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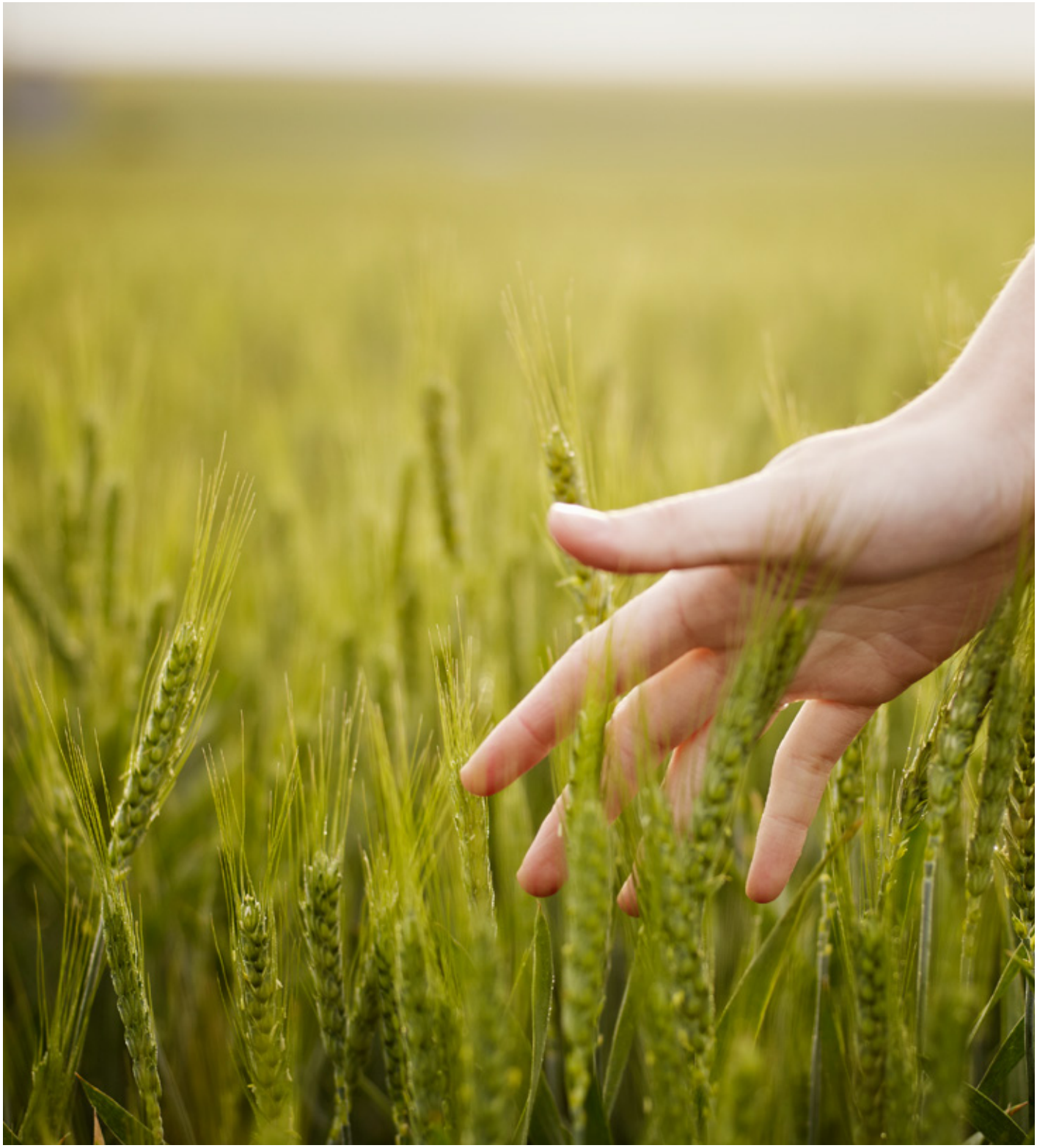

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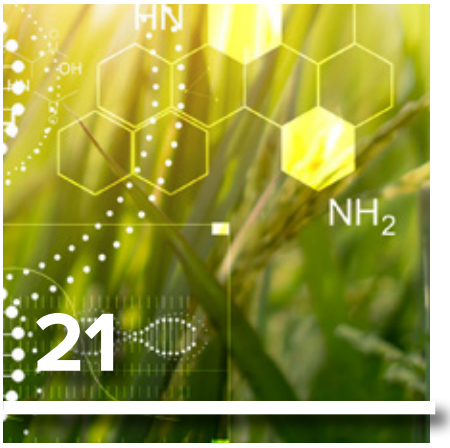

A NEW DAWN IN PLANT BREEDING: AUSTRALIAN PLANT BREEDING ACADEMY

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CITRUS AUSTRALIA'S EXPORT STRATEGY RECEIVES $485,711 BOOST TO EXPAND IN INDIA

Citrus Australia will use a $485,711 grant from the Federal Government to increase export opportunities to India for Australian growers, through targeted development of the Indian market.

The Australian citrus industry currently exports up to $540 million worth of citrus around the world and India and the sub-continent have been recognized as potential growth markets.

India has a population of 1.3 billon people, with 24 percent classified as middle-income or higher.

Citrus Australia CEO Nathan Hancock said there are considerable challenges to increasing exports to India so dedicated resources are required to gain a better understanding of the market and build and maintain relationships.

"We look forward to developing long term relations with business leaders and government in India, it's a country with such a rich culture and a vibrancy and we see great opportunities for mutual benefit for traders in both countries and the end consumer."

"We thank the Commonwealth Government for realizing the potential of this market and our strategic plan by providing this funding," Mr Hancock said.

"Work conducted by Citrus Australia through this project over the next two years will put the foundations in place to grow exports of class-1 Australian citrus to as much as 30,000 tonnes by 2030."

Minister for Agriculture and Northern Australia David Littleproud said the Citrus Australia project would help Australia growers to target high value niche markets in India.

"This Agricultural Trade and Market Access Cooperation (ATMAC) grant to Citrus Australia is a great help for our citrus growers to diversify their market and grow their businesses," Minister Littleproud said.

"The past 2 years have been marred by market disruptions and global freight and logistics challenges, and India and the subcontinent present real growth prospects for our high-quality, sustainable Aussie citrus."

Under the project, Citrus Australia aims to develop a market for class-1 fruit, including navel oranges, and Afourer and Murcott mandarins, seeking to develop premium returns to Australian growers.

It will achieve this through conducting detailed research into the India market, increased engagement with those along the Indian supply chain, dedicating additional resources to build relationships and capability, and conducting study tours and inward trade missions with Australian citrus businesses.

"The Australian citrus industry has grown its export program through the reputation of our safe, quality fruit, recognized as the best in the world," Mr Hancock said.

"This project will enable us to increase our knowledge on how to deliver this fruit to the rising higher-income demographic of India and build the resources and relationships to do so long-term."

Citrus Australia has appointed Claire Fitchett as a Market Development Manager to lead the project.

In the last decade, Claire has worked for Apple and Pear Australia Ltd as market development manager before moving to Australia's largest pome and stone fruit marketer (Montague) as International Strategy Manager.

"We take great pleasure in welcoming Claire to the Citrus Australia team, she's an asset to industry who will hit the ground running," Mr Hancock said.

For further information, contact Stephen Cooke, Industry Engagement Manager, Citrus Australia.

E: stephen.cooke@citrusaustralia.com.au

FARM SAFETY WEEK

PROTECTING OUR FARMERS COMES FIRST

While productivity growth is an essential element of Australian agriculture's international competitiveness, investing in health and safety on-farm is the most crucial input of all.

Chief Executive Officer of CropLife Australia, the national peak industry organisation for the plant science sector, Mr Matthew Cossey, said, "Farm Safety Week is a reminder that there's never a good time or place to cut corners with safety. Especially as fatigue, familiarity and complacency begin to arise from long hours at work in field and on farm.

Australian farmers are producing more food for more people with fewer resources than ever before. While it might come at the expense of time and labour, it should never come at the expense of health and safety. Crop Life

The plant science industry invests billions of dollars in R&D every year which includes safe use practices of all products. This is why strict adherence to label conditions when using and applying pesticides is a nonnegotiable measure for managing risk. Personal protective clothing like impervious aprons, gloves, goggles and chemical proof protective footwear and respirators should always be worn when mixing or applying pesticides.

"CropLife's suite of stewardship initiatives, StewardshipFirst, is another resource for farmers, applicators and agronomists to support farm safety. CropLife's wholly owned subsidiary Agsafe also provides best practice training. This ensures that anyone who stores, handles transports or provides advice on agricultural chemicals understands how to effectively manage and mitigate any possible risks," said Mr. Cossey.

Agsafe also manages important recycling and disposal initiatives. The drumMUSTER® program has safely disposed of and recycled over 39,000,000 chemical drums since its inception 25 years ago, while ChemClear® ensures expired, unwanted, or unknown pesticides are safely and properly disposed of.

"Safety should never be an optional extra, rather the foundation of all decisions. Our farmers need to make a commitment to invest in themselves, with the knowledge that the plant science sector will always be behind them," Mr Cossey concluded.

"Australian farmers are producing more food for more people with fewer resources than ever before. While it might come at the expense of time and labour, it should never come at the expense of health and safety."

Mr Matthew Cossey, CEO Crop Life

REDUCING THE IMPACT OF SERPENTINE LEAFMINER IN AUSTRALIAN HORTICULTURAL CROPS

NSW Department of Primary Industries (DPI) has partnered with Hort Innovation through the Hort Frontiers strategic initiative to investigate the sustainable control of the invasive Australian serpentine leafminer (Liriomyza huidobrensis).

Led by NSW DPI plant biosecurity researcher Duong Nguyen, the project aims to effectively manage the serpentine leafminer, which was first detected in NSW in 2020 and is now considered endemic.

Dr Nguyen and her team from the Insecticide Resistance Unit at the Elizabeth Macarthur Agricultural Institute (EMAI) are exploring improved chemical control and resistance management based on sound science.

The project will develop and deliver cost effective and accurate insecticide resistance surveillance tools and management strategies for serpentine leafminer in Australia by:

• Establishing field collected serpentine leafminer strains at EMAI

• Developing bioassay methodology to detect insecticide resistance in serpentine leafminer

• Genomic sequencing of Australian serpentine

LEAFMINER

• Using the genomic sequencing to underpin the

potential detection of insecticide resistance target sites that will be investigated via massive parallel sequencing so producing a DNA-based resistance detection capability, and

• Field trials to verify potentials chemicals identified via bioassay and deliver extension support.

The project, AS20002-Insecticide resistance in serpentine leafminer, funded by the Hort Frontiers Advanced Production Systems Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment NSW DPI and contributions from the Australian Government is due to finish in June 2024.

BACKGROUND

Serpentine leafminer is native to central and south America and spread rapidly in the 1980s to become a global pest on all continents. Introduced to Australia in 2020, it was first detected in NSW and later Queensland.

It has the potential to damage multiple crops including vegetables, melons, and nursery stock. It is difficult to control as larvae are hidden in leaf tissue and pupate in the surrounding soil.

Chemical controls are limited with inappropriate sprays further reducing the effectiveness of biological control. Insecticide resistance for serpentine leafminer in Australia is completely unknown. The use of broad- spectrum pesticides to control other insect species may potentially affect leafminer control and resistance development.

Outside Australia, serpentine leafminer is known to be resistant to organophosphate and pyrethroid insecticides with the related species, American serpentine leafminer, also resistant to cyromazine, avermectin and spinosyn.

Nowhere in the world is there any information on the genetic basis of insecticide resistance in serpentine leafminer. This currently makes the use of DNA methods for resistance detection and management problematic.

EXPECTED OUTCOME

This project will develop a sustainable chemical control strategy, including an insecticide resistance detection capability by bioassay and DNA-based insecticide resistance diagnostic tools to reduce the impact of serpentine leafminer in Australian horticultural crops.

The expected outcomes of this project will contribute significantly to strategy 2, outcome 2 of the Melon Strategic Investment Plan 2022-2026.

