



THE LATEST PLANT SCIENCE INDUSTRY NEWS



Matthew Cossey
Chief Executive Officer, CropLife Australia

CropLife acknowledges the original farmers and custodians of the lands we live on.

From the CEO

'Natural' is a word often used to portray a product as sustainable, healthy or safe. In reality the hazard or safety of a chemical has no connection to whether it is naturally occurring or produced in a lab.

A cup of 'natural' apple seeds contains enough hydrogen cyanide (a naturally occurring substance) to kill an adult human. A clear illustration that natural does not automatically equal safe, just as synthetic does not mean dangerous.

There is however a 'Goldilocks dose' for every chemical naturally produced in food, used in agriculture and in our homes. Too little, too much and just right have three completely different effects on our bodies, on crop yield and the environment. Some chemistry can pose a threat to certain species and at the same time be completely safe, and indeed healthy for others. Lemon juice is a good example.

In agriculture, all pesticide chemistry (both organic and synthetic) is assessed and approved by the Australian Pesticides and Veterinary Medicines Authority (APVMA). The APVMA is a world-renowned, robust, rigorous and scientifically independent regulatory authority.

Over the last decade or more we have seen the development of extreme food fads and trends driven by falsely premised marketing and completely disconnected from science, attempting to warp Australian consumers' understanding of modern farming. This poses a follow-on threat to good public policy and regulation around farming. At a time when farming needs to further increase productivity and become even more environmentally sustainable, the new-age food trend 'snake oil' promoters who seek to mislead consumers through fear, need to be rejected.

A classic example is the consumer misunderstanding of organic, and its continual misuse. Organic food is objectively no safer or more nutritious or healthier than conventionally grown food and is certainly not more environmentally sustainable by any measure. While choice in the supermarket is a good thing, Australians must also ensure they are properly informed about their food. Australian consumers should make a conscious decision to support local and high-quality produce, not simply the farming system used.

A fresh approach to increasing fruit and vegetable intake

Pesticides enable affordable access to fresh fruit and vegetables for all Australians.



Fruit and vegetables would cost around **50% more** if farmers didn't have access to crop protection products that enable them to grow more food, more sustainably.



The health benefits of eating fresh produce far outweigh falsely perceived risks of pesticide residues.



Eating 4-5 servings of fruits and vegetables a day is linked to reduced risk of cardiovascular disease, type 2 diabetes, digestive diseases, cancer and stroke.



In Australia only **7%** of adults reach the recommended daily intake of vegetables.



Only **5%** of Australian children eat enough vegetables for optimal growth and development.



Whether organic or conventional fruits and vegetables contain the same amount of nutrients including fibre, carbohydrates, protein, vitamins, minerals and phytochemicals. So don't skip them!



Crop
PROTECTION

Crop Protection

Biopesticides: The intersection of chemistry and biotechnology

At the intersection of traditional chemistry and biotechnology lies an exciting advancement in the future of pest management: Double stranded ribonucleic acid (dsRNA).

dsRNA is like the traffic police for gene function. dsRNA is a trigger molecule that gives cells the ability to switch off the activity of genes and is crucial to a plant's development and defence mechanism against disease.

The discovery of dsRNA is providing new ways to protect plants from the pests and diseases that reduce global food production by up to 40 per cent. As new biosecurity threats emerge and resistance evolves, dsRNA is being harnessed as an impressively specific biopesticide that only targets the genes of a pest essential to its survival. This is the type of innovation that will be at the core of the fourth agricultural revolution.

Technologies using dsRNA are so precisely focused and targeted to a pest's gene that they are harmless to everything else around it, even closely related pest species. For farmers, it's a game-changer in pest management and environmental sustainability.

Next-generation technologies such as these are currently being developed at Australian universities and public research institutes like the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and global research centres. The challenge however is to develop a product that is shelf stable and active, that doesn't naturally break down before it is applied.

The future is here. Fostering investment into novel and effective pest management solutions such as dsRNA will continue to drive innovations that make a difference to farmers and the planet.



Australian scientists Ritesh Jain and Professor Neena Mitter trialling new dsRNA technology BioClay™ on silverleaf whitefly pest. Photo by Megan Pope UQ.

Introducing BioClay™

A new application technology has been developed by the University of Queensland to target silverleaf whitefly, one of cotton's most damaging pests. BioClay™ spray uses degradable clay particles that protect the dsRNA from degrading before it is applied. When applied, the dsRNA enters the plant and protects it without altering the plant's genome.

