



CropLinks

THE LATEST PLANT SCIENCE INDUSTRY NEWS

Tackling food loss and waste through plant science

A safe and stable food supply became a national talking point during the first few weeks of the COVID-19 pandemic.

As anxious Australians filled their trollies and purchased additional freezers for food storage, the agricultural sector was reminding them that Australia's food production system is so strong that three quarters of what is produced by our farmers is above our needs and able to be exported.

Even in a food-secure nation like Australia, there is room for improvement. Pests, weeds and diseases continue to be major threats to the production, profitability and sustainability of Australia's farming sector, leading to food loss. At the other end of the spectrum, Australia wastes more than five million tonnes of food to landfill each year.

On a global scale, the picture is more grim. Drought is a major contributor to food loss when crops are in the field. Between 2006-2016 drought accounted for 83 per cent of all global crop losses. Looking specifically at the developing world, up to 50 per cent of all crops succumb to pests, crop diseases or post-harvest losses.

Food is also lost between the harvest and consumer stages due to issues like inadequate storage or transport logistics. Losses in this stage vary significantly by region – in central and southern Asia, it's as high as 21 per cent while at just six per cent in Australia and New Zealand.

Food loss would be even higher without the innovations of the plant science industry. Herbicides, fungicides and insecticides continue to provide the world's crops with vital protection against insects, diseases and weeds during production and harvest. Without them, global crop losses could as much as double each year.

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CropLife
Australia





THE LATEST PLANT SCIENCE INDUSTRY NEWS



Matthew Cossey
Chief Executive Officer, CroLife Australia

From the CEO

The paradigm shift in normal life triggered by the COVID-19 global pandemic has seen significant changes and challenges across all sectors, not least of which was global trade disruptions. Ironically here in Australia we saw panic buying of basic food items at the same time as many of our farmers across the country were finally having favourable growing conditions for the first time in many, many years.

Amidst these extraordinary circumstances and challenges of supplying crucial farm inputs, fee increases for the Australian Pesticides and Veterinary Medicines Authority (APVMA) were announced.

These APVMA fee increases will be borne by the farming sector – just when they are finally getting some decent rainfall and giving their all to produce the food, feed and fibre requirements of the nation.

With 73 per cent of the total value of Australia's crop production enabled by crop protection products, Government must be very cautious of any possible inhibitors to products making it to the Australian market for our farmers to access. While Australia is in the fortunate position of having a world leading farming sector that produces essentially all of the country's food requirements (and then also able to export about three quarters of production), governments of all levels, and the community more broadly, should not take it for granted.

The most recent performance statistics of the APVMA show that performance has improved to almost meeting the minimum statutory requirements across the board and the APVMA is to be commended for that. However, this improvement should highlight that adding any ill-considered and poorly planned addition layers of bureaucracy, such as a \$600,000 a year governance board, should not be done outside of a comprehensive reform package that will deliver real step change improvement in performance.

The agricultural sector needs to be assured of genuine gains in timeliness and efficiency in operations of the regulator from any reforms, especially ones that come with costs that Government is not meeting. It is reasonable to expect more than just meeting the minimum statutory timeframes considering the APVMA has now received an ongoing significant boost in revenue being paid by the plant science industry and the nation's farmers.

Tackling food loss and waste through plant science (cont from page 1)

Over \$20 billion of Australia's total agricultural output is attributable to and enabled by pesticides. Biotech crops help to prevent pre-harvest losses by protecting against threats such as diseases and pests which can cost farmers 60-80 per cent of their yield in some regions.