Dr Duong Nguyen

NSW Department of Primary Industries

DETECTING AND MANAGING TRACE ELEMENT DEFICIENCIES IN CROPS

Author: Nigel Wilhelm Grains Research & Development Corporation and Sjaan Davey (SARDI, Waite Research Precinct, Adelaide)

Background

Many soils in the cropping zone of southern Australia are deficient in trace elements in their native condition. Despite many decades of research into trace element management, crops can still be found to be deficient in one or more of these trace elements. Just because trace element deficiencies have not been prevalent in recent years, does not mean they will not return. There is increasing concern in some districts that trace element deficiencies may be the next nutritional barrier to improving productivity. This is because current cropping systems are exporting more nutrients to the grain terminal than ever before.

Why is there a need for trace elements?

Essential trace elements are nutrients which are required by plants and animals to survive, grow, and reproduce but are needed in only minute amounts. Southern Australian cropping soils are more likely to be deficient in zinc (Zn), copper (Cu), and manganese (Mn) than the other trace elements. Of these three, Zn deficiency is probably the most important because it occurs over the widest area. Zn deficiency can severely limit annual pasture legume production and reduce cereal grain yields by up to 30 per cent. Cu deficiency is also important because it is capable of causing total crop failure. If these three trace elements are not managed well the productivity of crops and pastures can suffer valuable losses, and further production can also be lost through secondary effects such as increased disease damage and susceptibility to frost.

Adequate trace element nutrition is just as important for vigorous and profitable crops and pastures as adequate major element (such as nitrogen or phosphorus) nutrition.

ZINC DEFICIENCY

Zn deficiency has been identified on many soil types. Acid sandy soils, sandy duplex soils, red-brown earths, 'mallee' soils, calcareous grey soils, and red heavy soils have all had either Zn responses confirmed or crops have been identified with Zn deficiency symptoms. Zn deficiency appears to be equally severe in both high and low rainfall areas.

Symptoms

It is very difficult to diagnose Zn deficiency in pasture or grain legumes because the characteristic Zn deficient leaf markings are rarely produced in the field. Zn deficiency causes shortening of stems and the leaves fail to expand fully. This results in plants which appear healthy but are stunted and have small leaves. In cereals, symptoms are usually seen on seedlings early in the growing season. An early symptom of Zn deficiency is a longitudinal pale green stripe on one or both sides of the mid-vein of young leaves (Figure 1). The leaf tissue in this stripe soon dies and the necrotic area turns a pale brown colour. Severely affected plants have a 'diesel-soaked' appearance due to the necrotic areas on the leaves, which generally start mid-way down the leaf, causing the leaf to bend or break in the middle.

Plant symptoms appear to be worst early in the season when conditions are cold and wet and light intensity is low. In spring, symptoms often do not appear on new leaves but grain yields will usually be reduced

Figure 1: Zinc deficiency symptoms as seen in wheat.

Diagnosis

Plant tests for diagnosing Zn deficiency are reliable and have been calibrated in the field under Australian conditions for wheat, barley, medic, beans, and peas. In tillering plants of wheat and barley, YEB (youngest fully emerged blades) levels above 20-24mg/kg are considered adequate. The minimum value in YOLs (youngest fully open leaves) of medic is 15mg/kg and in beans and peas the figure is approximately 23mg/kg (although our information on peas is very limited). For lucerne, levels above about 20mg/kg in young shoots appear to be adequate.

Correction

Correction of Zn deficiency in a way which provides benefits after the year of treatment is possible through the use of Zn-enriched fertilisers or a pre-sowing spray of Zn onto the soil (incorporated with subsequent cultivations). There is also the option of a Zn-coated urea product which can be used to supply

Zn to the crop, and is most useful when pre-drilling urea before the crop. Another option that will also provide long term benefits but has become available only recently is the application of fluid zinc at seeding. The advantage of this approach is that it will provide residual benefits for subsequent crops and pastures and has a low up-front application cost (providing you ignore the capital investment in a fluid delivery system!). At current prices, a typical application may cost about $6.00/ha (this is 1kg of Zn/ha). Only Zn-enriched fertilisers of the homogenous type (fertiliser manufactured so that all granules contain some Zn) are effective at correcting Zn deficiency in the first year of application. A rate of two kilograms of elemental Zn per hectare applied to the soil is necessary to overcome a severe Zn deficiency and should persist for three to ten years (depending on soil type). Short intervals between repeat applications of Zn will be necessary on heavy and calcareous soils in the high rainfall areas, while seven to ten year intervals will be acceptable in the low rainfall areas. Following an initial soil application of 2kg Zn /ha repeat applications of 1 kg/ha will probably be sufficient to avoid the reappearance of Zn deficiency in crops and pastures. Most zinc-enriched fertilisers are now not sold as pure homogeneous types, but providing a homogeneous fertiliser is used as part of the mix then the final product is still satisfactory for correcting Zn deficiency. For example, the company may produce a diammonium phosphate (DAP) Zn five per cent 'parent' product which has Zn on every granule which they will then blend with straight DAP to give 1 and 2.5 per cent products for the retail market. This option will currently cost approximately $17.00/ha. Zn deficiency can be corrected in the year that it is recognised with a foliar spray of 250-350g Zn/ha but it has no residual benefits and is therefore not the best approach for a long-term solution. This option will currently cost approximately $1.00/ha (plus the cost of the operation). Zinc can be mixed with many herbicides and pesticides but not all, so check with your supplier for compatible tank mixes before you make the brew. Recent trials in eastern Australia suggest that chelated sources of trace elements are no more effective at correcting a deficiency than their sulphate cousin (see Figure 2 for an example of treating copper deficiency in wheat), although older results from WA showed that there are situations where they can be superior. Seed dressings of zinc are another option for managing Zn deficiency. These products are effective and will supply Zn to the young crop but they will not completely overcome a severe deficiency. Nor will they increase soil reserves of Zn. Seed with high internal levels of Zn can also be used in a similar way. However, both approaches should be used in conjunction with soil applications to correct and manage Zn deficiency in the long term. This option will currently cost approximately $3.00/ha.

COPPER DEFICIENCY

Symptoms

Apart from shrunken heads in cereals, heads with gaps in them, or 'frosted' heads, Cu deficiency rarely produces symptoms in plants in the field. The symptoms produced by Cu deficiency in the maturing cereal plant are due to poor seed set from sterile pollen and delayed maturity. However, under conditions of severe Cu deficiency cereal plants may have leaves which die back from the tip and twist into curls. Cereal stubble from Cu-deficient plants has a dull grey hue and is prone to lodging due to weak stems. Cu-deficient pasture legumes are pale, have an erect growth habit, and the leaves tend to remain cupped (as if the plant were suffering from moisture stress).

Diagnosis

Leaf analysis to detect Cu deficiency in plants is a very important management tool because Cu deficiency can produce devastating losses in grain yield of crops and pastures with little evidence of characteristic symptoms. Cu concentrations in YEBs of cereals above 3mg/kg are considered adequate and below 1.5mg/kg deficient. Pasture legumes, including lucerne, have higher requirements for Cu and plants are considered deficient if YOL values are below 4.5mg/kg. Lupins are tolerant of Cu deficiency and levels above 1.2mg/kg are adequate. Cu deficiency in livestock (steely wool in sheep; sway-back in lambs; rough, pale coats and ill-thrift in young cattle) is a continuing problem in some areas because livestock have a higher requirement for Cu than pasture plants. The low availability of Cu in the diet can be induced by high Mo intake which can be further exacerbated by high sulphur (S) levels. The introduction of Cu bullets which provide protection for 12 months has made treatment of the problem simple and cost-effective.

Correction

Traditionally, Cu deficiency has been corrected by applying Cu-enriched fertilisers and incorporating them into the soil. Most soils require 2kg/ha of Cu to fully correct a deficiency, and this application may be effective for many years. Due to the excellent residual benefits of soil-applied Cu, Cu deficiency in crops and pastures has been largely overcome in most areas from the use of the 'blue stone' mixes in the 1950s and 1960s.

However, Cu deficiency may be re-surfacing as a problem due to a number of reasons:

- The applications of Cu made 20-40 years ago may be running out
- The use of nitrogen fertilisers is increasing and they will increase the severity of Cu deficiency
- Cu deficiency is affected by seasonal conditions and farming practices (e.g. lupins in a lupin/wheat rotation make Cu deficiency worse in succeeding wheat crops).

Application of Cu by Cu-enriched fertilisers will currently cost approximately $19.00/ha. Cu deficiency in crops can also be corrected by fluid application at seeding with an application cost as low as $4.60/ha. Performance of soil applied Cu will improve with increased soil disturbance. Although Cu deficiency is best corrected with soil applications, foliar sprays will also overcome the problem in the short term. A foliar spray of Cu (75-100 g/ha of Cu) is very cheap (approximately 90c/ha for the ingredient) but a second spray immediately prior to pollen formation may be necessary in severe situations. This was the case in a trial conducted on lower Eyre Peninsula in 2015, where a late foliar spray was necessary to completely eliminate Cu deficiency in an area that was extremely deficient for Cu and where the problem was exacerbated by a dry spring when wheat was forming pollen and setting grains (Figure 2). ...*Continued on Page 12*

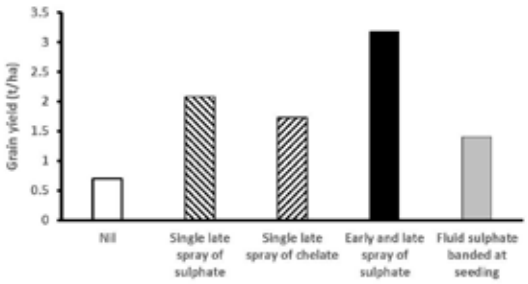

Figure 2: Effectiveness of four application strategies for treating Cu deficiency in wheat. Foliar sprays were applied at 90g Cu/ha, the fluid at seeding at 1kg Cu/ha. Trial at Cummins, lower Eyre Peninsula, 2015.

...Continued from Page 11

MANGANESE DEFICIENCY

The availability of Mn in soil is strongly related to soil pH. Soils with higher pH have lower Mn availability than soils with lower pH. Mn deficiency is therefore more likely to be a problem on alkaline soils. However, responses to Mn have also been recorded on impoverished, acid to neutral sandy soils. The availability of Mn is also strongly affected by seasonal conditions and the availability is lowest during a dry spring. Transient Mn deficiency may also appear during cold, wet conditions but affected plants are often seen to recover following rains in spring when soil temperatures are high.

Symptoms

Mn is poorly translocated within the plant so symptoms first appear in young leaves. Old leaves on plants severely affected by Mn deficiency can still be dark green and healthy because they acquired Mn from the seed and once Mn enters a leaf it cannot be shifted out. Mn deficiency results in plants which are weak, floppy, and pale green/yellow in appearance. Mn-deficient crops can appear to be water-stressed due to their sagging appearance. Close examination of affected plants can reveal slight interveinal chlorosis; where the distinction between green veins and 'yellow' interveinal areas is poor. In oats Mn deficiency produces a condition known as 'grey speck'. Mn-deficient oats are pale green and young leaves have spots or lesions of grey/brown necrotic tissue with orange margins (this contrasts with Septoria lesions which have purple/red margins). These lesions will coalesce under severely Mn-deficient conditions. Mn deficiency delays plant maturity, which is a condition most marked in lupins. Mn-deficient patches in lupins will continue to remain green months after the rest of the paddock is ready for harvest. Delayed maturity in patches of the crop is frequently the only visual symptom of Mn deficiency in lupins. Mn deficiency will also cause seed deformities in grain legumes. Lupins suffer from 'split-seed' which is caused by the embryo breaking through a very weak seed coat. 'Split-seed' will reduce yields and also viability of the harvested grain. A similar condition in peas is known as 'marsh spot' due to a diffuse dark grey area within the seed.

Diagnosis

Plant analysis will accurately diagnose Mn deficiency in crops and pastures at the time of sampling but Mn availability in the soil can change dramatically with a change in the weather condition. This means that the Mn status of the sampled crop or pasture can also change dramatically after sampling which must be allowed for when making recommendations on Mn deficiency. Concentrations of Mn in YEBs greater than 15mg/kg are considered adequate for cereals at tillering. For legumes, the corresponding figure in YOLs is 20mg/kg. The Western Australia Department of Agriculture also advocates a main stem analysis of lupins for diagnosing Mn deficiency at flowering.

