins (Figure 1.6).

With a large population, emerging middle class and rising disposable incomes, India presents a significant opportunity for Australian horticulture exporters over the long term. For example, India's almond imports more than doubled, and orange imports more than tripled over the last ten years. As a southern hemisphere producer, Australia can support India's growing demand for high quality produce by providing counter seasonal supply. The challenge is increasing demand for Australian produce in a market with significant competition from other major exporters such as Egypt and South Africa (oranges) and the United States (almonds). Ongoing negotiations for a broader Comprehensive Economic Cooperation Agreement (CECA) may provide further opportunities for Australian horticulture.

FIGURE 1.5 VOLUME OF AUSTRALIAN ALMOND EXPORTS TO INDIA

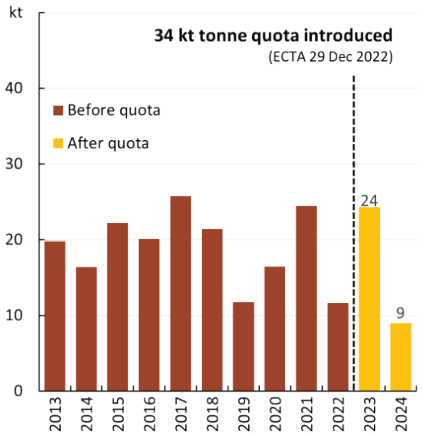
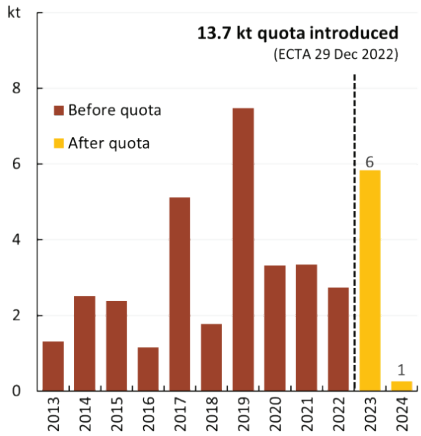
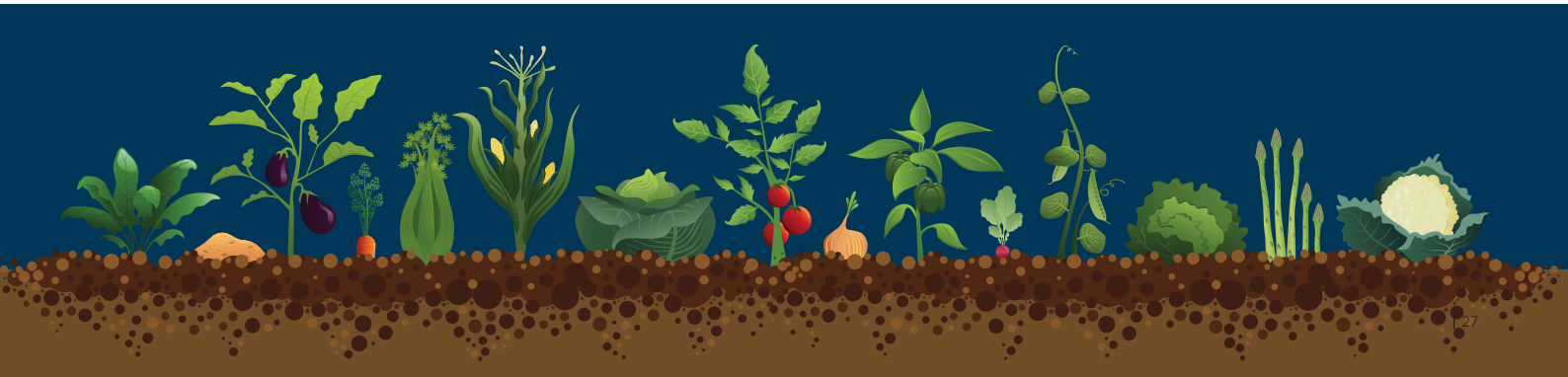


FIGURE 1.6 VOLUME OF AUSTRALIAN ORANGE AND MANDARIN EXPORTS TO INDIA



Note: Data to the right of the dotted line indicates estimates and forecasts. *Other horticulture includes coffee, essential oils, spices, tea, vegetables for seed, and other miscellaneous horticultural products.
Source: ABARES; ABS



Nuseed Area Sales Manager - WA Northern, Callum Pestell (second from left), together with Karlgarin growers Lindsay Marsh as well as Baylee and Andrew James, are tipping at least an average yield of 1.5 tonnes per hectare for their community crop of the TruFlex® hybrid canola variety, Raptor TF, donated by Nuseed this season.

INDUSTRY LOCALS HELPING SMALL WA COMMUNITY TO THRIVE

COMMUNITY CROPS CONTINUE TO BE A VITAL FUNDING TOOL FOR SMALL RURAL COMMUNITIES, BUT THEY ALSO RELY ON CONSIDERABLE VOLUNTEERING AND SIGNIFICANT CONTRIBUTIONS FROM GROWERS' OWN SUPPLIERS TO REALLY MAKE A DIFFERENCE.

As is renowned with rural communities, entire local industries pull together to ultimately maintain and improve their own facilities, services and activities, and to take responsibility to support their own lifestyles.

In Western Australia this season, Nuseed, one of the country's major canola seed suppliers, decided to throw its support behind a number of community crops.

The campaign followed the company's broader national commitment late last year to the Foundation for Rural and Regional Renewal (FRRR) and its Strengthening Rural Communities program.

Nuseed Regional Sales Manager West, Hugh Trenorden, said the company's local team wanted to further increase its involvement with rural communities and it took the opportunity to donate seed of its TruFlex® hybrid canola variety, Nuseed Raptor TF, to community crops at Karlgarin, Corrigin and Three Springs.

Karlgarin grower Andrew James, President of the town's Progress Association, which manages the local community crop, said rural communities could apply for government grants, but they also recognised the need to generate their own funding and he said they were elated to receive the Nuseed donation this year.