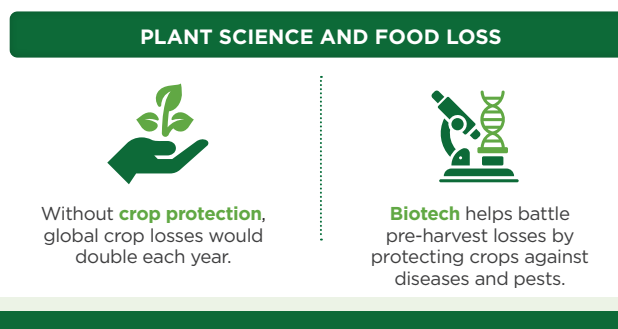
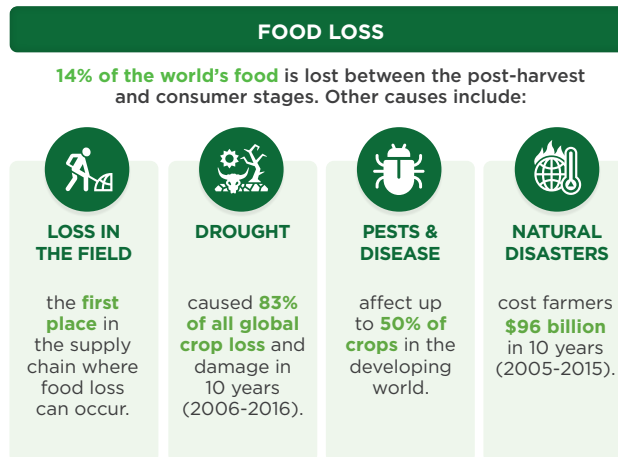
The produce that is not lost through pests, weeds, disease and drought is still not immune to being wasted. Food waste contributes to about eight per cent of global greenhouse gas emissions and can cause as much damage to our planet as plastic waste. Food is wasted for cosmetic reasons like size, shape or colour, by consumers who misunderstand "best before" labels and general overbuying. During the COVID-19 pandemic it is estimated food waste has more than doubled due to restaurants being closed with that produce unable to be redirected to consumers.

Governments around the world are tackling the issue of food waste through the UN Sustainable Development Goal of halving food waste by 2030. These efforts have a strong ally in the plant science industry. A great example is Arctic Apples. Developed using CSIRO technology by a Canadian company and now released in the US, these gene-edited apples essentially eliminate browning and are therefore less likely to be thrown away, cutting food waste. It's an ideal solution in nations where consumer demands for the "perfect" fruit and vegetables means that half of all produce is thrown away.

... If nations truly embrace the power of plant science, they will find a wealth of ways to contribute to global food security

This is just the beginning. If nations truly embrace the power of plant science, they will find a wealth of ways to contribute to global food security. The need to work together on global solutions has never been as important than in these uncertain times.

Governments around the world have committed to **halve food waste by 2030** as part of the UN Sustainable Development Goal: Responsible Consumption and Production.



Crop Protection



Protecting a safe and secure global food supply

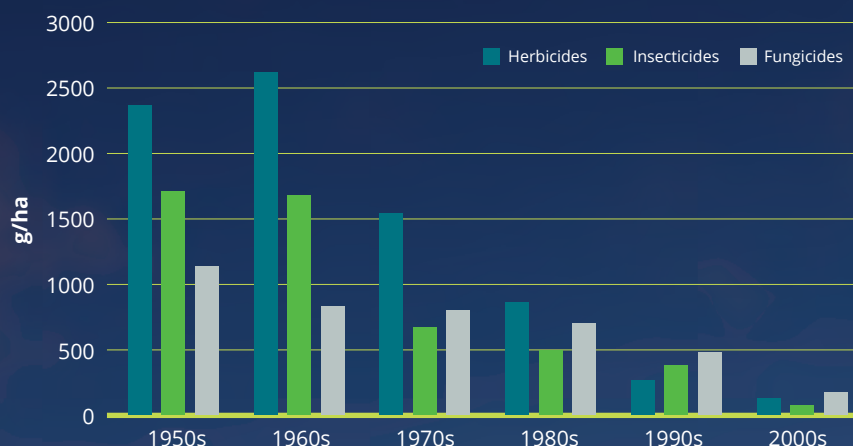
Crop protection products – developed with human and environmental health as priorities – provide farmers with carefully tailored tools to produce safe, healthy and abundant crops.

Since the 1950's, the plant science industry has achieved an astonishing 95 per cent decrease in the average application of insecticides, herbicides and fungicides while other advances have seen safer crop yields more than triple. This is a positive trend in the fight against food-borne sicknesses.

Thousands of hours of research and development and scientific assessment by both industry and then regulators go into ensuring crop protection products, when used according to label directions, present no unacceptable risk to users, consumers, animals or the environment.

The latest crop protection products are enabling farmers to produce more food per unit of land than ever before. With a rapidly changing climate and a growing population to feed, the need for even more effective crop protection products is more vital than ever.

Average active ingredient application rates over time



Source: Phillips McDougall

Plant science innovation facts

37%

No-till farming enabled by crop protection products and GM crops has reduced carbon release by approximately 37 per cent since the 1970's.