Research team leader Professor Neena Mitter said, "When whiteflies try to feed on the sap, they also ingest the dsRNA, which kills the insect by targeting genes essential to its survival."



Glyphosate in the media: Follow the science

As with the COVID-19 pandemic, Australians are looking for consistent and evidence-based science communication. Some of the recent media coverage about glyphosate trades the sheer weight of global data and research supporting the safety of glyphosate in favour of pseudoscience for clicks. It's important to know the facts, so here are some important ones.

Over the last 50 years, glyphosate has revolutionised farming practices around the world because of how effective and safe it is. Glyphosate is a broad-spectrum herbicide which works by inhibiting an enzyme unique only to plants needed to grow. It is completely safe for humans if minuscule amounts are consumed, does not bioaccumulate and is automatically excreted by the body.

Since the 16th century we have known that the mere presence of a chemical tells us nothing about its toxicity, for it is the dose and the concentration that counts. Modern science makes it possible to detect compounds at levels which are thousands of times below both safety thresholds and biological relevance. In fact, glyphosate has a lesser acute toxicity than table salt.

Decades of global peer-reviewed literature and every major independent science-based regulator has comprehensively evaluated glyphosate and arrived at the identical conclusion that glyphosate-based products are safe to use.

The great thing about science is that it's true, whether you believe it or not, even when it doesn't align with certain political or lifestyle trends. Rather than worry about residues of a thoroughly regulated product, let's stick to the facts and inform healthy food choices. Australians would benefit more from consistent science-based information that reflects the true safety of Australia's food production systems and the importance of eating more fruit, vegetables and wholegrains.

The world's most advanced, competent and independent regulators have scientifically assessed and reassessed glyphosate and declared it to be safe. These include:



United States Environmental Protection Agency



Australian Pesticides and Veterinary Medicines Authority



Health Canada



German Federal Institute for Occupational Safety and Health



New Zealand Environmental Protection Authority



European Food Safety Authority



European Chemicals Agency



Crop
BIOTECHNOLOGY

Crop Biotechnology

From humble beginnings to 10 years of gene-editing with CRISPR

They say the best solutions are often the simplest and the evolution of gene-editing is no exception. It has led us back to one of the simplest organisms on the planet – bacteria.

Science and innovation rarely creates something out of nothing, it takes direct cues from nature's own solutions to develop a 'technology'.

Just 10 years ago, scientists discovered that the naturally occurring mechanism of CRISPR-Cas9 could be used to develop a breakthrough gene-editing technique. Now faced with complex global problems like climate change, there's hope that CRISPR may pave new ways in addressing environmental and food production challenges.

CRISPR was first discovered as a natural immune response in bacteria, used as a genetic memory to help the cell detect and destroy viruses. In 2012, Dr Emmanuelle Charpentier and Professor Jennifer Doudna published a research article outlining how this mechanism could be harnessed as a gene-editing technology in plants and animals.

It allows scientists to read and 'snip' DNA at precise points, triggering cells to repair those breaks either randomly or by the incorporation of new genetic information.

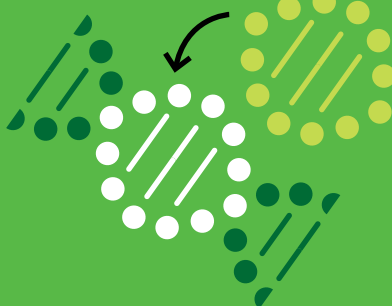
The ominous threat of climate change and its impact on food production has been all too clear over recent years. Droughts, floods, rising temperatures, salinity and biosecurity threats have transformed the environment in which agriculture operates.

In the not-too-distant future, CRISPR-based crop improvements like drought tolerance, disease management, improved yield and herbicide resistance will be a major step towards a more resilient and sustainable food supply.

The possibilities of CRISPR truly are endless and could solve real world problems from new therapeutic cancer treatments to environmental sustainability in crops. However, in order to realise them, fundamental research must be enabled through good regulation and public policy.

GMOs

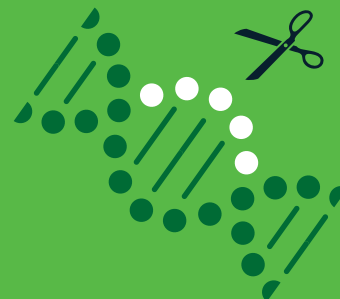
Technique: a foreign gene is inserted into the DNA strand.



Result: the crop takes on improved characteristics associated with the new gene and the genetic modification can be detected through tests.