Correction

Due to the detrimental effect of high soil pH on Mn availability, correction of severe Mn deficiency on highly calcareous soils can require the use of Mn-enriched fertilisers banded with the seed (three to five kg Mn/ha) as well as one to two follow up foliar sprays (1.1kg Mn/ha). In the current economic climate growers on Mn-deficient country have tended not to use Mn-enriched fertilisers (due to their cost) but have relied solely on a foliar spray. This is probably not the best or most reliable strategy for long term management of the problem. Neither soil nor foliar Mn applications have any residual benefits and must be re-applied every year. Another approach is the coating of seed with Mn. This technique is cheap and will probably be the most effective in conjunction with foliar sprays and/or Mn enriched fertilisers. Mn deficiency in lupins must be treated with a foliar spray at mid-flowering on the primary laterals. The use of acid fertilisers (e.g. nitrogen in the ammonium form) may also partially correct Mn deficiency on highly alkaline soils but will not overcome a severe deficiency. Mn deficiency in crops can also be corrected by fluid application at seeding.

Final note

There are other trace element deficiencies which can occur in crops and pastures (e.g. boron, molybdenum, iron, etc). Deficiencies in these trace elements, however, are likely to be localised or not at all in many districts and therefore discussion wasn't included in this paper.

If you do, however, require any information on these please contact the author at **nigel.wilhelm@sa.gov.au.**

Conclusion

Trace elements are as essential to productive and profitable crops as nitrogen and phosphorus. The difference is that crops only require them in minute amounts. Zinc, manganese, or copper deficiencies are the most common and severe problems. Trace element deficiencies are difficult to diagnose with soil tests or from plant symptoms. Plant testing is the most reliable, if not fool proof tool to diagnose trace element deficiencies. Foliar sprays will usually correct a problem in crop. However, for long term correction of the deficiency boosting soil reserves is a sound investment.

Acknowledgement

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SOURCE: https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2016/02/detecting-and-managing-trace-element-deficiencies-in-crops

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Applied post-harvest or ahead of planting at a rate of 1.2L/ha, the product has led to higher yields and higher income from subsequent crops.

Trials were conducted in 2021 across a variety of Australian field-crop stubbles including sorghum, wheat, barley and legumes, followed by horticultural crops, cotton, wheat, barley, and legumes.

WHEAT TRIAL, QUEENSLAND

At Evanslea on Queensland's Darling Downs west of Toowoomba, Res+ was applied to mungbean stubble 10 days before an early-July planting of Sunchaser wheat.

Wheat planted into the treated area was noticeably greener, due to increased organic nitrogen from quicker conversion of mungbean residue to plant-available nutrients.

Harvested late October, areas of the paddock treated with Res+ yielded an extra 0.24 tonnes/ha, worth $115.20/ha at feed-grade wheat prices.

WHEAT TRIAL, WA

A two-year study in 2020-2021at Katanning in WA showed 7 percent year-on-year yield benefits from applying Res+ to Sceptre wheat residues prior to planting the next wheat crop.

The researchers concluded that as well as benefitting yield, Res+ was easily integrated into the farming system without major changes.

CANOLA TRIAL, VICTORIA

At Lara in Victoria, applying Res+ to barley stubble increased yield of the following canola crop by 15 percent (0.28 tonnes/ha) compared with sections receiving the farmer's standard treatment. That extra yield was worth $283/ha at $1000/tonne for canola.

BROCCOLI TRIAL, QUEENSLAND

On Queensland's southern Darling Downs, using Res+ on forage sorghum stubble at Clifton increased yield of the following broccoli crop by 15.5pc, with increased head weight of 67 grams/head and improved broccoli-head quality estimated to be worth $5,401/ha (at $2.37/kg).

On the Res+ treated portion, the soil was much easier to work and plant the broccoli crop in August, and the October-picked crop was ready for harvest a week earlier than the untreated area.

Elemental Enzymes Australia sales and marketing manager Chris Ramsey said Res+ had now proved its worth in a wide range of Australian crops, in corn trials across USA and Europe, and was easily integrated into existing farming operations.

HOW DOES RES+ WORK?

Res+ was developed by US life-sciences company Elemental Enzymes to accelerate crop residue degradation after harvest – allowing quick return of key nutrients to the soil and enhancing microbial activity, soil health and planting conditions for the following crop.

Mr Ramsey said Res+ contained many key factors needed by soil microbes to grow and spread on residues, providing growers with a simple way to optimise and speed up microbial attack of residues and release of nutrients.

"Native soil microbes produce enzymes to break down plant residues into smaller particles that they can digest. The process is complex, but keys to efficient breakdown are temperature, moisture, the presence of essential nutrients, and the ability of microbes to access the carbon trapped in residues.

"Warmer temperatures stimulate greater microbial growth and quicker degradation, and Res+ provides several of the other key ingredients – prolonged stubble moisture, micronutrients, nitrogen, and plant-cell-wall degrading enzymes."

Microbes require moisture to move through the soil to colonise stubble, and to allow direct contact between their excreted enzymes and crop residue to break down and release nutrients. The humectant in Res+ attracts water to the residue and holds it there, facilitating microbial activity.

Mr Ramsey said carbon and nitrogen in residues were major nutrients for these microbes, but they also needed micronutrients including magnesium, boron, copper, manganese, molybdenum and zinc, which Res+ provides in available chelated forms.

"Crop residue is predominantly carbon, in cellulose, hemicellulose and lignin which provide the plant's rigidity and makes stubble resistant to degradation. Res+ contains a patented plant-cell-wall-degrading enzyme to break down cell walls – providing microbes with quick access to the preferred carbon nutrient, glucose inside cells, and also causing quicker structural collapse of residues.

"Res+ also contains 6% available N, which studies have shown increases structural breakdown by lignin-degrading microbes."

USING RES+

He said applying Res+ provided a uniform, high concentration of essential stubble-degrading enzymes, key supporting nutrients, and moisture-attractant throughout the soil and right across the paddock – leading to faster, more consistent degradation of residues by microbes.

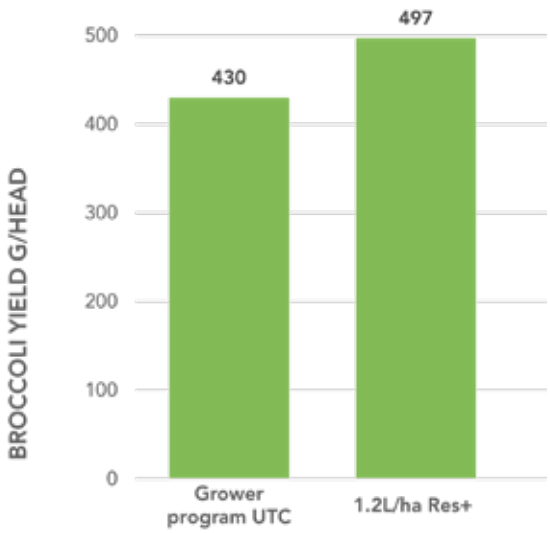
"The enzymes start work immediately and continue for several weeks, providing a nutrient-rich and friable area around seeds and young plants.

"As soil temperatures rise and growers plant summer crops into winter-crop stubble, Res+ will improve paddock workability and speed up cycling of locked-up nutrients.

"Another of the company's enzyme products Lumen, applied with fertiliser at planting, will continue converting residual organic material, and improve young plant growth with increased available N,P and K."

Res+ is formulated in Australia and available in 20L and 1,000L packs, and can be applied with post and pre-emergent herbicides, pesticides and liquid fertilisers (check the Res+ label for more detail on compatibility). Res+ is one of several innovative products being trialled and introduced to Australian agriculture and horticulture by Elemental Enzymes.

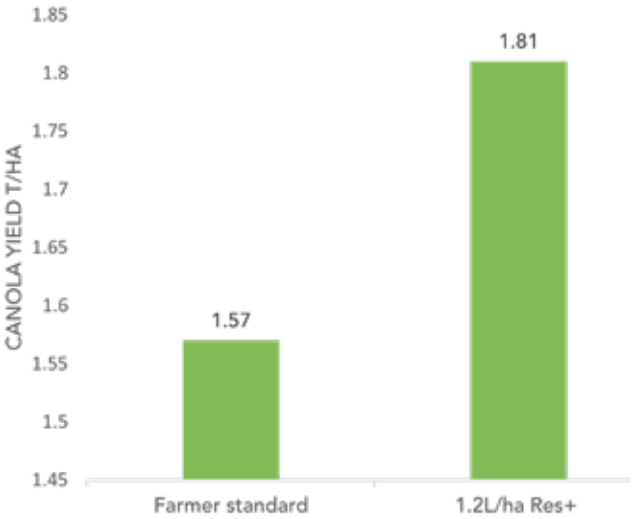
BROCCOLI TRIAL, CLIFTON QUEENSLAND



At Clifton in southern Queensland, as well as a broccoli yield improvement of 15.5pc from the Res+ treated portion of the paddock, the soil was much easier to work and plant broccoli, with the crop ready for harvest a week earlier than untreated areas.

USING Res+ on forage sorghum stubble at Clifton, Queensland increased yield of the following broccoli crop by 15.5pc, worth $5,401/ha.

WHEAT TRIAL, KATANNING, WA



As well as a 7 percent year-on-year yield benefit, a 2-year trial at Katanning in WA showed Res+ was easily integrated into the farming system without major changes.

BARLEY TRIAL, LARA VICTORIA

At Lara in Victoria, applying Res+ to barley stubble increased yield of the following canola crop by 15 percent.

SOIL HEALTH BENEFITS WITH NEW SALIBRO® NEMATICIDE

The ability to move away from soil fumigants towards a more sustainable option to control nematodes has been welcomed by Daniel Hoffmann, who grows a wide range of vegetable crops at Penfield, South Australia.

Mr Hoffmann said their protected cropping enterprise had been operating for more than 30 years, growing tomatoes capsicum, eggplant, cucumber and zucchini.

“Nematodes are one of our biggest issues,” he said. For longer crops like capsicums it's always going to be a big problem. They will just take over and you end up without any fruit at all. You are going to get one third of the yields that you would normally get.”

He said in the past, the only real option to control nematodes was to fumigate the soil which controlled the pest but caused other issues.

“It's very costly to keep fumigating and keep destroying your soil and then try to bring the biology back. It just gets worse and worse every year. I put soil fumigation up there with chemotherapy for people. It basically just destroys everything.”

Daniel Hoffmann, from Penfield, SA, said Salibro® nematicide controlled Root-knot nematodes while leaving soil biology in the soil.

Late in 2021 Mr Hoffmann, who also works for SA company, Grower Supplies, participated in a tomato trial on the property comparing the new Salibro® nematicide to a range of industry standards.

“I’m happy to be involved in trials. I want to see the new stuff come through.”

The area was chosen because it was heavily infested with nematodes, with the previous crop yielding about 50 per cent of its potential.

Salibro® was applied at the label rate and areas of the rows were left untreated as a comparison. Other industry standards were also included in the trial and the remainder of the crop was treated with the fumigant, Metham.

"Early on, at 30 to 35 days after planting, the Salibro® is stacking up really nicely against the Metham,” Mr Hoffmann said. “The areas that are untreated are almost finished. We’re not going to pick anything from them. “Where the other products have been put in, Salibro has definitely done better. So far, it's looking really good." He said the healthier plants in the Salibro® treated area would lead to higher yields at the end of the season.

“The Salibro® will get to about eight trusses, before we start picking, just because it's a happy plant. Where the untreated area is, with the high nematode numbers and the stress, you're probably going to get to about four trusses before you start seeing the fruit colour up.

He said they would advise growers to be wetting up a wider area when using Salibro® to allow the product to move further into the root zone.

“You want to get as big a bubble of the wetted area as you can and at least four or five hours before putting the Salibro® in.

“When you apply the Salibro with another big watering, it should go and fill up that whole area. You'd want to be treating the area where the entire root system is going to go as a mature plant so you're pushing the nematodes right out and then letting the new roots grow into that clean zone."

Mr Hoffmann said the initial results from Salibro® had been very encouraging in its ability to control nematodes while keeping key beneficial organisms in the soil.

“Definitely one of the bestselling points for me for Salibro® was the fact that it's going to keep your soil biology intact and it's really only going to target that Root Knot nematode,” he said.