1/3

It takes about one-third the amount of land to grow the same amount of food as it did in 1961.

45%

In the last 50 years the number of managed honeybees worldwide has risen by 45 per cent.



CropLife's BeeConnected app connects beekeepers and farmers to facilitate best-practice pollinator protection.

2-30

The number of insect species is thought to be between 2 and 30 million.


BeeConnected™



Dr. Rattan Lal
Leading soil scientist

Leading soil scientist Dr. Rattan Lal has been announced as the 2020 World Food Prize Laureate.

His work focussed on developing and mainstreaming a soil-centric approach to increasing food production that conserves natural resources and mitigates climate change. Dr. Lal's innovative research demonstrates how healthy soils are a crucial component of sustainable agricultural – enabling higher crop yields, while requiring less land, reduced on-farm inputs, water and energy.

His work has been pivotal in enhancing the productivity and sustainability of global agricultural systems, resulting in improved crop yields and food security, while also saving hundreds of millions of hectares of natural tropical ecosystems.

New report sheds light on agriculture's relationship to insect populations

The past few years have seen an increase in misleading media stories blaming modern agriculture for a reported "insect apocalypse". Now, a wide-ranging study* by German researchers is shedding light on these "insect apocalypse" claims.

Researchers at the German Centre for Integrative Biodiversity Research, Leipzig University and Martin Luther University have analysed almost a century of data from 166 long-term insect surveys from across the globe.

Their key findings show terrestrial insects are declining much less rapidly than other studies had suggested and freshwater insect populations are increasing. In stark contrast to sensationalised media reporting, crops like corn, soybeans, sorghum, cotton, wheat, alfalfa and hay, are associated with increases in insect populations.

The team of German researchers' finding that farmland actually contributes to increased insect populations flies in the face of headlines calling out modern agriculture, including the use of synthetic pesticides and GM crops, for causing the purported declines. As these insect population increases apply to existing farmland only, agricultural technologies that increase yield – therefore eliminating the need to clear more farmland – only further the prospects of insects.

Attempting to feed the growing world with only low-productivity food systems like organic and pesticide-free could have devastating impacts on the environment. Shunning no-till farming (chemical weed control rather than soil ploughing) with its proven sustainability benefits would almost certainly result in the conversion of forests, grasslands and other habitats into farming cropping and pasture, resulting in habitat destruction for insects.

As agriculture relies so heavily on bees and other insects for pollination, their health remains front of mind for the plant science industry when developing the next agricultural innovations.

*van Kling *et al.* (2020). Meta-analysis reveals declines in terrestrial but increases in freshwater insect abundances. *Science* 368.

The research shows that the only clear association with insect declines is with urbanisation, likely caused by habitat destruction and pollution.



Crop Biotechnology



Crop
BIOTECHNOLOGY

Regulating game-changing technology

How are gene-edited crops regulated around the world?

Legislation and regulation of genome-edited crops is evolving rapidly across the globe to adapt to and keep pace with the new technology.

Genome-editing is a revolution for plant science, agriculture and innovation. The ability to easily and quickly produce plants with precise, targeted changes is a game-changer for the entire agricultural sector.

A recent report* compares the way countries have adapted their biosafety legislation to this emerging tool. The Southern Hemisphere, with the exception of New Zealand, has taken a science-led and future-facing approach. Argentina was the first country in 2015 to declare that genome-edited crops would not be regulated if they do not contain foreign DNA. This was followed by Chile, Brazil and Columbia.