"The Raptor seed is by far the biggest contribution we have received. It was awesome," Andrew said.

The Progress Association, which comprises 32 members, purchased 187 hectares of land in 2013 to commence their community crops, which cost $50,000-$70,000 to produce. Final payments on the land were completed last year.

Andrew said the Association's membership was strong despite the small size of the town, and now with many younger families also taking an active role in the community and helping to create a healthy vibe, the funding was supporting numerous clubs and essential services including tennis, bowling, the Karlgarin Country Club, St John and Silverchain.

The land comprises various soil types, ranging from sands to crabhole red country, weed control is a key challenge like in most farming operations, and this year extensive soil testing was carried out also to help correct pH levels, with agronomy support offered by local consultant, Kelly James.

The block was chemically fallowed last season after growing wheat, canola and hay crops in previous years, and the Nuseed Raptor TF canola seed for this season was donated in conjunction with local agent, Lourens De Jager from Delta Agribusiness at Hyden.

One of the first TruFlex® hybrid canola varieties, offering the benefit of a wider spraying window with glyphosate-tolerant technology, Nuseed Raptor TF is an early to mid-maturing variety with good vigour and standability, and it has consistently shown robust yields compared with Roundup Ready® varieties.

Andrew said glyphosate-tolerant hybrid varieties had become an important tool for growers and achieved higher yields, however there also was an awareness to be careful with glyphosate applications.

Nuseed Area Sales Manager - WA Northern, Callum Pestell, said he had seen some strong results with Nuseed Raptor TF's compact plant height and strong blackleg rating.

"Where some varieties are coming under pressure with blackleg, we are seeing the strength of Raptor's competitive advantage in these areas," Callum said.

He said as an AD blackleg group variety with a R rating for the disease, it also offered stronger resistance to blackleg, which, although was not a significant issue around Karlgarin, was recognised by local farmers as a significant threat to production generally.

Seeding the community crop can be contracted to local clubs seeking funding, and this year the Hyden Karlgarin Football Club sowed the crop on April 17 following a surprising 3-kilometre wide shower that delivered 14 millimetres of rainfall over the property. It also followed another fortunate summer rainfall event that dumped 150mm over the area.

Hi-Cal lime was applied at 800 kilograms/ha over half the area earlier and the Nuseed Raptor TF was drilled with a CropStar/ Muriate of Potash fertiliser blend at 65kg/ha and Aquifer soil moisture retainer, which local grower Lindsay Marsh has had strong success with. NS61 also was applied upfront at 60kg/ha and again in June at the same rate.

Further rainfall was not received until May, but Lindsay said the canola jumped out of the ground quickly and its cabbaging "was amazing".

"The Raptor cabbaged-up massively," Lindsay said.

The community crop enjoyed consistent rainfall from May, while the two glyphosate applications in the Nuseed Raptor TF crop also have kept grasses under control and the only other application required was insect treatment earlier.

The community crop is set to be direct headed and Andrew and his son, Baylee, together with Lindsay and Callum, have estimated a yield average at least around 1.5 tonnes/ha for the community.

Nuseed Area Sales Manager - WA Northern, Callum Pestell (second from right), with Karlgarin growers Lindsay Marsh as well as Baylee and Andrew James at the local bowling club that benefits from the Karlgarin Progress Association's community crops.

Baylee, Lindsay, Callum and Andrew with a historical mural created at the Karlgarin Country Club.

The Karlgarin Progress Association Inc, together with the local community, celebrated 100 years in 2020.

GROWTH IN FOOD SAFETY STANDARDS FOR BERRIES, LEAFY GREENS AND MELONS

NEW FOOD SAFETY STANDARDS FOR GROWERS OF BERRIES, LEAFY GREEN VEGETABLES AND MELONS WILL COME INTO EFFECT FROM 12 FEBRUARY, 2025, MAINTAINING THE STATE'S REPUTATION AS A RESPONSIBLE PRODUCER.

Food Standards Australia and New Zealand introduced the new food safety and compliance standards in 2022 to the National Food Standards Code.

Agriculture Victoria Horticulture Standards Engagement Officer, Emily Scott said the standards will assist in lifting food safety standards across the industry.

'We are working closely with industry bodies and growers to support businesses implementing the new standards with a timely awareness and engagement campaign. Current food safety arrangements are recognised where possible, and our online system assists in documenting and verifying requirements', said Miss Scott.

'The Standards apply to businesses of any size that grow or complete primary or 'early-stage' processing such as washing, trimming, sorting, sanitising or storing of berries, leafy vegetables or melons.

'It is worth noting that many businesses are already meeting the requirements in the standards, through their participation in industry food safety schemes.

'However, there will be new registration requirements which are managed through Agriculture Victoria Connect.

'If you grow leafy greens, melons or berries in Victoria, I encourage you to visit the Agriculture Victoria website to learn more about the implementation of the Standards across Victoria, and to sign up for the Food Safety Standards e-news and keep up to date with upcoming events.'

Agriculture Victoria is holding a webinar on Tuesday 10 December for berry, leafy vegetable and melon producers to learn more about the new Primary Production and Processing Standards. Register for the webinar here.

The webinar will cover key microbial food safety risks, what is required to comply with the Standards for each industry, how Global Food Safety Initiative schemes will be recognised, indicative costs and where to access useful information and resources. Growers of all sizes are encouraged to attend.

All producers are still obliged to ensure food for sale is safe and suitable for human consumption prior to this new Standard commencing on 12 February 2025.

For more information, visit the **Agriculture Victoria website**

GRDC is investing $8.8 million dollars on behalf of grain growers in an innovative $13.6 million plant protein project set to position Australia to capitalise on growing consumer demand across the world.

PULSE PROTEIN RESEARCH TO MEET GLOBAL DEMAND

AN INNOVATIVE NEW $13.6 MILLION PLANT PROTEIN PROJECT IS SET TO POSITION AUSTRALIAN GROWERS AND THE NATION'S PROCESSING SECTOR TO CAPITALISE ON GROWING CONSUMER DEMAND BOTH NATIONALLY AND ACROSS THE WORLD.