“The hardest thing with fumigation is knocking everything out and then you have to spend a fortune putting micros back in. “Trying to grow those beneficial fungi and trying to get the carnivorous nematodes to come back in. If you’re only knocking out the bad guys, you let the good guys build up.”

“After a few seasons, your soil is going to be better and you're probably not going to need that fumigation every year. It's definitely looking promising," Mr Hoffmann said.

Salibro® treated tomato plants showing minimal nematode damage (left) compared to the untreated control at a trial in Penfield, SA.

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NEW STRUCTURE ANNOUNCED TO ACCELERATE RICE BREEDING IN AUSTRALIA

A new entity Rice Breeding Australia (Ltd) has been established to drive development of new varieties for the Australian rice industry, with an increased focus on water productivity improvements and acceleration of rates of genetic gain in rice breeding in Australia. A joint venture between AgriFutures Australia, the SunRice Group and the Ricegrowers' Association of Australia (RGA), Rice Breeding Australia aims to drive rice breeding into the future.

The Australian rice industry has recently mapped a pathway for its future with the launch of the Rice Program Strategic Research, Development and Extension Plan (2021- 2026). The five-year roadmap recognises that significant improvements in the water productivity of rice farming systems in Australia are of the highest priority. The Australian rice industry has set itself an aspirational target of producing 1.5 tonnes of rice per megalitre of water within five years.

An important part of achieving this goal is the establishment of Rice Breeding Australia. Rice Breeding Australia was established on 1 June 2022 as a not-for-profit company, with membership from AgriFutures Australia, the SunRice Group and the RGA. The new company will embed a commercial focus and introduce state-of-the-art breeding technologies to accelerate the development of new varieties that meet the needs of discerning consumers and market requirements, with increased water productivity and improved cold tolerance.

Chairman and Independent Director of Rice Breeding Australia, Dr Steve Jefferies brings a wealth of experience to the role having most recently been the Managing Director of the Grains Research and Development Corporation from 2016 to 2020 and prior to that, the inaugural CEO of Australian Grain Technologies Pty Ltd, Australia's largest and market-leading plant breeding company.

Dr Jefferies hopes to build on the long and successful history of rice breeding in Australia and develop new, more water-productive varieties to secure a strong future for the industry.

"The aim of Rice Breeding Australia is to provide new energy and a commercial focus to rice breeding so that it can be a key part in achieving the major transformation in water productivity and ultimately be an important contributor to the long-term viability of the Australian rice industry", he said.

Dr Jefferies explained that the company will operate out of the Riverina region of New South Wales, where more than 98% of Australia's rice production occurs.

"Rice Breeding Australia is committed to the long-term future of the Australian rice industry and as such it plans to remain based in the heartland of the Australian rice industry in the Riverina region in southern NSW", he said.

"The company will continue to develop new rice varieties for all Australian rice production areas and will do this from this base".

Rice Breeding Australia has also just announced its inaugural Chief Executive Officer, Dr Georgina Pengilley, who will be responsible for the overall strategy and management of the company. Georgina is an experienced leader with a strong focus and commitment to delivering on the ground, and a passion for community, agriculture, and education. Georgina's most recent role as Leader of Pulses and Oilseed – North for NSW Department of Primary Industries saw her lead a team that transformed chickpea breeding in Australia to the largest scale and most state-of-the-art chickpea breeding program in the world, indicating that the future of rice breeding is in very safe hands.

"I am excited about the opportunity I have been given by the Board of Rice Breeding Australia to build on the successes of the past and develop it into a world-leading breeding program. I am looking forward to working closely with the rice industry to drive transformational change that will build long term sustainability, while continuing to see Australia as a global leader in rice production and quality", she said.

Other Directors of Rice Breeding Australia are David Keldie (SunRice Group), Graeme Kruger (RGA), and Roseanne Healy (AgriFutures Australia).

Rice Breeding Australia will work closely with other organisations involved in agronomic research, pre-breeding research, AgTech development and more towards achieving the Australian rice industry's water productivity goal.

For more information about the AgriFutures Rice Program, visit the AgriFutures Australia website:

https://www.agrifutures.com.au/rural-industries/rice/

QUEST TO DIGITISE ONE MILLION PLANT SPECIMENS

The Australian National Herbarium in Canberra is imaging nearly a million plant specimens using an automated system developed by Netherlands company Picturae. CSIRO Group Leader for Digitisation & Informatics, Pete Thrall, who oversees digital assets at the National Research Collections Australia, managed by CSIRO, Australia's national science agency, said the project would help inform bushfire recovery and biosecurity."Digitising the herbarium is a huge leap forward for sharing specimens for research. As a result, we'll be able to provide information quickly for projects like bushfire recovery and biosecurity," Mr Thrall said."Creating a digitised replica also provides security for the herbarium's irreplaceable physical specimens," he said. Parks Australia imaging manager Ms Emma Toms, located at the Australian National Herbarium, who is coordinating the Picturae project, said the work would be completed over the next 9 months."To digitise these specimens in house would have taken us about eight years using a standard camera rig," she said."The first step is a visual check of each specimen to ensure it is in good condition and has a barcode to link to its digital record."Three people operate Picturae's conveyor belt, which moves specimens under a camera to take a high-resolution photograph. Two people unpack the specimens at the start of the conveyor belt and one person repacks the specimens and checks the photographs for any errors," she said.One of the new technologies transforming the utilisation of collections is artificial intelligence (AI).CSIRO Postdoc Dr Abdo Khamis said machine learning and AI enables researchers to extract trait information from images. "We can use digitised herbarium specimens to understand how plants are responding to climate change, for example by determining how the reproductive structure of flowers is changing with time," he said.The team will continue to grow the herbarium's digital assets as more plant specimens from Australia and the region are added to the collection."We will have an inhouse digitisation programme once this process is complete, so new specimens will be photographed before they are incorporated into the collection," Emma Toms said.The full digital collection of the Australian National Herbarium will be made available through the Atlas of Living Australia, including for the general public.The Australian National Herbarium is part of the Centre for Australian National Biodiversity Research, a joint venture between Parks Australia's Australian National Botanic Gardens and the National Research Collections Australia at CSIRO.

DOWNY MILDEW CONCERN IN GRAPEVINES SHINES LIGHT ON UNIQUE NEW FUNGICIDE

Widespread testing for downy mildew resistance to fungicides in grapevines has revealed varying levels of sensitivity in different regions, dialling up the pressure on existing disease management programs and the need for new fungicides.

Downy mildew remains one of the top three diseases affecting grapevines, costing growers millions of dollars annually. Bayer Crop Science recently carried out resistance testing of the fungicides commonly used for downy mildew control, as well as a new mode of action foliar fungicide it plans to introduce this year. Darren Alexander, Bayer Horticulture Territory Business Manager in South Australia and the Sydney Basin, said downy mildew infection samples were collected from various field locations across Australia and analysed for sensitivity to fungicides, mainly at the South Australian Research and Development Institute in Adelaide. "The results showed the downy mildew fungi had varying sensitivities to the products tested depending on the region. Throughout SA, there was not a lot of resistance to existing products, however in other regions such as Griffith and the Hunter Valley in New South Wales, down to the Yarra Valley in Victoria, there was different sensitivity to products like metalaxyl. This is one of the important active ingredients with curative effects that growers have long reached out to under high pressure conditions," Darren said. "If there is a loss of sensitivity to the performance of metalaxyl to the point it starts failing in the field, that's potentially one less tool growers will have. "A couple of products showed mid to high sensitivity loss and could have reduced effectiveness for disease control, indicating the current effective chemistry available to growers is likely to diminish in the near future." He said growers not rotating or mixing up their fungicide programs risked resistance to those products in their vineyards. "By mixing up chemicals within programs and from season to season, growers can extend the effective life of different chemistries against downy mildew. Combining multiple groups of fungicides to ensure there is less pressure on any single fungicide mode of action is an approach that is encouraged by the Fungicide Resistance Action Committee (FRAC) – and is becoming well adopted. Growers should also make sure they use products at the right rate and spray volume appropriate to the canopy." "With climate change increasingly changing regional weather patterns, it's becoming harder to predict a normal season, so running a protective program is increasingly becoming a beneficial approach – being ahead of the game, rather than chasing your tail. "In regions of high pressure, where downy mildew persists year-in year-out, there is a need to look at new chemistry, adopting different modes of action to make sure all available tools are used to combat the disease and ensure crops are protected through to harvest."

Xivana® Prime, a unique mode of action (Group 49) fungicide registered in grapes by Bayer Crop Science, containing the active ingredient fluoxapiprolin, showed no resistance to downy mildew isolates in any of the samples tested from across all regions.

> **"The new mode of action will add extra protection to the programs growers are using and help take the pressure off and prolong the life of existing fungicides. Some growers have a limited number of products for the applications they want to apply,"**
>
> **Darren Alexander, Bayer Horticulture**

Registered for use in both wine and table grapes, Xivana Prime acts on all stages of the downy mildew lifecycle, providing a strong tool in a protective program.

"The new mode of action will add extra protection to the programs growers are using and help take the pressure off and prolong the

Downy mildew on grapevines

life of existing fungicides. Some growers have a limited number of products for the applications they want to apply," Darren said.

"Xivana Prime is best applied in a program for protective activity. If it is applied following conditions that are conducive to downy mildew, it can provide effective protection, so long as it is applied before oil spots are seen in vineyards.

"It has a wide application window for downy mildew within the growing season, from 10 cm shoots (E-L 12) through until 7 mm berries (E-L 31).

"Another major benefit with Xivana Prime is the residue profile, allowing it to be used quite late in the growing season, with no measurable transfer of fluoxapiprolin to wine when used as directed.

"Additionally, Xivana Prime offers a longer lasting spray interval than some leading products, being 10-21 days depending on growth dilution and disease pressure, and it has a great safety profile for pollinators and beneficial insects when used as directed."

Darren Alexander, Bayer Horticulture Territory Business Manager in South Australia and the Sydney Basin,

To ensure the longevity of the new mode of action for years to come, and to support the continued effectiveness of existing fungicides, Darren said Bayer Crop Science recommended Xivana Prime always be used in a mixture with another effective downy mildew product, as per resistance management guidelines.

Trials conducted with Xivana Prime have shown that for effective downy mildew control, it is essential to use an adjuvant, with Maxx®, Pulse® Penetrant, Hasten® or Agridex® all recommended.

Trials have also been conducted to demonstrate that Xivana Prime has excellent compatibility with other products that may be added for powdery mildew, botrytis bunch rot and light brown apple moth control. Excellent compatibility has also been shown with other products used in viticulture.

"Some of the tank mixes for powdery mildew included the use of wettable sulphur, Prosper® and Talendo®, and we also looked at botryticide tank mixes including with Teldor®, Switch®, Scala®, chlorothalonil and the biological product, Serenade® Opti, and all were found to be compatible with Xivana Prime, even when used with other tank mix partners such as copper and mancozeb," Darren said.

Source: *www.crop.bayer.com.au*

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A NEW DAWN IN PLANT BREEDING: AUSTRALIAN PLANT BREEDING ACADEMY

The University of Adelaide's School of Agriculture, Food and Wine is partnering with Australian Grain Technologies Pty Ltd (AGT) on a new academy to take Australia's plant breeding into the future. (2021)

The Australian Plant Breeding Academy will lead a new era in research and education in Australia. This includes the development of a new research program aligned with priority crops and traits to break new ground in plant breeding.

> ***"Under the new Academy, we have the opportunity to continue our role in this area, and maintain our very strong connection with industry."***
>
> **Professor Jason Able from the University of Adelaide's School of Agriculture, Food and Wine**

The partnership will also see the appointment of a Breeding Research Fellow responsible for the Academy's breeding research portfolio, and the establishment of multiple PhD scholars in plant breeding, the first of which will commence in 2022.

Both the University and AGT have a proud and successful history of involvement in commercial plant breeding programs, including bread wheat, durum wheat, barley, canola, lupins, triticale and faba beans. The new Academy will build on this enduring legacy of achievement.

Equally, both organisations are committed to producing the next generation of plant breeders and plant breeding scientists, to secure the industry's ongoing success.