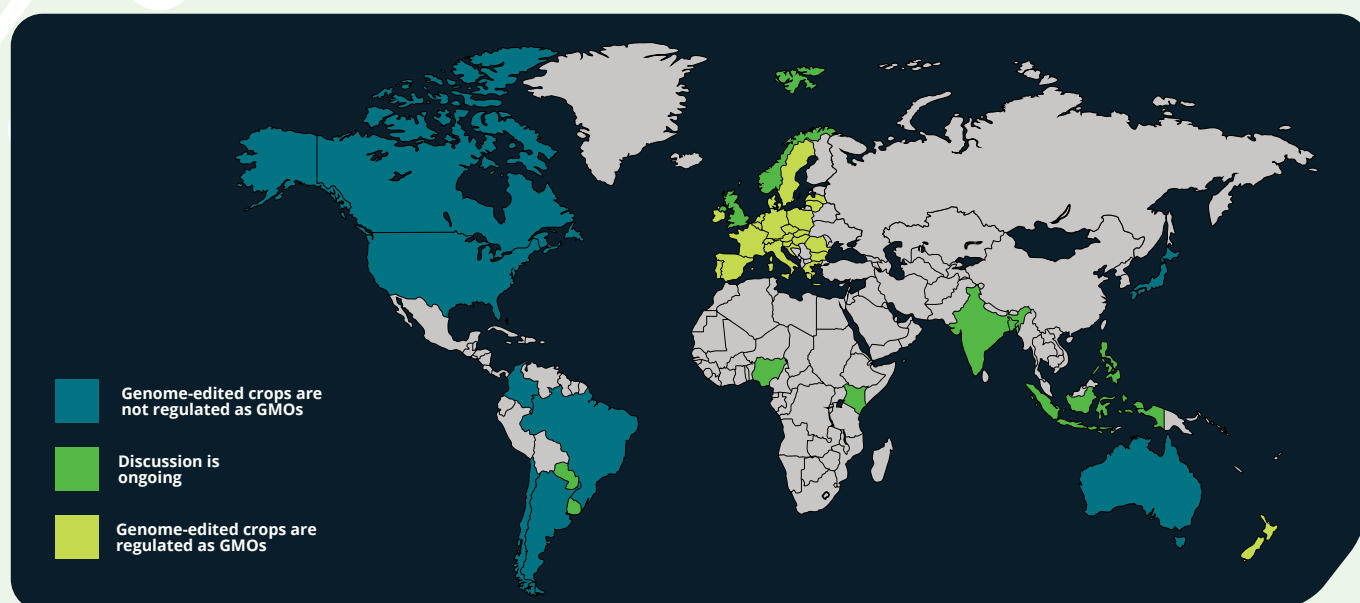
In Australia, genome-editing applications that do not use a DNA template to guide the repair are now excluded from regulation, a first step towards futureproofing our regulations.

In contrast in Europe, the EU Court of Justice declared in 2018 that all genome-edited organisms are genetically modified and must continue to be regulated as such.

This decision has had a profoundly negative impact on researchers and farmers, locking them out of technological advances. In response, several agricultural companies have moved their breeding programs out of Europe. Governments such as Switzerland, Norway and the UK are considering new laws to ease approval for genome-edited products.

The development of new policies for genome-editing crops is an important and encouraging step for innovation and the plant science sector. Evidence-based regulatory systems will lead to the development of a wider range of products and benefits for global agriculture.

*Schmidt, S. M., Belisle, M. and Frommer W. B. (2020). The evolving landscape around genome editing in agriculture. **EMBO Reports**.





Bacterial blight is a threat to rice production in Asia and West Africa, leading to massive yield losses and putting the food supply and income of smallholder farmers at risk.

Researchers from the International Rice Research Institute (IRRI) recently used CRISPR-Cas9 to edit the rice genes that are hijacked by the bacteria at the early stages of infection.

The genome-edited rice lines showed broad-spectrum resistance to the disease in the field. These encouraging preliminary results show the crucial role genome-editing can play in improving crops for those who need them most.

Science or science fiction? Perceptions of genome-editing on social media

Love it or hate it, social media plays an important role in the way people learn about and view technology and innovation. A recent study* sheds light upon how agricultural and environmental genome-editing is perceived and discussed by social media users.

The authors focussed on Facebook comments on news articles related to genome-editing published across 11 news outlets. Interestingly, most commenters were not interested in the shown science or debating facts. Rather, three main groups emerged. Those that used science as a tool to shame others, those that disregarded the science based on their personal beliefs, and those that interpreted science through a sometimes-humorous science fiction lens. These distinct groups essentially speak different languages about the same issue.

The findings show that using only scientific arguments while communicating about genome-editing may only speak to users who already see the topic through a scientific lens. Those who process the topic through conceptions of nature or beliefs may be put off if shamed for their perceived unscientific views. The authors describe being aware of a scientific elitism in debates as a key lesson for productive discussions.

References to humour and science fiction, the study suggests, might be a way for people who are ambivalent to cope with the topic. Therefore, communication about genome-editing should avoid scientific media hype not to feed into perceptions of biotechnology as a funny, science fiction-related, fantastical topic.

*Brittany Walker & Jennifer Malson (2020): Science, God and Nature: A Textual and Frequency Analysis of Facebook Comments on News Articles About Agricultural and Environmental Gene Editing. **Environmental Communications**.