The four-year project is an initiative of the Victorian Government in partnership with GRDC, as well as key industry collaborators.

This week, Victorian Minister for Agriculture Ros Spence announced the research project, which will be delivered at the Horsham SmartFarm.

The $13.6 million project includes $2.4 million from the Victorian Government, $8.8 million from GRDC invested on behalf of Australian grain growers, along with $2.4 million from industry collaborators.

Minister Spence said her government was committed to working with the grains industry to deliver innovative research to help all parts of the supply chain provide the plant-based protein options that consumers throughout the world are looking for.

The national project will involve a whole of value chain participation involving 13 subcontractors, food and ingredient manufacturers and processors, as well as an international partner. The information generated will assist Australian processors to reliably access pulse grains that have the correct quality attributes to meet market demands.

It will also help Australian pulse breeders develop varieties with quality traits that are market driven. This in turn will support Australian growers to grow pulse varieties matched to market demand and ensure consumers are getting the product they want.

GRDC Board Chair and southern grain grower Sharon Starick said GRDC was proud to support this critical pulse protein research.

"As GRDC seeks to optimise productivity and increase the production of pulse crops as part of profitable farming system for Australian growers, it is essential that Australian pulses are fit-for-purpose for existing and new markets," she said.

"This national project seeks to maintain Australia's competitiveness and capitalise on emerging growth opportunities in value addition and provide opportunities to capture value from greater levels of onshore processing that attract higher premiums for growers as well as providing a diversity of markets."

The project will capitalise on the growing plant-based protein market, with demand for these foods forecast to surpass $250 billion globally by 2035.

Importantly, this research has the potential to have far-reaching implications for Australia's agricultural sector by improving grain functionality, which will support value adding and allow farmers to better meet market needs. These in turn is expected to generate new export opportunities and increase jobs along the supply chain.

Australia exports on average 2.5 million tons a year, making us the second largest pulse exporter in the world. More than 90 per cent of Australia's pulses are exported as whole unprocessed grains, with prices defined by visual quality and used primarily for human consumption with a small proportion sold into the lower value, domestic livestock feed market.

Victoria is a major contributor to Australia's pulse industry, generating $638 million in export income in 2022-23.

Pulse crops are seen as a valuable contributor to more sustainable and profitable farming systems by improving environmental and human health outcomes. Pulses also offer many human health benefits, including being a nutritionally dense food, a good source of both fibre and protein, low in fat, no cholesterol and a low glycaemic index.

Investment in pulse research is part of the Victorian Government's Agriculture Strategy, which is working towards enhancing the commercialisation of research and innovation, ensuring our agriculture sector is stronger, more innovative, productive, and sustainable.

Rider numbers were the biggest ever at the annual ADAMA 2-Wheel Trial Tour this year, which included an inspection of herbicide tank mixtures containing Tenet in canola.

The group also visited Rohan Marold, who spoke about some of the systems he is using to overcome issues associated with high rainfall waterlogging country, including drones to carry out input applications over wet areas, as well as tile drainage.

The big line-up of motorbikes and riders at another crop site during the ADAMA 2-Wheel Trial Tour

MOTORBIKE TRIALS TOUR HITS NEW HEIGHTS AT ESPERANCE

Western Australia's Esperance region has long been a fascination for many agricultural enthusiasts and it proved so again during the State's annual motorbike crop trials tour recently.

The ADAMA 2-Wheel Trial Tour attracted its biggest ever rider numbers from all points of WA's agricultural region, bringing together growers, farm consultants and other industry colleagues to explore the diversity of the area both inland and along the coastline.

Numerous riders added to the event's longer format this year with visits to areas including the Goldfields, and the group enjoyed magnificent riding weather and appreciated strong community support, including at its "base camp" at the Esperance Bay Turf Club.

The event highlighted a range of research and industry development throughout the region, as well as local activities and popular sites.

The performance of ADAMA Australia's Tenet pre-emergent and early post-emergent canola herbicide in mixes with glyphosate, glufosinate and clethodim was viewed in InVigor LR canola.

WA Market Development Manager Bevan Addison said the trial showed the value of stacking multiple herbicide modes of action for maximum weed control and resistance management benefits.

He said growers had the opportunity to mix Tenet with either of the herbicides to achieve the best outcome for their particular situation.

"Across many of our trials over multiple sites and seasons, the addition of Tenet to any of the herbicides, or to a tank-mix combination, has provided improved initial and residual weed control, resulting in a reduced grass weed burden at the end of the year," Bevan said.

A visit to the Esperance Downs Research Station compared traditional and modern farming practices with DPIRD research

Wheel Trial Tour riders were also treated to the famous Esperance coastline and beaches this season.

scientist Tom Edwards, highlighting the significant gains made with latest systems and, hence, the importance of industry strategy development for the area.

Bevan said adoption of various soil amelioration techniques such as claying and use of knife point/press wheel systems and products like soil wetters had advanced crop establishment enormously compared with previous times and contributed to improved crop yields over recent decades.

“Where non-wetting soils, potential for wind blow and poor weed control were all limiting crop production in the area, these have largely all been overcome, resulting in high production that we now see across the various areas around Esperance.”

The impact of some of the latest practices on herbicide performance also was discussed at the station.

At another major development site, long-term local industry identity Andrew Heinrich, Pacific Seeds, updated the group on some of the latest canola varieties suiting farming systems in the area before visits to several growers in the region.

Rohan Marold took the group through some of the systems he is using to overcome issues associated with high rainfall waterlogging country, including tile drainage and drones to carry out input applications over wet areas.

Sam and John Fetherstonhaugh discussed returning tree farming country back to agricultural production, while standing in front of a barley crop that has potential to achieve 5t/ha crop yields in their first year.

Scott Wandel highlighted farming in the lower rainfall areas north-east of Esperance, where lentils and cereals are the key drivers of the family’s cropping enterprise and they have established an on-farm workers village to successfully attract staff. The Wandels also have a beef property near the coast, where digital collars and virtual monitors are being used to monitor cattle movements.