The academy is believed to be the first of its kind for plant breeding in Australia, and will deliver significant benefits to the industry in the medium to long-term.

Professor Jason Able from the University of Adelaide's School of Agriculture, Food and Wine said: "The success of the University's breeding endeavours over the past 60-plus years can be found throughout the Australian agricultural industry today.

"Under the new Academy, we have the opportunity to continue our role in this area, and maintain our very strong connection with industry."

Professor Anton Middelberg, Deputy Vice-Chancellor (Research), the University of Adelaide, said: "The University is delighted to continue its long association with plant breeding through this new strategic partnership.

"The partnership brings together a leading institution and the nation's foremost grain technology company, both of which are committed to driving future innovation and excellence in research and education in Australia's agricultural sector."

AGT CEO and Head of Breeding Haydn Kuchel said: "Through its activities in education and breeding research, the Australian Plant Breeding Academy will lift the capability of the agrifood sector across Australia and maximise future profits for growers."

AGT Head of Science and Business Development Tristan Coram said: "AGT has a long history of engagement in both undergraduate and postgraduate education, and we see the expansion of this effort under the new Academy as crucial for the long-term sustainability of Australian agriculture."

SNAPSHOT OF AUSTRALIAN AGRICULTURE 2022

This Insights report describes the current state of Australian agriculture, with the aim of providing key information and statistics in one place. It covers eight key aspects of Australian agriculture: its role in the broader economy, trends in production, industry structure and productivity, climate change impacts and risk management, agricultural employment, government support, trade and impacts of the COVID-19 pandemic.

AGRICULTURE'S PLACE IN AUSTRALIA

Australian agriculture accounts for:

55% of Australian land use (427 million hectares, excluding timber production, in December 2020) and 24% of water extractions (2,746 gigalitres used by agriculture in 2019–20);

12% of goods and services exports in 2020–21;

1.9% of value added (GDP) and 2.5% of employment in 2020–21 (Figure 1).

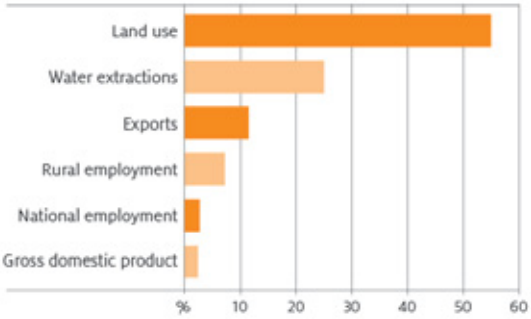

FIGURE 1 Selected contributions of agriculture

Sources: *ABS Water Account (cat. 4610); Catchment scale land use of Australia – update December 2020, ABARES; ABS Balance of Payments (cat. 5302); ABS Labour Survey (cat. 6291); ABS National Accounts (cat. 5206)*

The mix of Australian agricultural activity is determined by climate, water availability, soil type and proximity to markets. Livestock grazing is widespread, occurring in most areas of Australia, while cropping and horticulture are generally concentrated in areas relatively close to the coast (Figure 2).

Agriculture accounts for over half of Australia's land use so the sustainable management of this land is an important issue for both farm businesses and the general public.

There are many sustainable land practices that have become standard for Australian farmers (Coelli 2021). For example:

- many broadacre cropping farms retain stubble (85% of farms), minimise tillage (68% of farms) and optimise the use of (and reduce reliance on) pesticides or fertiliser (65% of farms).
- many livestock farms are using a variety of grazing management systems such as cell, strip or rotational grazing (61% of farms) and setting a long-term groundcover

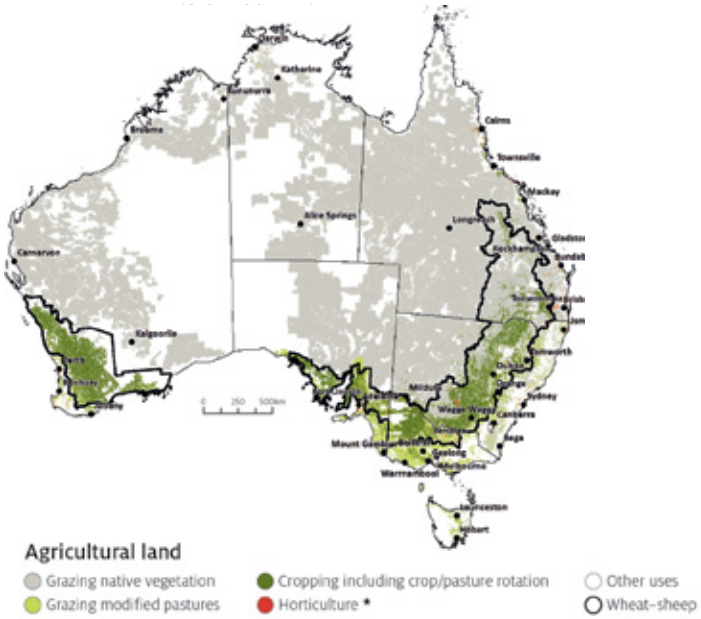

FIGURE 2 Agricultural production zones

Note: * Exaggerated to improve visibility.

Sources: *Wheat-sheep zone – Australian Agricultural and Grazing Industries Survey, 2016, ABARES; Catchment scale land use of Australia – update December 2020, ABARES; ABS Agricultural Commodities, Australia, 2019–20 (cat 7121)*

SEVEN NEW VARIETIES OF WHEAT CLASSIFIED FOR 2022/23

Seven new varieties of wheat have been classified as part of the 2022/23 Wheat Variety Master List, including six Premium Hard milling varieties and one Durum variety. In addition, two new feed varieties have been introduced.

General Manager, Classification at Grains Australia, Dr Megan Sheehy said the release of the 2023/23 Wheat Variety Master List is the continuation of crucial work to improve the competitiveness of Australian wheat worldwide and ensure its quality.

"Maintaining a market-driven variety classification system for wheat that delivers for customers and producers is a core focus for Grains Australia following our integration with Wheat Quality Australia earlier this year.

"Grains Australia is pleased to continue delivering the key technical function for the Australian wheat industry that is the Wheat Variety Master List," said Dr Sheehy.

2022/23 Wheat Variety Master List highlights include

Seven new varieties classified:

- Boree
- Brumby
- Calibre
- Jillaroo
- LRPB Anvil
- Willaura
- DBA Mataroi (Durum)

Two new varieties introduced (feed):

- Big Red
- RGT Cesario

Variety upgrades including:

- Suntop and Sunmaster to Australian Prime Hard (APH) in the Southern Zone
- Ballista to Australian Hard (AH) in the Northern Zone
- Hammer CL Plus to Australian Premium Noodle (APWN) in the Western Zone
- Longsword to Australian White Wheat (AWW) across all zones
- - HAW1 has been classified as Australian Innovative Wheat (AIW)

In addition, nine varieties have been removed from the 2022/23 Wheat Variety Master List after a long period of consultation with industry, having been first flagged for removal in 2020 and delivered in their existing class up until 2021.

Based on decreasing production thresholds, four varieties are planned for removal in 2023 including Diamondbird, Envoy, Kunjin and Wedin. Then in 2024, 19 varieties are planned for removal including Impose CL Plus, Justica CL Plus, Forrest, Preston, EGA Eagle Rock, Ellison, GBA Sapphire, EGA 2248, Carnamah, Kennedy, H45, Sunlin, Petrel, Sunbrook, Stiletto, Sunbri, Sunco, Spear and Halberd T/N.

The reclassification of Strzelecki to Australian Premium White (APW) is planned for 2024 in the South Eastern and Northern Zones.

The 2022/23 Wheat Variety Master List comes into effect on 1 August 2022 and contains the names of all current varieties approved by Australia's wheat classification process. Following the integration of Wheat Quality Australia into Grains Australia earlier this year, this classification process is managed by Grains Australia. The Master List records the highest possible grade available for respective varieties and is updated annually, forming part of each season's Grain Trade Australia (GTA) Wheat Standards.

The 2022-23 Wheat Variety Master List is available at grainsaustralia.com.au. Grain Trade Australia Trading Standards, including for wheat, are available at graintrade.org.au.

What's new for canola growers in 2023

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HIGH-END AUSSIE CHERRIES TRENDING IN VIETNAM AND MALAYSIA

SOLD OUT

Malaysian influencer Abang Brian shared his love of Aussie cherries with Malay and urban English audiences.

A targeted campaign across Vietnam and Malaysia featuring luxury, ribbon-handled gift boxes filled with premium Australian cherries has resulted in close to 4000 boxes sold and importers and consumers wanting more.

The inaugural effort between Taste Australia, a joint initiative led by Hort Innovation with Australian growers and AUSTRADE, and five leading importers was timed to support sales activities in the lead up to the Lunar New Year peak season.

Hort Innovation head of trade Brei Montgomery said the aim of the campaign was to educate importers, retail partners, influencers, media and most importantly consumers on the premium nature and high quality of Australian cherries – and the results were encouraging.

"By all accounts, the cherry displays we had in place in major retail outlets across Vietnam and Malaysia were attracting large crowds, and consumers enjoyed the novelty of this high-end offering," she said.

"All of the boxes sold out, and our importer partners have requested that we supply a larger number next season, which is really positive."

The campaign was underpinned by a targeted social media element that was supported by a squad of social media influencers, from celebrity chefs to urban style gurus.

Ms Montgomery said influencer engagement is imperative to reaching target audiences, especially in Malaysia where consumers are proficient users of social media and use it to interact with the brands they enjoy.

Malaysian importer Khaishen Trading representative Tracey Lee said the campaign resonated with her customers.

"The in-store activation helped us increase the sales volume as repeat ordering is better after promotional activities, and there was a lot of buzz this year on social media," she said.

A shopper at Malaysian supermarket Village Grocer, Triptpal Kaur, said he was delighted with this season's Australian cherry offering.

"Australian Cherries are one of my favourite fruits and each year I always buy them for my clients as a Chinese New Year gift. Trying fruits at the supermarket helps me to decide if I'll purchase or not. I also love the premium gift, it's good quality."

According to the *Australian Horticulture Statistics Handbook*, in the 2020/2021 financial year, 16 per cent of Australia's cherries were exported to Vietnam, while a further 4.53 per cent were exported to Malaysia. Victoria, New South Wales, Tasmania and South Australia are Australia's top cherry producing states, followed by Queensland.

"Australian Cherries are one of my favourite fruits and each year I always buy them for my clients as a Chinese New Year gift. Trying fruits at the supermarket helps me to decide if I'll purchase or not. I also love the premium gift, it's good quality."

Triptpal Kaur

VARROA MITE OUTBREAK

VARROA MITE DETECTED IN NSW

The NSW Government is urging beekeepers across the state to safeguard their industry after biosecurity surveillance detected Varroa mite in hives at the Port of Newcastle.

NSW Agriculture Minister Dugald Saunders says swift measures are being taken to contain the disease, which is the most serious pest for honey bees worldwide.

“We have immediately launched an eradication plan which involved setting up a biosecurity zone, containing the infected hives and euthanisina the bees.” Mr Saunders said.

If you have bee hives located within the biosecurity zone please notify DPI of their location by calling 1800 084 881

“Australia is the only major honey producing country free from Varroa mite and if it has the chance to establish here, it could cost the honey industry more than $70 million a year.

The Biosecurity Zone covers an area within a 50 kilometre radius of the Port of Newcastle. Beekeepers within this zone must not move or tamper with their hives.

They must also notify the NSW Department of Primary Industries with the location of all of their hives.

“Biosecurity is one of my top priorities and beekeepers have been working with the Government through the National Bee Pest Surveillance Program to act as an early warning system,” Mr Saunders said.

“If it weren’t for their diligence in monitoring hives and catch boxes at strategic locations around our ports and airports, this threat may have gone undetected.”

The mites are tiny reddish-brown parasites and are easily identifiable to the naked eye.

If you have bee hives located within the biosecurity zone please notify DPI of their location by calling 1800 084 881 or completing the form on this website: https://forms.bfs.dpi.nsw.gov.au/forms/9247

STATEWIDE EMERGENCY ORDER ISSUED FOR VARROA MITE IN NSW

A statewide emergency order has been issued to control the movement of bees across NSW and stop the spread of varroa mite.