GM cropping gets the green light in South Australia

After a political breakthrough, the South Australian Parliament has granted farmers on the state's mainland access to GM crop innovations from next season.

The South Australian Government and Opposition found agreement on the way forward to enable commercial GM crop cultivation on mainland South Australia through a compromise involving local council areas.

The agreement will see local councils (excluding Kangaroo Island which will remain GM cultivation free as part of the legislation) have a six-month window to make a formal request to be a GM crop cultivation free area. Councils will have to consult with primary producers in their area and apply to the Minister for Primary Industries and Regional Development who will have the final say.

Councils will only be able to remain GM cultivation free if they can prove a specific trade and/or marketing advantage. Upon receiving an application, the Minister will consult with independent experts through the GM Advisory Committee before deciding whether the council will receive an exemption. There is no evidence to suggest any local council should receive such an exemption.

GM crops have been enabling farmers in other states and around the world to improve yields, reduce carbon emissions, use natural resources and pesticides more sustainably and protect the soil through no-till farming for decades. GM crops are beneficial for farmers and the environment. Now farmers on mainland South Australia will have access to this crucial agricultural technology.

Industry Stewardship



Industry
STEWARDSHIP

A bin born from rubbish

Single use plastics given a second life

Half of all plastic containers and products are designed to be used only once, before being thrown away. While the discourse in urban Australia around single use plastics may be dominated by plastic bottles, straws and shopping bags, farmers are fortunate to not be faced with an additional dilemma: What to do with empty agricultural and veterinary (agvet) chemical containers.

drumMUSTER, a recycling program of CropLife Australia's stewardship initiative, Agsafe, has recycled upwards of 40,000 tonnes of agricultural plastic waste that would otherwise have been sent to landfill, buried or burned on farms.

For over 20 years, **drumMUSTER** has been transforming plastic waste into useful, sustainable products like wheelie bins, fence posts and garden stakes. In March this year, **drumMUSTER** celebrated its 35 millionth agvet chemical container collected, an important milestone for one of Australia's oldest product stewardship schemes.

According to the 2017-18 Australian Plastics Recycling Survey, only seven per cent of agricultural sector plastics are recovered. Of that seven per cent, **drumMUSTER** is responsible for recycling approximately half, meaning that 50 per cent of all ag plastics recycled in Australia are done so through the program's 800 collection sites.

Agsafe was formed by CropLife Australia in 1993 as an industry-led non-profit organisation, following a product stewardship commitment by the member companies of CropLife. The purpose: to ensure safe supply, use and disposal of agvet chemicals and containers across the supply chain.



Container recycling around the world

Agricultural chemicals play a vital role in controlling the pests, weeds and diseases that threaten our global food supply. The CropLife international network is leading the safe and responsible management of used pesticide containers. Since 2005 container recycling and management programs have been established in 58 countries. The network has collected close to 730,000 tonnes of plastic.

Brazil

The container management program **CAMPO LIMPIO** has collected more than 453,000 tonnes of empty packages. In 2018 40,200 tonnes were collected and 93% of the plastic collected was recycled.



Tackling on-farm resistance

CropLife Australia has recently released its 2020 Resistance Management Strategies for fungicides, herbicides and insecticides. The strategies – reviewed by scientific technical review committees in consultation with relevant national and international experts – assist farmers, agronomists and environmental land managers to ensure important crop protection products remain an effective tool.

The Resistance Management Strategies are part of CropLife's broader StewardshipFirst program, a suite of world-leading stewardship initiatives that assist all pesticide users in maintaining best-practice.

Visit croplife.org.au/resistance-management to find out more!



South Africa

The container management program lead by **CROPLIFE SOUTH AFRICA** collected almost 5450 tonnes of plastic in 2018, 70% of all plastic containers placed on the market. 95% of the plastic collected was recycled.



France

In 2018 the program **ADIVALOR** collected 70,000 tonnes of plastic used in agriculture. Up to 90% of the plastic collected was recycled.



Canada

The container management program **CLEANFARMS INC.** has collected more than 6 million plastic containers. 100% of the plastic collected was recycled.



Australia

The program **drumMUSTER** has collected and disposed of more than 35 million plastic containers. **drumMUSTER** has saved \$33 million in landfill costs.