Ash Reichstein and his wife, Megan Mcdowall, also updated the group on their farming operation and some of the activities and projects being undertaken by the local Mt Burdett Foundation, the concept of Ash’s late brother, Chris.

Bevan said other research taken in by the group included Field Applied Research (FAR) Australia’s Hyper Yielding Crops site, where Managing Director Nick Poole discussed several projects, as well as a look at the growing problem of red-legged earth mite (RLEM) resistance in the area and its control in canola with Clarke and Stokes Agriservices Agronomist Lucy Burrows.

Bevan said across many areas of WA, RLEM had developed resistance to synthetic pyrethroid and/or organophosphate insecticides; it had caused havoc in canola crops in recent years; and concerns had only heightened since the chlorpyrifos label review and loss of this versatile product from control programs.

He said RLEM was seldom fully controlled in cereal crops within rotations and a targeted approach was required to reduce numbers and help ease the pressure in following canola crops.

“Timerite sprays have historically been carried out in pastures before growing canola, and grazing also can help, but we need to improve control in the cereal phases as well. With less livestock and pasture in the system, more growers are planting canola on cereal stubbles that have diapause eggs from heavy RLEM infestations in the previous years.”

Lucy showcased the performance of ADAMA Australia’s Receptor insecticide against a resistant RLEM population in canola.

Bevan said Receptor was a novel Group 12A insecticide with no known resistance and could help growers where these issues were emerging, and now within different phases of their crop rotations.

“Receptor is currently registered for use against RLEM in canola, but also has recently gained permit for use in cereals and grain legumes,” he said.

“It mixes well with many herbicides, so can be applied with a range of products to help achieve early season control of RLEM.”

The 2024 motorbike trials event concluded with a tour of Lucky Bay Brewing with Nigel Metz, who has a strong rural backgound and highlighted the brewery’s use of local grain and its contribution to the area’s tourism.

ONGOING DECLINES IN APVMA PERFORMANCE TAXING AN OVERBURDENED FARMING SECTOR

The most recent Australian Pesticides and Veterinary Medicines Authority (APVMA) performance statistics show over one in four new plant product assessments are no longer completed within legislated time frames – creating real costs for farmers and families.

For over two years, the APVMA's time frame performance for major pesticide applications continue to languish below mandated statutory time frames, with performance in the most recent quarter sitting at just 72.3 per cent of applications completed on-time.

"This disappointing performance continues to fail Australian farmers, creating delays in their ability to access to the latest innovative crop protection farming tools," said Chief Executive Officer of CropLife Australia, the national peak industry organisation for the plant science sector, Mr Matthew Cossey.

"These delays add yet another hurdle to the ability of Australia's farmers to complete globally. It means they have fewer options available to them to protect crop yields and leaves them facing higher costs from damage caused by devastating insects, weeds, and diseases.

"The prolonged period of below expected performance also seriously undermines the plant science industry's capacity to support Australian agriculture.

"With challenges to our agricultural sector coming from climate change, as well as new and emerging pests such as Fall armyworm, access to the latest agricultural chemical technologies are important to curbing the cost-of-living pressures felt by families right across Australia. At a recent Senate Estimates hearing, the APVMA admitted the Government's increased expectation for it to finalise a number of chemical reviews has severely impacted its ability to meet its statutory timeframes for new pesticides.

"Government funding is critical to resourcing the APVMA's public good functions, such as chemical review, allowing cost recovered funds to be devoted to ensuring new chemical technologies get into the paddock when they are needed.

"With fees and charges ultimately paid by farmers, proposals that seek to increase the APVMA's cost recovery will only doubly penalise Australian farmers; increasing the cost of critical farm-inputs and further delaying access to new products already available to farmers in larger markets.

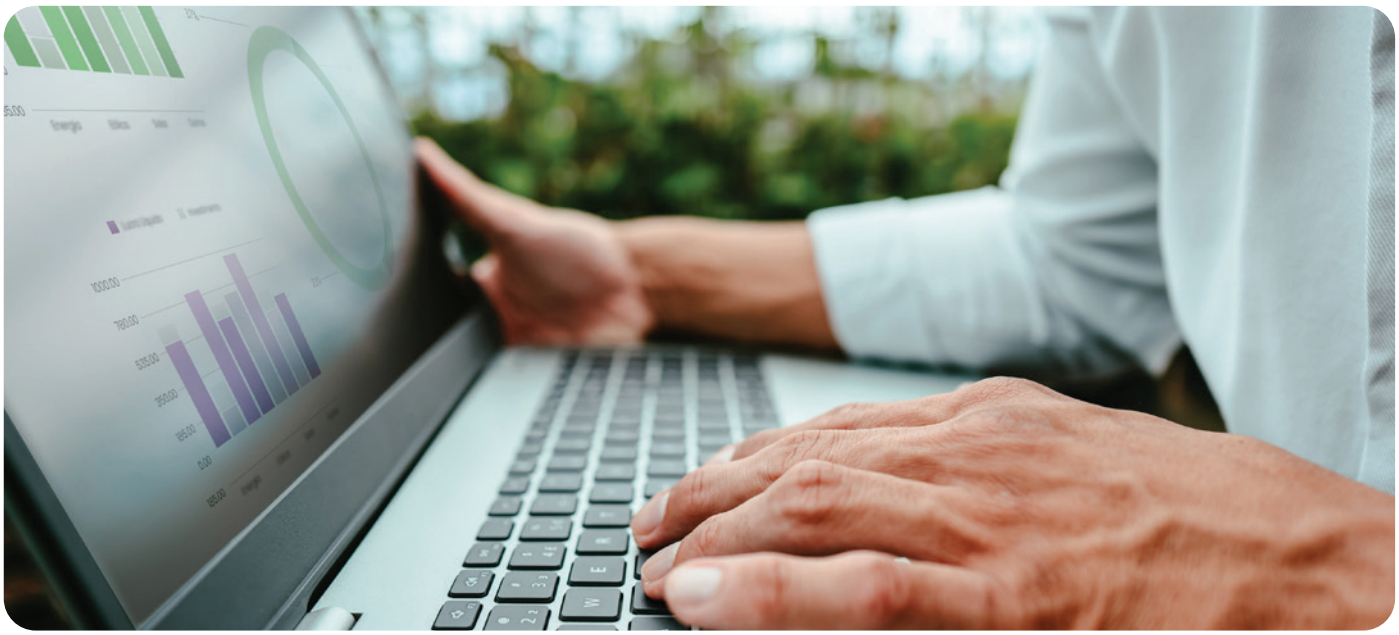
"The greater demands placed on the APVMA by the Government mean the current proposal to increase its resourcing through higher levels of cost recovery is akin to placing a band-aid over the structural long-term needs of the regulator.