Minister for Agriculture Dugald Saunders says the order has taken effect from 6.00 o'clock tonight.

"After the first detection of varroa mite at the Port of Newcastle on Friday, DPI is investigating potentially contaminated hives outside the initial 50 kilometre biosecurity zone," Mr Saunders said.

"That includes a property near Trangie in central west NSW, where containment and control activities will be carried out tomorrow.

"If varroa mite settles in the state, it will have severe consequences, so we're taking every precaution and action needed to contain the parasite and protect the local honey industry and pollination."

The statewide order is a fourth tier general emergency zone that has been added to the existing zones, in which no bees are allowed to be moved across NSW.

A 50km biosecurity zone is still in place around the port of Newcastle and beekeepers within that area must also notify the NSW Department of Primary Industries of the locations of their hives.

A 25km surveillance zone is also still active around the site, where officials are monitoring and inspecting managed and feral honey bees to limit the extent of the incursion.

A 10km emergency zone around the Port remains in place, where eradication plans will be enacted to treat hives, including at a new fourth property that has been identified.

"Australia is the only major honey producing country free from varroa mite, the most serious pest to honey bees worldwide," Mr Saunders said.

"We're working with apiary industry bodies and stakeholders to ensure beekeepers are well informed and can continue to help us with this critical response".

The mites are tiny reddish-brown parasites and are easily identifiable to the naked eye.

If you have bee hives located within the 50km biosecurity zone please notify DPI of their location by calling 1800 084 881, completing the form on this website: https://forms.bfs.dpi.nsw.gov.au/forms/9247 or emailing hive.location@emergency.dpi.nsw.gov.au.

For more information visit:

https://www.dpi.nsw.gov.au/varroa

RETURNING COTTON TEXTILE WASTE TO COTTON FIELDS

GROUND BREAKING TRIAL SHOWS PROMISING RESULTS

A 12-month trial on a cotton farm just outside the rural town of Goondiwindi, Queensland, has shown it is possible to divert large amounts of cotton textile waste at end of life from landfill with no harm done to soil health or cotton yields.

Project collaborators are confident that with a solid business plan and more research, returning shredded cotton products to cotton fields could soon offer benefits to soil health, and a scalable solution to the massive global problem of textile waste.

“At the very least the trial showed that no harm was done to soil health, with microbial activity slightly increased and at least 2,070kg of Carbon Dioxide equivalents (CO2 e) mitigated through the breakdown of these garments in soil rather than landfill,” cotton industry supported soil scientist Dr Oliver Knox said.

“The trial diverted around two tonnes of textile waste from landfill with no negative impact on cotton planting, emergence, growth or harvest. Soil carbon levels remained stable, and the soil’s bugs responded well to the added cotton material.

“There also appeared to be no adverse effect from dyes and finishes although more testing is needed on a wider range of chemicals to be absolutely sure of that.”

According to farmer Sam Coulton the cotton fields easily “swallowed up” the shredded cotton material, giving him confidence that this composting method has practical long-term potential.

“We spread the cotton textile waste a few months before cotton planting in June 2021 and by January and the middle of the season the cotton waste had all but disappeared, even at the rate of 50 tonnes to the hectare,” Sam said.

“I wouldn’t expect to see improvements in soil health or yield for at least five years as the benefits need time to accumulate, but I was very encouraged that there was no detrimental impact on our soils.

“In the past we’ve spread cotton gin trash on other parts of the farm and have seen dramatic improvements in the moisture holding capacity on these fields so would expect the same using shredded cotton waste.”

The project, under the guidance of circular economy specialists Coreo, was a partnership between the Queensland Government, Goondiwindi Cotton, Sheridan, Cotton Australia, Worn Up and Cotton Research and Development Corporation supported soil scientist Dr Oliver Knox of UNE.

About two tonnes of end-of-life cotton textiles from Sheridan and State Emergency Service coveralls were processed at Worn Up in Sydney, transported to “Alcheringa” farm, and spread onto a cotton field by Sam.

According to Cotton Australia’s Brooke Summers there is keen interest in further collaboration from industry groups, government, farmers, brands and potential investors.

“There’s certainly a huge amount of interest in this idea and the trial results and while we don’t want to get ahead of ourselves,

“We spread the cotton textile waste a few months before cotton planting in June 2021 and by January and the middle of the season the cotton waste had all but disappeared, even at the rate of 50 tonnes to the hectare,”

Sam Coulton

we are hopeful that over time this will evolve to deliver a scalable solution for cotton textile waste here in Australia," Brooke said.

"We're excited to announce the trial will be replicated in the 2022-23 cotton season, with cotton farmer Scott Morgan's Gunnedah property in NSW added as a second site. This will give us further confidence the results we've already seen can be replicated across time and geographies.

"These results show us that it's possible to find a scalable solution to cotton textile waste right here in Australia by returning these products to our farmlands. We know there's more research to be done and there are a lot of challenges still to overcome but the fact that it's possible is what's so exciting."

Coreo CEO Ashleigh Morris said they were encouraged by the results of the trial and its "green light" to continue exploring circular economy opportunities for end-of-life cotton textiles.

aines Australasia president Tanya Deans said they couldn't be more elated about the success of the trial in Goondiwindi.

"To think that we might have a scalable solution for textile waste on our shores is even more exciting. Hanes looks forward to finding ways to support the next phase of the trials and we hope that this paves the way for more innovative solutions to textile waste in our country," Tanya said.

The project team will now set its sights on how best to collaborate on the way forward with a number of options already on the table:

The Cotton Research and Development Corporation has committed to funding a three-year cotton textile composting research project by the University of Newcastle that will further investigate the effects of dyes and finishes and look at ways to pelletise cotton textiles so it can be spread on fields using existing farm machinery.

A repeat of the trial at "Alcheringa" with Sam Coulton and his team keen to also develop a business case, purchase a shredder and potentially provide a model for employment in regional cotton communities. The trial will also move to a second farm in Gunnedah, NSW, "Kensal Green", owned by cotton farmer Scott Morgan.

Sheridan, together with parent company Hanes Australasia, has committed to provide additional end-of-life cotton textiles and offcuts for the trial in 2022-23.

"This project is such a meaningful demonstration of circular economy collaboration. Benefitting rural communities whilst solving global challenges," Ashleigh said.

Haines Australasia president Tanya Deans said they couldn't be more elated about the success of the trial in Goondiwindi.

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GOONDIWINDI CIRCULAR COTTON PROJECT

TRIAL REPORT

In December 2019, the Transition to Action program visited Goondiwindi to scope possible circularity projects in this regional town of Queensland.

Transition to Action was a collaborative program between circularity specialists Coreo, the Queensland Government's Department of Environment and Science and the local people of Goondiwindi. From this T2A program the Goondiwindi Circular Cotton Project was born.

The project became a collaboration between Coreo, the Queensland Government, local brand Goondiwindi Cotton, cotton farmer Sam Coulton, Sheridan, Cotton Australia and Cotton Research and Development Corporation supported soil scientist Dr Oliver Knox of the University of New England.

The mission was to to test whether shredded cotton products at end of life could be returned to the cotton fields, offering both benefits to cotton soil health, and a scalable solution to textile waste.

Read the Transaction to Action report on circular economy at https://australiancotton.com.au/assets/downloads/T2A-QLD-Report-Final-Dec-2020-2.pdf

PHASE 1: LAB TESTS

Back in 2020, Phase One of the project involved lab-based testing cotton fabrics to assess what might happen during the biodegradation process, in terms of potential benefits such as carbon and water retention in soils. The results of the Phase One lab tests, analysed by Dr Oliver Knox with support from the Cotton Research and Development Corporation, showed:

- Adding cotton fabric samples to soil increased levels of microbial (bacterial and fungal) activity in all but one sample. • When added to soil all but the tightest weave of cotton material broke down significantly in about 24 weeks. • Cotton seeds germinated just as well in soil to which cotton fabric had been added as it did in soil to which no material had been added.

These results encouraged the team to move to a field trial which was implemented during the 2021-22 cotton season.

PHASE 2: FIELD TRIAL

In June 2021 around two tonnes of cotton textiles, garments and end of life State Emergency Service coveralls were processed at Worn Up in Sydney, transported to "Alcheringa" farm, and spread onto a cotton field by local farmer, Sam Coulton. The field was being prepared for planting the next cotton crop in October 21. It was hoped the fabrics would break down in the soil, increase microbial activity, lock in carbon and provide cover to improve soil moisture.

Projections showed 2,250kg of atmospheric Carbon Dioxide equivalents (CO2 e) would be mitigated through the breakdown of these garments in soil rather than landfill. The trial looked at the breakdown process at different application rates, and assessed effects on soil nutrition, respiration/CO2 and microbial biomass.

The trial was concluded at cotton harvest in May 2022, with initial results reported at australiancotton.com.au/assets/downloads/Goondiwindi_Circular_Cotton_Project_Trial_Results__July_2022.pdf

Although it's expected the real benefits for cotton yield and long-term soil health may not be known for many years.

NEXT STEPS

There is much interest in further collaboration from industry groups, government, farmers, brands and potential investors. In order to establish the feasibility of this approach as a scalable solution to cotton textile waste, more research is required as a next step.

Year 2 Trials Due to Covid and floods we recognise that the first trial wasn't perfect. We're excited to announce that the trial will be replicated during the 2022-23 cotton season, with an additional farm in Gunnedah NSW added as a trial site.

Sheridan is providing at least 10 tonnes of shredded cotton textiles for these trials. This will give us further confidence that the results we've already seen can be replicated across time and geographies.

CRDC Commits to Compost Research The Cotton Research and Development Corporation (CRDC) has committed to funding cotton textiles composting research that will further investigate the effects of dyes and finishes and look at ways to pelletise cotton textiles so it can be spread on fields using existing farm machinery. This is a three year commitment from CRDC with approx $300,000 investment.

WANT TO GET INVOLVED? ANY GROUP OR INDIVIDUAL INTERESTED IN COLLABORATING CAN CONTACT THE TEAM.

HTTPS://AUSTRALIANCOTTON.COM.AU/CONTACT/

VALUE OF AGRICULTURAL COMMODITIES PRODUCED IN AUSTRALIA

Final estimates of gross and local values of production of major agricultural commodities for Australia, states and territories for the 2020-21 financial year.

KEY STATISTICS

- The gross value of Australian agriculture increased 17% to $71 billion in 2020-21
- Improved growing conditions drove the gross value of broadacre crops to $23 billion (up 79%)
- The gross value of livestock disposals and livestock products decreased 5% to 31 billion

VALUE OF STATE AGRICULTURAL PRODUCTION

The gross value of New South Wales' agriculture jumped $6.8 billion (or 61%) to $18 billion. The increase was largely driven by a close to ideal cereal crop season experienced in the state. To a lesser extent, both Queensland and Western Australia also recorded increases in gross value of agriculture; up 7% to $14.5 billion and up 14% to $10.2 billion respectively. Victoria had a mixed season which was reflected in a 2% drop in its gross value of agriculture to $17.5 billion, driven by falls in the value of livestock disposals (down 9%) and livestock products (down 4%).

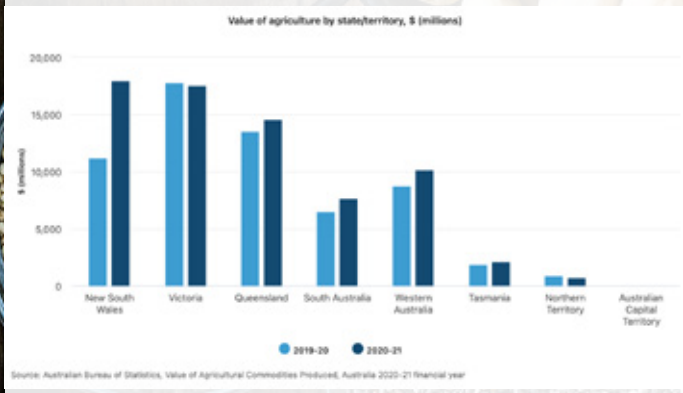
VALUE OF CROPS

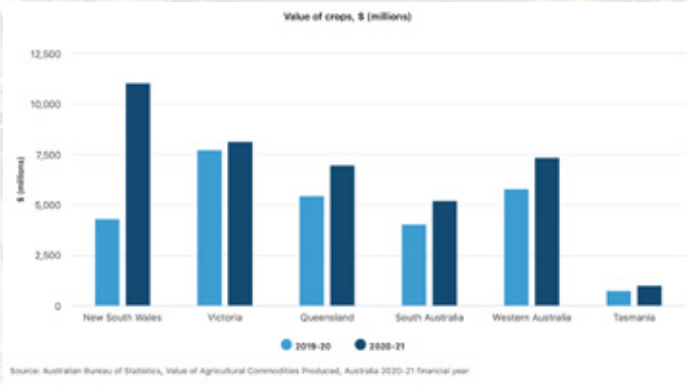
Total gross value of crops increased 41% to $40 billion in 2020-21. Improved seasonal conditions in many parts of the country saw increases in the production, and in turn, value of many crops. Notable increases in the production of wheat, barley and canola were observed, particularly in New South Wales which experienced near perfect growing conditions for many cereal crops. Easing of drought conditions also saw water allocations improve for irrigators with dramatic increases in the production and value of cotton as well as a range of other irrigated crops, including fruit and vegetables.