CRISPR gene editing

Technique: gene is cut and its DNA is naturally modified during repair.



Result: the crop's DNA is changed, but tests can not distinguish the genetically engineered crop from traditional breeding techniques.



Implementing the Gene Technology Scheme: The Federal Department of Health's art of making the possible impossible.

In due course...

Australia has seen some major public policy achievements in the last few years, but an up-to-date regulatory framework for agricultural biotechnology is definitely not one of them.

At the appropriate juncture...

The 2017 Review of the National Gene Technology Scheme started as a routine assessment to ensure the current regulation of biotechnology meets its purpose and keeps up with advances in gene technology. After three rounds of public consultation, an Action Plan was produced in 2018, requiring (yes you guessed it) a further two rounds of stakeholder consultation before implementation. Since then, no meaningful progress has been actioned, lapsing well beyond implementation deadlines. It begs the question, have we been catfished by the Federal Department of Health bureaucracy?

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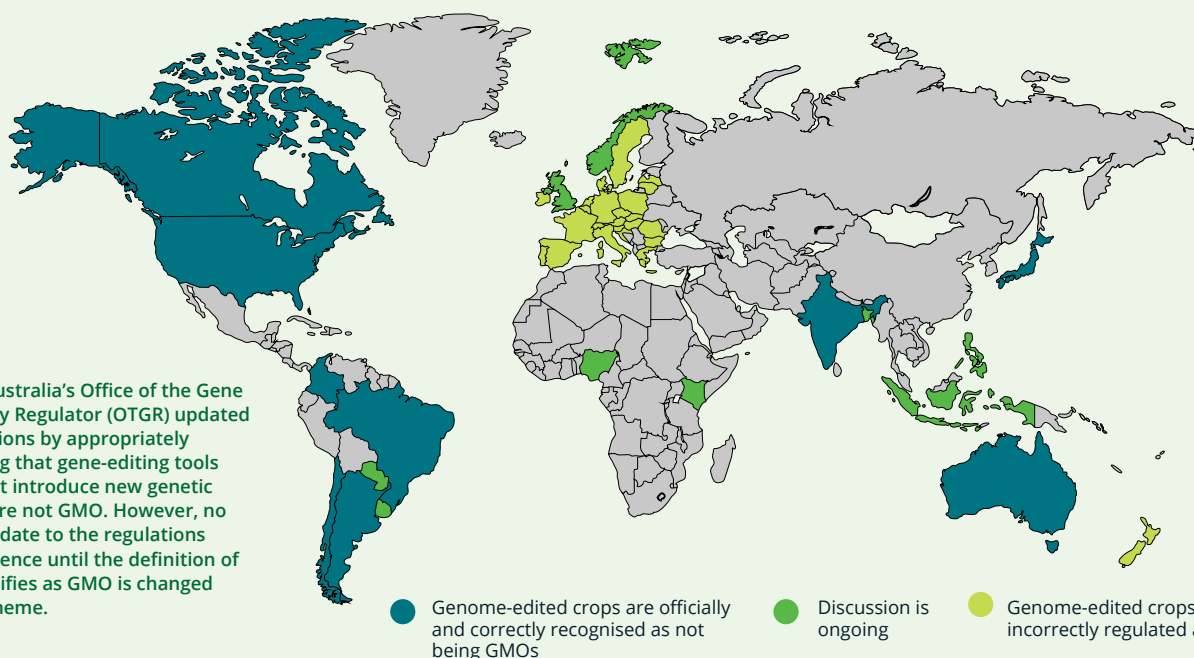
When all the necessary procedures have been completed...

Fit-for-purpose regulatory reform listens to scientific consensus as it evolves over time and the stakeholders who use it. Mere consultation for consultation's sake has made for good satire over the years but not good policy. Even Einstein said, "Bureaucracy is the death of all sound work". At this rate, current recommendations won't be implemented before another Review is due to start this year.

When the moment is ripe...

If implemented, the Third Review of the National Gene Technology Scheme presents an opportunity to remain a world-leader in biotechnology regulation and build sovereign capacity. This will not be achieved by an idle system that creates the very legislative stalemate it was established to avoid. Rather, a clear future-proofed system that keeps agricultural and medical innovations onshore will prepare Australia for the almost certain challenges we face but don't yet see.

What's in a "definition"?





Industry
STEWARDSHIP

Industry Stewardship

The buzz about pollinator protection

Australian scientists are working to develop a world-first, parasite-specific insecticide that is safe for honey bees but fatal to Varroa mite.