Presently, the APVMA is the only pesticide regulator in the OECD that does not receive Government funding to cover the public good outcomes it creates through the essential functions of reviewing chemical safety and undertaking compliance and enforcement activities.

"While the reported results are disappointing, the opportunity for improvement exists as the APVMA's dedicated team of professional regulatory scientists and specialist staff settle under the management of new CEO Scott Hansen.

"However, if the Government is to truly claim the legacy of delivering the pesticide regulator Australian's deserve, it is time for it to step up to the plate and deliver the funding that will deliver the sustainable resource base it needs to make it happen.

"This funding is essential to the APVMA being able to deliver the full breadth of its regulatory functions, delivering its statutory objective of enhancing the economic viability of Australia's primary industries by ensuring farmers have access to safe and effective chemicals," concluded Mr Cossey.



PIONEERING THE FUTURE OF AGRICULTURE IN AUSTRALIA AND NEW ZEALAND

As the agricultural sector continues to evolve, the need for innovative solutions that promote sustainability, and crop resilience has never been more critical. In this context, the recent collaboration between New Edge Microbials (NEM) and global leader Lallemand heralds a new era for growers in Australia and New Zealand. Launching three groundbreaking products in Australia this November, this strategic partnership takes a significant step towards enhancing crop performance and addressing the challenges posed by increasingly harsh environmental conditions.

The trio of products—LALSTIM® OSMO SP, LALRISE® MAX WP, and LALRISE® START SC—offer exciting advancements for agricultural practices.

LALSTIM® OSMO SP is a plant care product designed to protect crops from various environmental stresses, such as heat, drought, salinity, and cold. The product is a natural osmoprotectant, which helps plants regulate their water uptake and maintain cellular integrity under stressful conditions. It enhances photosynthesis, nitrogen metabolism, and nutrient translocation, making plants more resilient to adverse environmental conditions.

Meanwhile, LALRISE® MAX WP employs MYCONNECT® TECHNOLOGY, utilising mycorrhizal fungi to enhance nutrient uptake and promote drought tolerance across various crop rotations. By facilitating faster root colonisation, this mycorrhizal inoculant maximises yield potential while safeguarding plant health.

Completing this innovative suite is LALRISE® START SC, a plant growth-promoting rhizobacteria that fortifies young plants during their critical establishment phase. By improving root vigour and enhancing nutrient and water uptake, it optimises overall productivity, leading to increased growth, yield, and crop quality.

At NEM, our commitment to excellence is unwavering. Collaborating with over 400 leading scientists worldwide and aligning with prestigious research institutions, we continuously strive to drive forward sustainable farming practices. Our aim is not only to enhance plant resilience but also to unlock nature's potential for improved crop yields.

Underpinning this innovative product launch is Lallemand, a cornerstone in the microbiological solutions industry since the late 19th century. With operations in 50 countries, their extensive experience and leadership in microbiological technologies significantly bolster our mission.

The New Edge Microbials team has collaborated relentlessly with industry leaders, growers, and influencers to grasp the evolving needs of Australian agriculture. This insight has driven our choice to introduce these internationally proven products to the local market. As we continue to create demand at a grower level, we invite distribution, agronomists, and stakeholders to explore how our pioneering microbial solutions can transform their agricultural practices. By embracing these advanced biological technologies, growers can elevate their outcomes and navigate the complexities of modern agriculture with confidence.

As the landscape of agriculture shifts, the adoption of sustainable and innovative practices becomes essential. The launch of NEM's products symbolises hope and progress, offering the promise of a more resilient and fruitful future for agriculture.

For further information about our products and initiatives, please visit nem.com.au or call your local NEM Sales and Development Manager.

APVMA DECISION TO IMMEDIATELY CANCEL ALL PRODUCTS WITH CHLORTHAL DIMETHYL

The Australian Pesticides and Veterinary Medicines Authority (APVMA) has cancelled all 12 products containing the herbicide chlorthal dimethyl. This follows the recent United States Environmental Protection Agency (US EPA) emergency order to stop use of chlorthal dimethyl (DCPA), also known as Dacthal, in the US.

Chlorthal dimethyl is a herbicide used in vegetable crops, lawns and cotton that is currently in 12 products available in Australia.

APVMA Chief Executive Officer, Mr Scott Hansen, said the APVMA identified an immediate risk of serious injury or serious illness which could result from use of these products.

"The APVMA has the power to act swiftly where we identify an imminent risk to human health and we are exercising that authority today with the cancellation of all products containing chlorthal dimethyl," said Mr Hansen. "We haven't taken this decision lightly and are exercising a high degree of caution in cancelling these products and ask those who hold them to cease use immediately. We will issue information on the product recall requirements shortly."

Mr Hansen said this decision brings Australia into alignment with international counterparts and reiterated that there is no phase out period for the products due to the risk to human health.

"The APVMA considers the risk of continued use to be unacceptable as the risk of exposure cannot be effectively mitigated.

"The primary risk is to pregnant people's unborn babies, particularly where those people have handled the chemical or re-entered areas where the product has been used within the last 5 days. "We understand the impact that this regulatory decision will have on industry, but the safety of people is of paramount importance." Farmers and retailers may continue to hold product until further notice, but must not use it. The use of chlorthal dimethyl as an agricultural chemical product is now illegal.