KEY CROP RESULTS FOR 2020-21:

- $9.9 billion for wheat (up 99% from 2019-20)
- $6.3 billion for fruit and nuts (up 16%)
- $4.8 billion for vegetables (up 14%)
- $3.7 billion for barley (up 24%)
- $2.9 billion for canola (up 114%)
- $2.2 billion for hay (down 15%)
- $1.5 billion for cotton (up 481%)

Released by the *Australian Bureau of Statistics* **26/07/2022**





NEW SOIL DATA TECH OFFERS NEW APPROACH

A NEW soil analysis technology package arriving for Australian agriculture could change the traditional way soil data has been collected in future, as well as deliver considerable efficiencies and significantly improve seasonal and long-term farm management decisions.

Soil data has largely been compiled from collecting physical soil samples over summer, further refined in recent times with the use of satellite imagery and various paddock information maps to assist the rise of prescription farming and guide ongoing soil amelioration programs.

The latest technologies automatically collect soil samples and data from thousands of sites in each paddock and offer ongoing tracking of soil measurement changes throughout seasons until the next paddock cultivation occurs.

The new soil technology package is being introduced by Carbon Ag Technologies, a collaboration between soil and plant improvement company, Carbon Ag, and agricultural data capture and management business, AxisTech, who also are the project developers of an in-ground soil scanning probe.

The technology package includes the iScan deep soil mapping module for mounting on seeding bars, which collects measurements every metre as they traverse paddocks. From the thousands of data points and associated paddock measurement maps generated, the soil probes are then intended to be deployed at numerous targeted sites to provide ongoing, real-time soil measurement monitoring to a depth of 30 centimetres.

Wes Lawrence, of Carbon Ag Technologies and AxisTech, said used in combination, the systems delivered a unique soil dataset that would better optimise in-season and longer-term product applications and management strategies, in addition to achieving welcome efficiencies compared with the traditional task of soil sampling. And while the volume of soil data collected and related paddock mapping was intricate, it could be used, in conjunction with other paddock maps and data, to sharpen but simplify management decisions.

Wes said initially the technologies would produce paddock maps for soil pH, nitrogen, EC (electrical conductivity) and carbon, as well as provide soil moisture, temperature and bulk density measurements. Other key soil elements will be included in the

Photo caption 5: Pictured is a prototype of the iScan deep soil mapping module mounted on an Ausplow DBS seeding bar, which collects soil samples and data from thousands of sites in each paddock for generation of soil pH, nitrogen, organic carbon, electrical conductivity (EC), moisture and temperature maps. Paddock maps also are expected to be produced for other key soil elements as the technology further develops.

measurements as the technology further develops.

“Automatic collection and mapping of comprehensive soil pH data at seeding via the iScan unit saves the task and cost of paddock scanning or sampling earlier and offers the opportunity of more accurate variable lime applications and improved data for return on investment modelling,’’ Wes said.

“It’s a similar story with soil nitrogen, with the unique dataset, which can be combined with other layers of nitrogen information and management, allowing better optimised variable applications in-season, targeting more responsive zones and maximising efficiency.’’

He said after first collecting the soil data at seeding, followed by the ongoing measurements with the soil scanning probes, other nitrogen management and applications possibly upfront and at seeding could then be fine-tuned in subsequent seasons.

It is hoped the Carbon Ag Technologies’ soil organic carbon measurement also will be approved by the Emissions Reduction Fund, allowing growers to gain a soil carbon baseline for their properties for consideration of sequestration projects and potential generation of Australian Carbon Credit Units (ACCUs) in future. The soil probes provide the ability to track soil carbon levels over time, automatically producing real-time measurements.

Wes said by assisting growers to continually optimise product use efficiency, better manage their natural resources and adapt farming systems to suit changing climatic conditions, the unique dataset also could prove beneficial to guard against any future environmental impact regulations.

Several growers already have been involved in successful testing of the soil measurement technologies. Rather than requiring a capital equipment investment, Carbon Ag Technologies is set to offer the iScan seeding bar units, soil probes and generation and management of related soil measurement data and paddock maps under a leasing arrangement with growers.

Furthermore, growers also could collate the latest data with their historical soil measurement records from their properties and access up to $10,000 by participating with AxisTech in the Federal Government’s $21 million Historical Soil Data capture program.

The Carbon Ag Technologies team, including Brad Wisewould, Carbon Ag, Wes Lawrence, AxisTech, and Damon Buckley, who is leading the development of an in-ground soil scanning probe, discuss some of the paddock maps produced from data collected by the iScan deep soil mapping module that is mounted on seeding bars.

CANERGROWERS WORKER SHORTAGE

SUGARCANE HARVEST NEEDS WORKERS

Australia's sugarcane growers are worried a shortage of workers could mean they'll struggle to harvest a good-looking and sizeable crop this year so peak grower organisation CANEGROWERS is calling for people with experience to head north for winter.

"This year's crop is looking bigger than last year's 30 million tonnes in the cane growing regions of Queensland and northern New South Wales," CANEGROWERS CEO Dan Galligan said. "But we are facing a challenge across the industry to put crews in the machinery and vehicles needed to cut the cane and take it to the sugar mills."

From Mossman in Far North Queensland to Grafton in New South Wales, the annual cane harvest is a huge undertaking and people with relevant skills are being urged to register their interest on the CANEGROWERS website Work in the Industry page.

"The industry has a fleet of around 700 harvesters and each needs a crew of at least three – one harvester driver and two operators of haulout vehicles to take the cut cane from the fields to transport delivery points," Mr Galligan said.

"These jobs are rewarding, and the communities and locations are dynamic. Sugarcane grows in some very iconic landscapes, and we are inviting skilled workers to share our piece of paradise."

96% of CANEGROWERS members who responded to a recent poll said that last season they, or their contractors, had experienced disruptions to farming operations because of a lack of workers and they're worried the situation will be repeated in 2022.

"Sugarcane growers are resilient, facing extreme weather, riding the rollercoaster of global sugar prices and navigating a complicated regulatory environment. Until recently, labour shortages weren't such a challenge," Mr Galligan said.

"CANEGROWERS is reaching out to agricultural workers, recent retirees and people with experience who want to travel to Queensland, soak up the winter sunshine, and put their skills to work.

"State borders are no longer an impediment, and we know that our harvest period coincides with a quieter time for some other industries, freeing up workers with experience and skills in truck and tractor driving, agricultural machinery operation and maintenance."

The cane harvest usually runs from June to early Dec, dependant on weather and mill operations and reliability.

"We are calling for interested people to contact CANEGROWERS. We will pass on their details to growers and contractors via the Work in the Industry page of the CANEGROWERS website aiming to match their needs with skilled people," Mr Galligan said.

"This is a perfect opportunity for workers who have finished seasonal jobs elsewhere to keep earning while also exploring our beautiful part of Australia – the rainforest, waterfalls and of course the Great Barrier Reef which is just next door."

CANEGROWERS members as business owners need to comply with all relevant workplace health and safety requirements and there are specific industry awards covering pay rates.

WORK IN THE INDUSTRY

https://www.canegrowers.com.au/page/about/employment/work-in-the-industry

HORSHAM LEADING PLANT-BASED PROTEIN INNOVATION

The Grains Innovation Precinct at Horsham SmartFarm will receive $12 million from the Victorian Budget 2022/23 to fund a state-of-the-art glasshouse and incubation hub – supporting grain crop industries to diversify into the plant-based protein market.

The new glasshouse will help to advance research and innovation in plant varieties that are climate resilient, have higher protein content and support the growing demand for plant-based foods including those made from lentils, chickpeas, field peas and almonds.

The SmartFarm is already home to two new glasshouses which were recently completed, supported by an additional $10 million co-investment partnership with the Grains Research & Development Corporation.

The project replaced six 50-year-old glasshouses with world-class facilities to accelerate the delivery of more profitable lentil and field pea varieties for Victorian growers.

Western Victoria is a state leader in producing crops that can be used in plant-based protein products such as lentils, faba bean, field peas and canola. Once complete, the glasshouse complex will help maximise the region's capabilities and opportunities to tap into new markets, support jobs and boost future investment.

The glasshouse will also support innovation at a new Science and Business Incubation Hub — a space where Agriculture Victoria, entrepreneurs and industry can come together to collaborate and explore product opportunities for plant-based proteins.

The hub will include a collaboration space to house commercial start ups and attract and secure postgraduate students, as well as offering facilities such as a test kitchen and analytic equipment to explore opportunities for alternative proteins.

VITERRA PUBLISHES LATEST PLANTING SURVEY RESULTS AND SEGREGATION PLAN

Viterra has released the results of its 2022/23 planting survey and subsequent segregation plan, as growers across South Australia and western Victoria prepare for the upcoming harvest season.

The data collected in this year's planting survey has highlighted an increase in Commodus and Maximus barley varieties, while planting of Spartacus and Compass has decreased across the board. Viterra can also report a rise in genetically modified (GM) canola planting from 23% of total canola planted in 2021/22, to 31% for 2022/23. Overall plantings of wheat and canola were slightly up, while barley and lentils were among the crops reported to be down.

Based on this data and individual grower consultations, Viterra has released its 2022/23 segregation plan to meet the needs of growers at its storage and handling sites. One of the changes Viterra has flagged this season is potential segregations for Commodus at Port Pirie, Ardrossan, and Pinnaroo. Confirmation of these segregations requires further consultation about the demand of the variety in malt markets which Viterra will conduct with domestic buyers and export customers as this variety is not yet malt accredited.

Meanwhile, segregations for Maximus will continue to be available at Port Pirie and Ardrossan. More consultation is also required to understand any further demand for Maximus in malt markets, as it is understood that international markets for the varietal are currently still at the testing stage. Viterra has added GM canola segregations at both Cummins and Balaklava to match planting survey results, and the company has also added a durum segregation at Port Pirie. A full overview of changes made to the 2022/23 segregation plan, as well as up to date plans for western, central, and eastern regions can be found on the Viterra website.

Customers can also access a break down of data collected from the planting survey online at Viterra.com.au. Viterra is appreciative of all growers and customers who responded to this season's planting survey for their time and feedback.



NEW COTTON INDUSTRY PODCAST LAUNCHED

For the first time, Australian podcast fans will share the sometimes-visceral journey of cotton farmers, and the challenges and opportunities they face out on the land.

The From The Field podcast has been produced by Cotton Australia and was launched today. It helps share the industry's story through five raw and honest conversations, each covering a different topic relating to the industry.

The series features cotton growers Aaron Kiely, Joe Briggs, Amanda Thomas, Alexandria Galea, and Nigel Burnett talking about their industry and sharing their journeys in farming.

"This podcast is essential listening for anyone interested in learning more about the Australian cotton industry, and hearing from the people that grow the crop – our farmers," Cotton Australia CEO Adam Kay said.

"We know there is an appetite from the public, particularly those in the city, to better understand our industry and why we grow cotton in Australia, and we're committed to providing them with the information they need. This podcast is part of our effort to do that.

"The series covers a range of topics about our industry, including cotton's connection to rural communities, the mental health of

farmers, protecting and conserving our rivers, the impact of women in our industry, and cotton's sustainability credentials.