Australia has one of the healthiest honey bee populations in the world, but the agricultural industry has been on high alert since the parasite Varroa mite was detected at the NSW Port of Newcastle in late June this year. The recent removal of yellow notification zones is welcome news considering if not contained, an outbreak could cost industry and consumers up to \$1.3 billion over 30 years.

Pesticides are a critical tool for the containment of invasive species as part of frontline border security measures to protect Australia's natural biodiversity. Researchers from Sydney University and Hort Innovation are working to create a molecule that specifically targets the Varroa mite's hormone receptors, without interfering with beneficial or native insects when applied to bees in hives.

While the insecticide could still be at least two years away from commercialisation, the plant science industry has long invested in the development of more pest specific technologies that could assist with the surveillance, detection and management of existing pests and diseases already on our shores.

In partnership with the Australian Honey Bee Industry Council, CropLife and its members have long practiced pollinator monitoring and protection strategies through BeeConnected®.

The nation-wide, user-driven smartphone app communicates the location of hives and spray arrangements between beekeepers, farmers and spray contractors to facilitate best-practice pollinator protection.

CropLife Australia's Pollinator Protection Initiative also recognises the many other native insects that play a key role in pollination and food production. Its best-practice stewardship initiatives provide farmers and other product users integrated pest management strategies for ensuring pollinator protection beyond the honey bee.

StewardshipFirst®

The Pollinator Protection Initiative is part of CropLife Australia's StewardshipFirst suite of world-leading product stewardship initiatives, programs and best-practice guides.

Ensuring pollinator protection beyond the honey bee

Did you know

that many wild insects are important pollinators too?

Pollinator Protection Initiative 

Flies
many flies have hairy bodies that are great at moving pollen between flowers. Some flies, like Syrphids, can carry just as much pollen as honey bees!



Moths
Some moths faithfully pollinate certain plants like fruit crops or orchids. Pollination by moths is likely highly underestimated because insects are challenging to study at night.



Wild insects
Wild insects pollinate many crops better than honey bees – visits from wild insects increase fruit set more than honey bee visits. Non-bee insects are more resilient to land use change, and can serve as pollination 'insurance' against honey bee losses.



BeeConnected® was a world-first initiative by CropLife Australia in partnership with the Australian Honey Bee Industry Council.



Australia has one of the healthiest honey bee colonies in the world. BeeConnected® helps farmers and beekeepers work together to protect bees for the benefit of Australian agriculture and the environment.

BeeConnected® allows farmers to easily log their crop protection spray activities and beekeepers to log the location of their beehives. When a beehive is logged near a farmer's property, both are sent an instant notification allowing them to chat further about their activities via a secure internal messaging service.

An initiative of



in partnership with



Find more information about this and other industry stewardship initiatives at stewardshipfirst.com.au



Innovation: Where stewardship begins

For hundreds of years plant science has been searching for answers and creating new possibilities. How do we feed a growing population with fewer resources? Can we find better ways to help plants survive the threat of pests, disease, drought, flood, wind and climate change? The answer to these challenges begins with Research and Development (R&D).

The goal of R&D in the plant science industry is to continually improve the range and quality of its crop protection products so they are biologically efficient, environmentally sound, safe and easy to use and economically viable.

Investment in R&D in Australian agriculture is more than \$3.3 billion each year. With this, new knowledge in areas such as chemistry, biology, field data science and biotechnology is creating more effective and sustainable products and informing world-leading stewardship practices.

Every year, about 10 new compounds come onto the market. In every decade, one or two totally newer and safer chemical classes are discovered. But beyond new active ingredients, industry delivers continuous innovation through improved formulations, application methods and delivery mechanisms.

Innovation distinguishes between a leader and a follower

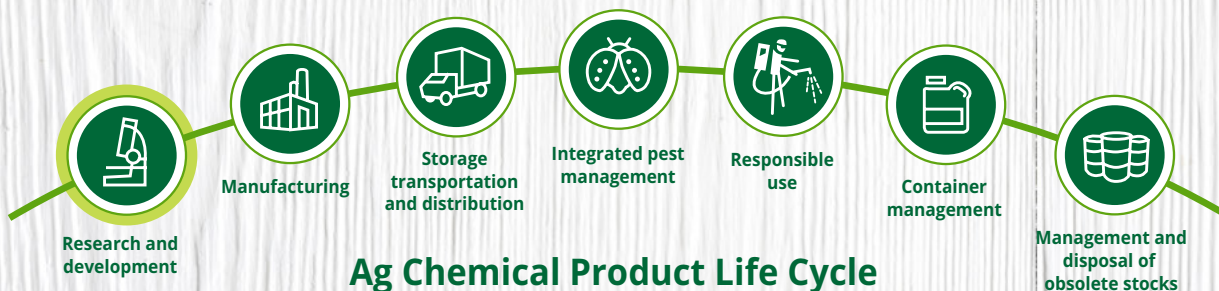
Research improvements in IT innovation and GPS technology have transformed the efficiency of application equipment used on farm. These practical innovations are just one example of how precision agriculture is enabling more targeted application of pesticides where they are needed and minimising risk of spray drift and resistance.