Stakeholders with questions about the above decision may contact:

Australian Pesticides and
Veterinary Medicines Authority
GPO Box 572
Canberra ACT 2601
Australia

Email: enquiries@apvma.gov.au

Source: APVMA

Products cancelled:	
Product name	**Registration number**
Nufarm Chlorthal-Dimethyl 900 Herbicide	**59137**
Imtrade Pterodactyl 900 WG Pre-Emergence Herbicide	**65212**
KDPC Prethal 750WG Herbicide	**67445**
Novaguard Chlorthal 750 WG Herbicide	**68349**
Ezycrop Chlorthal 750 WG Herbicide	**69085**
Farmalinx Dynamo 750 Herbicide	**69626**
AC Discord 750 WG Herbicide	**69680**
MacPhersons Chlorthal 900 WG Herbicide	**81334**
Lawthal 750WG Herbicide	**83116**
Hemani Chlorthal 750 WG Herbicide	**85327**
Titan Chlorthal 900 WG Pre-Emergence Herbicide	**88705**
Dacthal 900 WG Pre-Emergence Herbicide	**93154**

NUTRIEN TRIPLES DOMESTIC MANUFACTURING CAPACITY

One of Australia's largest agricultural businesses has announced plans to expand its local manufacturing footprint to better serve Australian farmers and increase supply chain security.

Nutrien Ag Solutions has commenced work to establish a new plant nutrition, crop chemical and animal health manufacturing facility in Laverton, Victoria. The facility will have the capacity to produce critical farming inputs for growers on the east coast of Australia.

Nutrien Ag Solutions Managing Director Kelly Freeman said with increasingly volatile global supply chains, it made sense to expand the company's onshore manufacturing capability and inject more reliability in the local supply chain.

"As a company that imports products that are fundamental to growing food in Australia, we are always in the middle of someone else's supply chain. Over the past few years, geopolitical tensions, cost of energy and fuel, shifting global economies, longer shipping lead times, congestion at ports, extreme weather events and labor shortages have all contributed to an increasingly unpredictable supply chain," said Mr Freeman.

"Having the ability to manufacture significant volumes on both sides of the country is vital for us. That's why we've made the decision to invest in more manufacturing capacity on the east coast of Australia to give even more confidence to our farmers that they will have reliable access to all the key inputs they need to make the most of varying seasons and markets."

Nutrien Ag Solutions National Manufacturing Manager Cherine Kerbaj said the new Laverton site will triple Nutrien's domestic manufacturing capacity.

"We are expanding our manufacturing capacity to support the continued growth of our business and give us better balance between our east and west coast production assets. Transporting goods from our plant in Western Australia to east coast customers can be costly and complicated, so it makes sense to boost our capacity on the east coast as well," said Ms Kerbaj.

Nutrien Ag Solutions' current manufacturing portfolio includes a facility in Kwinana, Western Australia and a facility in Dandenong, Victoria. The new facility will be located at Laverton, Victoria.

"This is a great news story for farmers focused on more reliability, more flexibility and increased production of much needed agri-chemicals right here in Australia. The site will produce plant nutrition products and adjuvants, alongside crop chemical and animal health products," said Ms Kerbaj.

"Given we work in a rain-dependent industry, having more capacity on home soil also allows us to be flexible with our volumes in a far shorter timeframe so we can successfully meet the seasons' needs."

The fit out of the site is underway with the first line of products expected to commence at Laverton in 2025.

Tomato brown rugose fruit virus on mature fruit

ToBRFV on a tomato leaf

Necrotic spots of ToBRFV

Symptoms of ToBRFV on capsicum fruits and leaves

PLANT VIRUS DETECTION ILLUSTRATES CRITICAL IMPORTANCE OF BIOSECURITY

The recent discovery of tomato brown rugose fruit virus (ToBRFV) once again highlights the crucial role of biosecurity in defending both Australia's farming sector and sustainable food production against damaging insects, invasive weeds and diseases. Alone or combined, these pose a serious threat to the nation's agricultural productivity, sustainability, food security as well as our precious natural environment.

Tomato brown rugose fruit virus (ToBRFV) is a highly infectious plant virus that can affect tomato and capsicum production, reducing yields in affected crops by up to 70 per cent. Once a crop is infected, the only control action is destroying all affected plants.

"While there is no current organic or synthetic chemical or biological based product to neutralise this extremely damaging virus, growers should ensure the highest level of non-chemical management and prevention tactics are employed," said Matthew Cossey, Chief Executive Officer of CropLife Australia, the national peak industry organisation for the plant science sector.

"Knowledge is power: ensuring that famers and agronomist are familiar with potentially damaging pests, as well as their signs and symptoms is crucially important. Effective scouting and crop surveillance is critical in identifying and managing damaging crop pests. When properly identified, management options can then be tailored to the current specific situation or threat. Whether there exist effective plant protection options, paddock or facility quarantine, or the eradication of suitable hosts: the first stop is in positive identification.

"Proper management of alternate hosts and potential refuges for the pathogen is another tactic which can prevent the introduction of new pests. Always use seeds, cuttings, or other propagation material that has been tested and certified as free from pests and diseases. The entry and movement of crop pests can be prevented on-farm by ensuring your machinery, equipment and vehicles are regularly inspected, cleaned and disinfected.

"Biosecurity doesn't just happen at the border. Climate change will only intensify one of the most significant challenges to biosecurity and pest management that farmers will face in the coming decades. Growers, industry and the government all have a role to play in preventing the establishment of new and damaging pests in, Australia, be they insect, plant or – as in this case – pathogen. Which is why the plant science sector invests billions each year into the development of new cutting-edge crop protection products and genetically modified crops to give farmers the tools they need to manage protect their crops."

FOOD ORGANICS AND GARDEN ORGANICS (FOGO) POSITION PAPER UPDATED

AORA has recently reviewed and updated its "Food Organics and Garden Organics (FOGO) Position Paper" which is now available on the AORA website (www.aora.org.au).