"I encourage everyone, particularly those in urban Australia, to listen to the podcast and find out the true story of Australia's cotton industry."

Season one of the series is available now on Apple Podcasts and Spotify. To listen, search for 'From The Field' or 'Cotton Australia'

Spotify

Listen on Apple Podcasts

MICE ADVICE

Grain growers across the wheatbelt have gathered to hear the latest advice for managing mouse damage to crops this growing season at a series of in-paddock workshops with Steve Henry, leading mouse expert and research officer from Australia's national science agency, CSIRO.

The field walks visited 11 locations across four days, from Calingiri down to Beaumont, as part of a Grains Research and Development Corporation (GRDC) investment addressing increased mouse activity in WA's grainbelt.

Each workshop delivered regionally specific information to help growers control mice throughout the year, with significant crop damage reported in some areas of WA.

The series ran in collaboration with local industry partners and grower groups, focusing on awareness, monitoring and practical information for on-farm management.

Mr Henry's key messages for growers across all locations were to be vigilant in late winter and early spring, complete regular checks for signs of active burrows or crop damage and be prepared to bait if damage is detected.

"In cereals this may be chewing at the node or stem, which causes the head to fall over – from a distance this can look like frost damage," Mr Henry says.

"In canola and legume crops, growers should be inspecting flowers and pods for damage. At the first sign of crop damage, growers need to be prepared to bait, preferably with 50g/kg zinc phosphide spread at 1kg/ha."

Baiting efficacy was a popular topic, with a recent CSIRO mouse bait efficacy study confirming mouse populations can be reduced significantly by doubling the amount of zinc phosphide in grain baits used for broadscale agriculture.

"Baiting at the time of sowing is most effective for protecting recently sown crops, but baiting is also effective for controlling mouse damage during vegetative growth, flowering and seedset," Mr Henry says.

"Spread baits under the best conditions possible, and if you can, ensure a three-day window before rain. If you're going to be spending $20 per hectare on mouse baits, then you want to make sure it's going to be effective."

In Yilliminning, at a field walk hosted by Facey Group, grower Daniel Bird shared his experiences in mouse management this season with local growers, standing in a canola crop heavily impacted by mouse damage.

This is the first year the Bird family, who farm at Windorah Farms between Wickepin and Harrismith, have experienced mouse damage to crops.

Mr Bird says that after noticing mouse holes in the paddock and

mouse damage at crop germination, they have now baited twice, using the recommended 50g/kg zine phosphide baits spread at 1kg/ha.

“We baited 1,000 hectares of crop after seeding, and then 20 per cent of that area again about six weeks later, as we noted the patches of crop damage were getting bigger,” Mr Bird says.

“The canola was planted into wheat stubble, so there would have been a lot of other food around when we baited the first time. That may have led to us having to bait a second time.

“The strip and disc system we use has also left a lot of cover on the ground, which may have contributed to available food for mice.”

A series of in-paddock workshops with Steve Henry, leading mouse expert and research officer, CSIRO, were held in 11 locations across four days as part of a GRDC investment addressing increased mouse activity in WA’s grainbelt.

Mr Bird says that access to information from Mr Henry on mouse management strategies was helping to raise the profile of the issue in the wheatbelt, where mouse damage has not been as common as in the eastern states.

“This is a new issue for growers in this region, but if mouse damage in crops is going to happen across more seasons, then we need to know how to manage it.”

Group discussions from growers focused on managing mice at seeding, maximising efficacy of baiting and economic return, grazing sheep and reducing available food by minimising grain losses at harvest.

GRDC crop protection manager - west Georgia Megirian says that by working with industry partners and grower groups, GRDC’s mouse tours support a locally coordinated response to mouse management.

“The workshops provided in-paddock, seasonally relevant information to growers, with opportunities to look for signs of mouse activity and active burrows, ask questions, optimise management in their particular farming systems and learn about issues other growers are facing.

“With growing indications that mouse activity will reoccur in Western Australia in coming seasons, now is the time to get on top of this issue, and arm growers with the latest advice and management strategies to protect their grain production and their profitability.”

The mouse tours are part of GRDC’s $7.5 million national investment into mouse outbreak research, development and extension (RD&E) with CSIRO, focusing on better understanding mice in cropping systems, such as the impact of residual food in stubbles, increasing surveillance and improving strategic management options.

Growers at a GRDC mouse management field walk with Steve Henry, CSIRO, in Calingiri. Image: GRDC

A series of in-paddock workshops with Steve Henry, leading mouse expert and research officer, CSIRO, were held in 11 locations across four days as part of a GRDC investment addressing increased mouse activity in WA’s grainbelt. Image: GRDC

“In canola and legume crops, growers should be inspecting flowers and pods for damage. At the first sign of crop damage, growers need to be prepared to bait, preferably with 50g/kg zinc phosphide spread at 1kg/ha.”

Steve Henry, CSIRO

INTERSALES GROUP LEADS THE PACK WITH THE CROPSCAN 3300H ON COMBINE GRAIN ANALYSER.

Next Instruments trading as CropScanAg were one of 20 odd exhibitors at the CNH Industrial Connect Expo, held in the Gold Coast, Qld. The Expo is a conference for Case and New Holland dealers around Australia and New Zealand whereby they can catch up on the latest development in CNHi products and their partner company's technologies.

CropScanAg has been a partner with CNHi since 2016 under Supply Agreements whereby the CropScan 3300H and the N-GAUGE Apps, are distributed through the Case IH and New Holland dealers in Australia and New Zealand.

During the Expo, Adam Blachut, A director of Intersales, spoke with Phil and Mat Clancy, the owners of CropScanAg, about Intersales experiences with the CropScan 3300H analysers.

Adam commented that although there is potential for increasing revenues through blending based on Protein, the growers who have installed the CropScan on their combines in recent years, have found that the immediate benefit comes from the accurate Moisture readings. At harvest time, in central NSW, early morning and late evening dew in the air restricts the growers time that the harvester can be stripping grain. Users of the CropScan 3300H have found that they can strip early and later each day because the Moisture readings are so more accurate and reliable than capacitance moisture meters. Typically, growers are stripping for up to an extra 4 hours per day. That can equate to a 20-30% increase in harvest efficiency. Growers can reduce the labour costs, fuel cost, and get the crop before any spring storms hit. Adam commented that some growers pay for the CropScan 3300H in the first year after installation just based on improving harvesting efficiency.

In the Southern NSW region Intersales have installed more than 30 CropScan 3300H analysers since 2018. Amongst its clients, there is a group that participated in a Farmlink trial conducted by Eva Moffitt, Moffit Consulting, Young, NSW. Eva's report titled, "Utilising new technologies to better manage with-in paddock Nitrogen variability and sustainably close the Yield Gap in southern NSW." Eva's report showed that Protein was critical to the assessment of Nitrogen variability across the field, farms, and district. By combining Protein and Yield collected of the combine using the CropScan 3300H and the on-board Yield Monitor, Eva showed a high correlation between deep N and Protein. Protein/ Yield Correlation Quadrant maps from 6 farms in the Temora district reliably identified zones where Nitrogen had been the limiting factor in achieving the potential Yield for the fields. Using the maps, Eva established that the application of more Nitrogen into the zones where the Protein was low and the Yield less than optimal, resulted in a positive Yield response.

Intersales focus on Precision Agriculture throughout the group, sees that the CropScan 3300H is a valuable tool for growers and adding a CropScan 3300H a fantastic option when purchasing a new or used Case IH combine as well as existing machines. Intersales believe that building strong customer loyalty is based on providing real solutions that produce a positive revenue growth for their customers.

For more information on the CropScan 3300H go to our web site, www.cropscanag.com or call 02 9771 5444.

SPROUTX FEATURED IN STARTUP GENOME 2022 REPORT AS A KEY PLAYER IN THE AUSTRALIAN AGRI/FOODTECH ECOSYSTEM

It's not news that there is a clear need for innovation given the rapidly growing global population, disparity in access to food, soil degradation and greenhouse gas emissions. The urgency for innovative solutions became even more profound with COVID-19 pandemic, spiraling fertilizer costs, supply chain disruption, and recent geopolitical events. (For those outside the agri/food space, have you noticed that 1kg of broccoli at Coles is $9 at the moment?). Solution seekers across the world are filling the gap to feed the world and improve the sustainability of our agricultural systems through initiatives such as crop gene modifications, revamping logistics, or tapping into the plant-based food space and many of them need support in terms of access to market, communities and capital.

Cue Startup Genome, the world-leading policy advisory and research organisation for public and private organisations committed to accelerating the success of their startup ecosystem. Their mission is to accelerate startup success and ecosystem performance everywhere by working together with global thought leaders and practitioners to define and execute robust policies and programs that drive lasting change.

"The Global Startup Ecosystem Report: Agtech & New Food Edition" by Startup Genome is a comprehensive report covering the landscape of Agtech & New Food tech ecosystems and players around the world. All with a focus on improving agricultural efficiency and sustainability, including field, sensors, drones, farm-management software, robotics, vertical farming, and more.

Ecosystems provide a collaborative pathway to global success for research and startups and Startup Genome found that Australia is lagging behind the rest of the world with Sydney's ecosystem ranking at 21 while Melbourne's ecosystem ranking below top 30

The report highlights the need for investment into and structuring of a strong Agtech ecosystem in Australia in order to catch up with the rest of the world. The majority of the Top 10 Global Accelerators and Incubators are in North America. Similarly, the majority of the Top 10 Venture Capital Firms and Investors are in North America. North America and Asia dominate the top 25 Agtech & New Food ranking, with 48% and 20% respectively. Europe has four ecosystems in the top 25, Oceania has two, and MENA one.

SproutX is proud to be the only still-running Agri/foodtech Accelerator & Incubator listed in the report. We firmly stand by the call for greater agri/food tech ecosystem investment in Australia and are happy to see some recent attention towards the sector from awareness around climate change, alertness from food security/ supply chain issues from the pandemic, and very recently positive indicators on policies movement.

ECOSYSTEM	RANKING	TOTAL EARLY STAGE FUNDING ($BN)	ECOSYSTEM VALUE ($BN)
Silicon Valley	#1	22	1,029
New York	#2	10.2	189
London	#3	8.5	142
Sydney	#21	0.92	17.4

Comparison of top Agtech and New Food Tech ecosystems with Australian (Sydney's) ecosystem

ECOSYSTEM	RANKING	PERFORMANCE	FUNDING	STARTUP EXPERIENCE	KNOWLEDGE	TALENT	FOCUS
Silicon Valley	#1	10	10	10	7	10	4
New York	#2	10	10	10	3	6	3
London	#3	10	10	10	4	8	4
Sydney	#21	5	4	5	5	7	5
Melbourne	#31	5	2	1	3	6	7

(SproutX extract from pg. 19 of the report with a focus on Australian cities)

NEW GRANTS FOR VICTORIA HORTICULTURAL PRODUCERS

Victoria's horticulture industry will benefit from a Commonwealth Government funding boost that will support a new round of grants under the Horticulture Netting Program.

The Commonwealth Government is providing $11.2 million to expand the grant program, building upon an initial $4.6 million investment in 2021 for the first iteration of the program.

The new round of grants will be open to all eligible horticultural enterprises, excluding wine grapes, for the purchase and installation of new netting over established production areas.

Agriculture Victoria Executive Director, Policy and Programs, Sarah-Jane McCormack, said the grants are ideal for producers looking to future-proof their farms.

"The expansion of the Horticultural Netting Program provides a terrific opportunity for horticultural enterprises to receive support for installing netting infrastructure that will increase their resilience to adverse weather events and improve efficiency."

Agriculture Victoria will implement the grant program on the Commonwealth Government's behalf.

The grants (capped at $150,000) are available to eligible producers covering up to 50 per cent of the cost to purchase or install horticultural netting over commercial production areas.

Netting has been shown to deliver productivity benefits by protecting crops from extreme weather and predators and increasing water use efficiency.

"These grants provide valuable assistance to growers to increase productivity at a time where they are also bouncing back from the impacts of COVID on their businesses," Ms McCormack said.

Applications are now open and will close on 17 October 2022.

For more information on the Horticulture Netting Program or apply for a grant visit https://agriculture.vic.gov.au/netting

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