Step change innovation in plant science R&D doesn't just exist in the lab. Thought leadership, technical knowledge and a stewardship mindset that draws on traditional knowledge and local wisdom about the unique Australian landscape and environmental challenges is critical. Where stewardship is at the core of R&D, long-term solutions will continue to support both agricultural productivity and environmental conservation.

Leapfrogging innovation in pesticide stewardship

Several different formulations of glyphosate have been developed through the R&D process to suit different environmental conditions.

One special aquatic formulation was developed for safe weed control around water without posing a risk to frogs.



Ag Chemical Product Life Cycle



ChemClear® assists farmers in disaster declared areas

The ChemClear® flood run campaign was launched in June as a co-ordinated response by CropLife Australia's wholly owned subsidiary Agsafe, the NSW Environment Protection Authority (EPA) and the Queensland Department of Environment and Science.



As part of Commonwealth-State Disaster Recovery Funding Arrangements, more than 9,000 litres of impacted agricultural chemical has been removed from flood affected properties in NSW and Queensland.

NSW EPA Executive Director Stephen Beaman, said, "The recent floods caused widespread devastation across Northern NSW. In some instances, agricultural chemicals such as fertiliser and pesticides were moved or damaged by the floodwaters."

"This ChemClear® campaign is designed to enable the safe and secure removal of flood impacted agricultural chemicals from farms and out of rural communities at no cost to people who register, to help reduce any potential environmental impact," Mr Beaman concluded.

Since the ChemClear® program was established in 2003, almost 800 tonnes of obsolete, expired or damaged agvet chemicals has been removed from rural communities.

agsafe.org.au

A taste of country at the National Wine Show



The nation's sharpest palates: NWS wine judges.



Participants sampling some of Australia's best wines at the National Wine Show of Australia.

Despite a challenging few years for Australian winemakers, the future is bright. The breadth and depth of classes at this year's National Wine Show was a true indication of Australian winemaking resilience and skill.

Fires, hail, trade challenges, storms, unseasonal frosts, fluctuating summer rainfall and the resultant disease pressure are part and parcel of the everyday challenges the industry has faced. However, the nation's grape and wine sector has not faltered, adapting and innovating in clever ways to produce some of the world's best and most exciting wines.

As a sponsor of the National Wine Show, CropLife Australia and its members are proud to support and celebrate Australian viticulture that contributes \$45.5 billion to the Australian economy and represents nine per cent of all agricultural exports.

Fungicides provide critical control of diseases like powdery mildew which can trigger the rejection of entire crops at seemingly miniscule levels: just three per cent infection. The plant science industry is proud to support thousands of Australian grape growers and wine makers who are renowned for consistently delivering the highest quality grapes from prestigious regions with rich histories. This interplay between science, agriculture, climate and skill is what makes custodianship of Australian viticulture so dynamic and impressive.



NWS Panel Chair of Judges, David Bicknell with Sutton Grange Winery's, Chris Smales.

Congratulations to all the finalists and winners along with CropLife Australia's special guest, Sutton Grange Winery. Its 2019 shiraz took out the Prime Minister's Trophy and the James Halliday Red Wine of Show on the night. A wine that tastes of country. Grown, made and typifying the concept of Australian terroir.



Master of Ceremonies Mark Beretta.



NWS Committee Chair, Andy Gregory.



A perfect pairing

The best of the plant science industry proudly supporting the best of Australian viticulture.