This document has been prepared by AORA to provide a guidance framework for the key issues and considerations for the recycled organics industry throughout the transition from household Garden Organics collections to the mandated Food Organics and Garden Organics (FOGO) collections, and the delivery of Food Organics (FO) and FOGO collections for businesses by 2030.

As Australia continues to transition to a FOGO service across states, territories, and local government areas, it is vital that there is a clear understanding on what the service should be aiming to deliver, why and how. The value of a successful FOGO service is dependent on strong understanding and collaboration across the value chain and the delivery from the organics processing sector on a product of maximum quality to satisfy end-use markets.

AORA actively advocates for consistent policy and regulatory settings that promote the delivery of clean, source separated organic feedstock without plastics, chemicals and other contaminants to organics recycling facilities. AORA continues to advocate for the elimination of hazardous materials and contaminants from all feedstock streams, noting that this is one of the most significant threats to the future success of recycling and the circular economy.

However, our message on responsibility is also clear – the end of the supply chain is not where regulation of any contamination should occur but rather, elimination at the front end of the supply chain. Unless we responsibly and actively eliminate potential contaminants from use, they will remain a problem which cannot be resolved at organic processing facilities.

The key consideration from the AORA Food Organics and Garden Organics (FOGO) Position Paper are:

1. AORA and the recycled organics industry is committed to generating high-quality compost outputs that promote the protection of the environment and human health.
2. Minimising contamination in feedstock is critical to enable efficient and effective processing of organics into high quality end products.
3. AORA supports a national target of less than 2% contamination in source separated organics.
4. Consistent education and messaging across Industry, Councils and Government is vital to achieve behaviour change and support a sustainable Organics industry.

HOLY GUACAMOLE! AVOCADO TISSUE-CULTURE TECHNOLOGY TO HIT LATIN AMERICA

A TISSUE-CULTURE PROPAGATION TECHNOLOGY DEVELOPED AT THE UNIVERSITY OF QUEENSLAND TO GROW HUNDREDS OF PLANTS FROM A SINGLE CUTTING IS SET TO BOLSTER AVOCADO PRODUCTION ACROSS LATIN AMERICA TO MEET GROWING DEMAND.

A team led by Professor Neena Mitter at UQ's Queensland Alliance for Agriculture and Food Innovation developed the technology and it was licensed to the Chilean nursery Grupo Hijuelas by UniQuest, UQ's commercialisation company.

UQ's Dr Chris O'Brien said the technology would speed up the production of 4 key avocado rootstocks in the region.

"The propagation and tissue culture technology is a faster and cheaper way of producing clonal rootstocks, which have traditionally taken around 18 months to grow," he said.

"An avocado tree's rootstock influences its performance and using seedling rootstocks can lead to variable quality.

"This UQ technology means we can use clonal trees with the traits growers want, which means they can grow better crops."

Dr O'Brien said the team will travel to Chile to demonstrate the technology later this year with the aim to boost Zutano, Velvick, Reed and Kidd avocado rootstock production.

Grupo Hijuelas' CEO Juan Goycoolea said he was excited about the collaboration as the partnership promised to drive agricultural research and development across Latin America.

"We are working with cutting-edge technology that has shown excellent results in evaluation plots in Australia and we want to bring these benefits to our producers," he said.

Grupo Hijuelas has an international presence through its own nurseries and strategic partnerships in countries including Chile, Peru, Mexico, South Africa, Colombia, and also in Europe.

UniQuest CEO Dr Dean Moss said the UQ technology empowered avocado producers to quickly scale-up plant production with fantastic benefits to both farmers and consumers.

"It's no secret that South Americans are among the largest consumers of avocados in the world, as well as huge exporters to European markets," he said.

"This is a fantastic opportunity for exceptional UQ research to help build an agriculture pipeline of avocados that is efficient and plentiful in years to come."

The tissue-culture propagation technology was first licensed in Australia to Anderson Horticulture for Reed avocado rootstock in 2022.

The deal is the recipient of the 2024 UniQuest Commercialisation Impact Award.

The technology was developed as an outcome from research funded by the Australian Research Council with contributions from UQ, the Department of Agriculture and Fisheries, Anderson Horticulture, Jasper Farms, and Millwood Holdings.