News and events



Healthy bee populations for sustainable pollination in horticulture, a project led by Western Sydney University and supported by Bayer, is entering its fourth year of research and analysis. The project is part of the Hort Frontiers Pollination Fund and aims to support existing introduced and native pollinators and identify the most effective pollination methods for various horticulture crops, while ensuring the responsible use of crop protection products. Preliminary findings from the research are already being adopted by many of Australia's largest horticultural companies.



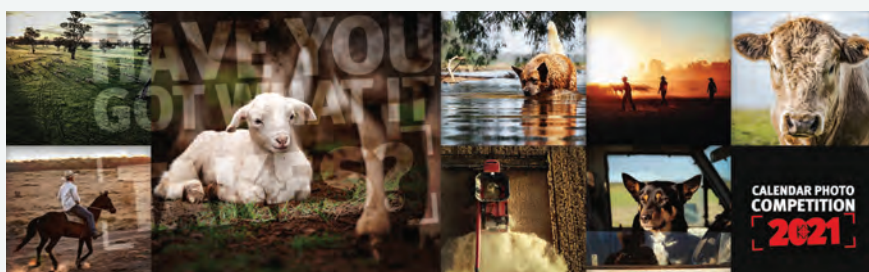
In response to the COVID-19 outbreak, Nufarm has continued its commitment to supporting Australian farmers. Nufarm have taken extensive measures to safeguard their people and production and introduced new ways to keep operations running and continue to get product to customers. Through utilisation of technology, training and consultations, and webinars have remained available to Australian farmers.



BASF together with Nutrien Ag Solutions have joined forces in a show of support for country football in WA, with 500 footballs to be distributed across 89 Western Australian Country Football Clubs.



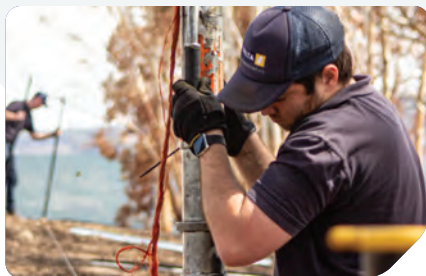
As Gold Partners of the Active Farmers Games, Corteva Agriscience staff put their commitment to work, competing at the event in Temora, New South Wales. Held in early March – prior to social distancing restrictions – the event aims to raise awareness of the importance of physical & mental health for farmers and to promote community connectedness.



The iconic Elders Photo Calendar Competition was held with the 2020 theme of Australian Agriculture Moments – capturing different aspects of our iconic landscape, commodities and people. The annual competition provides a platform for rural and regional communities to showcase their beautiful images. Don't forget to grab a copy when it's on sale later this year to see the winning shots!



ADAMA Australia is proud to partner with The Blue Tree Project as part of its Because Community Matters campaign, to help raise awareness of mental wellbeing in rural communities across Australia. With some communities currently more isolated than ever due to COVID-19, it's even more important to check in on those around us and help breakdown the stigma associated with mental health. Visit bluetreeproject.com.au to find out more.



FMC Australasia was a proud sponsor of the Purchase a Post initiative earlier this year. The initiative raises funds for fence posts and contractors to help rebuild farming communities that were devastated by fire in the Adelong, Batlow, Talbingo and Tumbarumba areas in New South Wales.



UPL has awarded Disruptive Packaging and its Uniqcor product as the winner of the 2020 virtual Tech Innovation Awards. Disruptive Packaging has developed an innovative compound that is changing the way we package fresh produce. Made from 70 per cent natural earth materials, Uniqcor can be used multiple times in the value chain and can replace crates, cartons, pallets, corner angles and even produce bins.



Agriculture's resilience has been tested by COVID-19, making fighting climate change even more vital than ever. Syngenta has announced new Good Growth Plan commitments to reduce agriculture's carbon footprint and help farmers deal with climate change. Under the new Good Growth Plan, Syngenta is accelerating its innovation to provide solutions for farmers. The target is to invest \$2bn in sustainable agriculture breakthroughs by 2025 and to deliver two sustainable technology breakthroughs each year.



Poster Competition

The safe disposal of agvet chemicals isn't the only thing **drumMUSTER** regional consultants are focused on – they are just as committed to teaching the next generation the importance of agricultural product stewardship.

WA Regional Consultant, Graeme Passmore, recently held a poster competition for the children at Narembreen Primary School and the results were nothing short of impressive. Well done to all the creative and talented students that participated in the competition.

CropLife Australia

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.

CropLife represents the best of the Australian plant science industry



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