CropLife members' news and events



Drawing attention to farm safety

In partnership with #PlantASeedForSafety

The Syngenta 'Colour Between the Lines' colouring-in competition was launched in partnership with #PlantASeedForSafety during National Farm Safety Week in July. The competition reinforces health and safety messages like the importance of keeping agricultural chemicals safely stored and locked away in a well-ventilated area. plantaseedforsafety.com/comp-syngenta.com.au



Nufarm Australia has partnered with Active Farmers to build stronger and more resilient farming communities. Active Farmers is providing over 200 fitness classes a month across 50 or more communities Australia-wide. The program hopes to address the prevalence of mental health issues in the bush through activity, connection and health and wellbeing. nufarm.com.au



Bayer has partnered with Goanna Ag to expand cotton water use efficiency in Australia and beyond. The project will deliver Goanna Ag's GoField PLUS technology to 300 sites each year for three years. The technology uses field data and an analytics platform developed by CSIRO and the Cotton Research and Development Corporation to help growers optimise irrigation scheduling. bayer.com.au



Sumitomo Australia has showcased its research facilities in Japan to Australian staff and customers. The groups were taken to the Takarazuka R&D centre in Tokyo and the Kansai Research farm to see some of the early-stage discovery research in action. sumitomo-chem.com.au



The Australian winner of Corteva's Climate Positive Leaders Program in 2021, Jake Ryan, attended the Global Farmers Network event in Frankfurt, Germany last month. Jake met with farmers from around the world to discuss a range of topical issues and what farmers can do to resolve them. corteva.com.au



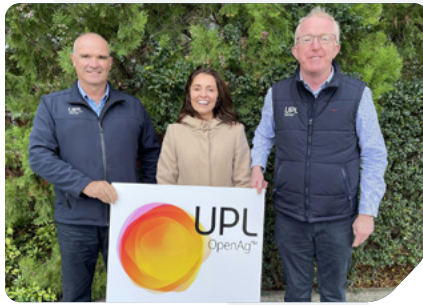
Nutrien Ag Solutions Community Grants Program is offering grants of up to \$5,000 for projects across rural and regional Australia. After the stress of COVID-19, the program aims to get communities back on their feet without relying on face-to-face fundraising. nutrienagsolutions.com.au



ADAMA has celebrated the 2021 winner and finalists of the ADAMA Chris Lehmann Young Cotton Achiever of the Year award. Congratulations to winner Emma Ayliffe from Summit Ag for her contribution to improved effectiveness and sustainability in the cotton industry. adama.com/australia



Elders have led a panel session at the 2022 Australian Cotton Conference about increasing productivity of raingrown cotton. The speakers included private consultants, CSIRO and industry technology providers. The investment in the session was designed to address innovations that achieve better outcomes for the dryland component of the Australian cotton industry.
elders.com.au



UPL has committed a new Platinum sponsorship in support of Victoria's Longerenong Agriculture College. UPL invested in the college as it is reliant on a successful agriculture industry, which contributes over \$60 billion to Australia's GDP. The industry's continued strength relies on the skill set of its workforce and building the skill set of the Agricultural workforce for now and into the future.
upl-ltd.com



Sipcam Australia is the latest company to join WeedSmart as a partner organisation. WeedSmart partners help spread the very important messages of weed management to ensure long-term sustainability of herbicide use is at the forefront of global farming practice.
sipcam.com.au



Georgia Griggs
Sales Agronomist at E.E Muir & Sons



Savannah Coddington
HR and WHS coordinator at Delta Agribusiness

Congratulations to Georgia Griggs and Savannah Coddington as recipients of the FMC 2022 LEAD Scholarship Program. Valued at \$12,000 each, the scholarships contribute towards leadership and management training for aspiring agricultural leaders. FMC hopes the investment helps to build capacity for a skilled agricultural workforce.
fmccrop.com.au



Over 700 primary school students from years 4 – 6 recently spent a day as a scientist at Curtin University's Bentley Campus. For over 15 years, the BASF Kids' Lab ignites children's interest in STEM (Science, Technology, Engineering and Math). The next program will be held at Curtin's WA School of Mines at Kalgoorlie.
basf.com.au



FBN's Community Builders held over 65 community events in rural and regional towns across Australia's broadacre cropping regions during the pre-harvest period. Community Builders include co-operatives, grower groups and small businesses independent of FBN that empower farmers to make the right decisions on crop protection and nutrition inputs.
fbn.com



CropLife Australia is the national peak industry organisation representing the plant science sector in Australia.

CropLife's members are the world-leading innovators, developers, manufacturers and formulators of crop protection and crop biotechnology products. The plant science industry, which enables more than \$20 billion a year of Australian agricultural production, provides products to protect crops against pests, weeds and diseases, as well as developing crop biotechnologies key to the nation's agricultural productivity, profitability and sustainability. CropLife is part of the plant science industry's 91 country international federation.

Representing the best of the plant science industry



To find out more visit: croplife.org.au



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