Source: QAFFI

QAAFI's Dr Chris O'Brien

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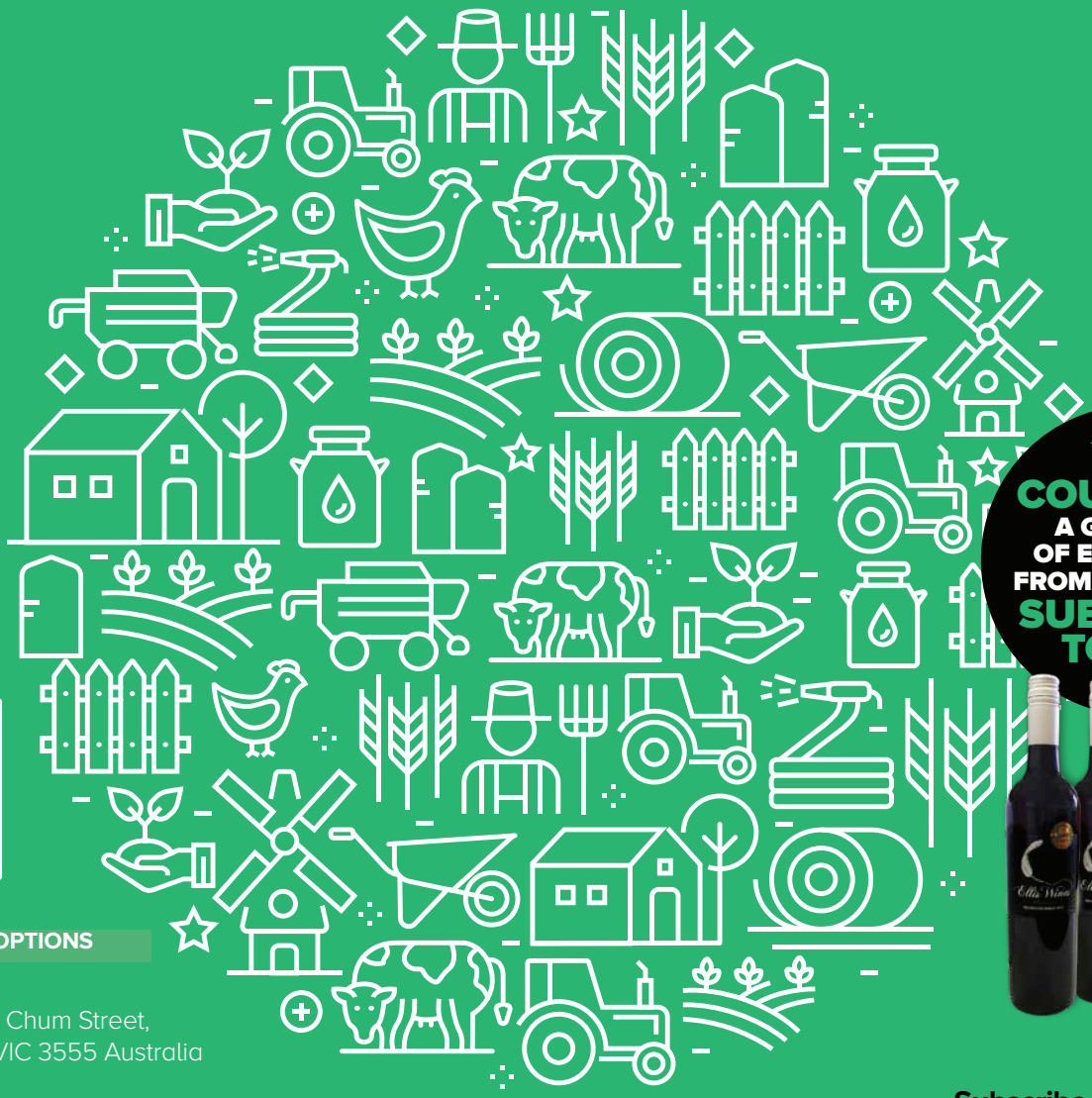

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COLESWORTH UNDER FIRE

COLES AND WOOLWORTHS HAVE BEEN SUBPOENAED TO PROVIDE EVIDENCE AT THIS WEEK'S ACCC HEARINGS AS PART OF THEIR INQUIRY INTO SUPERMARKET PRACTICES.

The NFF Horticulture Council is urging the ACCC to focus closely on these supermarkets' actual buying practices and procedures. "We have long maintained that these buying practices are exploitative and take advantage of growers due to the perishable nature of their product," said Jolyon Burnett, chair of the Council.

"Horticulture is a sector that provides 98 per cent of Australia's fresh fruit and vegetables and underpins our national food security.

"Woolworths and Coles understand that growers have little choice but to sell to them due to their dominant market position—one of the largest retail duopolies in the developed world—and because their produce is perishable.

"Growers often have no option but to sell or risk their produce becoming worthless. As described by the ACCC, growers are vulnerable to "take-it-or-leave-it terms from buyers, or exploitative conduct".

"There are almost no long-term contracts with the major supermarkets; instead, they prefer to buy every week, pitting desperate growers against one another. This practice has persisted for decades.

"Growers report that they haven't received price increases for 15 years, while over the same period, the major supermarkets have continued to post record profits."

Analysis of a major supermarket's share price and dividends showed that over the last 25 years, it has delivered a massive 13% per annum return to shareholders. In contrast, superannuation funds over the same period have returned just 7.3%.

"For growers, such returns are a distant dream. Given the billion-dollar profits regularly recorded by supermarkets, it would be reasonable to expect their main suppliers—the farmers—to share in some of this growth," said Mr Burnett.

"Unfortunately, this hasn't happened. Instead, farmers' productivity gains over this period appear to have been gobbled up by the supermarkets, representing a generational wealth shift from farmers to a select group of senior executives and shareholders.

"The NFF Horticulture Council is calling on the government to stand ready to respond to outcomes of the ACCC inquiry and take decisive action on supermarkets to ensure fair outcomes for both growers and consumers.

"This could include an immediate cap on further market share growth, including all forms of vertical or horizontal integration. The supermarkets are big enough already."

About the Horticulture Council

The Council is the recognised peak body for forming policy and advocating on behalf of the national horticulture industry. Established in 2017, it now comprises 21 national commodity and state-based horticulture bodies.

It is a member of the National Farmers' Federation, free to establish and advance its own policy positions and responses issues impacting the horticulture industry.

Source: National Farmers Federation (NFF)

Seasol Plus Potassium

TECHNICAL INFORMATION

OVERVIEW

Seasol Plus Potassium is formulated to protect plants from damage caused by biotic and abiotic events that could impact fertility, and overall plant yield. In frost events especially, Seasol Plus Potassium can increase accumulation of soluble sugars, which play an essential role in stabilising various biological components such as the cellular membrane and membrane-bound organelles. By stabilising these components, Seasol Plus Potassium can minimise electrolyte leakage and limit the effects of frost damage.

Seasol Liquid Seaweed Extract

Potassium

ABOUT SEASOL PLUS POTASSIUM

Seasol Plus Potassium improves frost tolerance in plants through biochemical, molecular, and physiological changes. Seasol Plus Potassium reduces frost-induced electrolyte leakage by maintaining membrane integrity during freezing stress.

Seasol Plus Potassium helps regulate sugar and acids in plants. Sugar accumulation helps plants to reduce frost stress by playing an essential role in stabilising various biological components such as the cellular membrane and membrane-bound organelles.

FEATURES AND BENEFITS

- Aids plant establishment and reduces transplant shock
- Stimulates root growth and enhances flowering
- Increases tolerance to adverse environmental conditions
- Enhances soil microbial activity

TYPICAL ANALYSIS

W/V: Nitrogen (N) 0.1%. Phosphorus (P) 2.9%. Potassium (K) 10.8%

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