



CropLinks

THE LATEST PLANT SCIENCE INDUSTRY NEWS

SPRING EDITION 2017

Do you know what it takes to produce your daily cup of coffee?

Coffee is one of the world's most widely consumed drinks. A wake-up call and social drink, it can also get you through a busy day or a long night.

There are two types of coffee grown worldwide — Arabica and Robusta — only Arabica is grown in Australia. Cultivated since 600AD, Arabica is thought to be superior to Robusta varieties and usually commands double the price.

As a nation of coffee connoisseurs, Australians tend to prefer the Arabica bean and according to World Atlas data, Australia is ranked 42nd in the world for coffee consumption at more than 3kg per capita.

The International Coffee Organization estimated that 8.9 billion kilograms of coffee was produced worldwide in the 2015–16 coffee year (October to September). The top two coffee producing countries, Brazil and Vietnam, produce 40 and 20 per cent of the global coffee supply respectively.

The global popularity of coffee is clear, but the crop is under constant threat from weeds, pests and diseases such as coffee leaf rust, coffee borer beetle and root-knot nematodes. Coffee leaf rust affects quality and quantity, reducing harvests by 40 per cent or more.

Without the important farming tools and innovations provided by the plant science industry world coffee production would be significantly reduced.

Can you imagine a morning without your coffee? Thanks to the plant science industry and the hard work of farmers, you don't have too.

#internationalcoffeeday



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Science and innovation more important to food production than ever before

From the Chief Executive

Australian farmers, like their farming colleagues around the world, are facing the huge challenge of feeding a rapidly growing global population, nearly 10 billion by 2050 and more than 11 billion by 2100, according to the most recent United Nations estimates. In simple terms, the world needs to produce as much food over the next 20 or so years as it has over the last 17,000 years of human existence.

Modern farming, using both crop protection and agricultural biotechnology, along with a range of other innovations, does and will play a crucial role in food, feed and fibre production in Australia. The world would lose about 50 per cent of its total current crop production if farmers didn't have access to the latest pesticides.

According to a 2013 study by Deloitte Access Economics, titled *Economic activity attributable to crop protection products*, Australian farmers wouldn't be able to commercially produce a vast array of food crops such as tomatoes, grapes, apples, potatoes, lettuce, rice, strawberries and many more without these crucial chemical crop protection products.

A recent International Service for the Acquisition of Agri-Biotech Applications report titled *Global Status of Commercialized GM/Biotech Crops: 2016* reinforced the growing importance of agricultural biotechnologies for the safe and sustainable production of food. It noted that over the last 20 years crop biotechnology had delivered significant benefits for farmers, consumers and economies. However, it also highlighted the need to ensure non-science based and

unnecessary regulation doesn't prevent Australia from reaping the benefits of, and being a world leader in, innovation.

For Australian agriculture to remain competitive and environmentally sustainable while facing climate challenges and production and resource constraints, it must be free to embrace modern farming technologies.

It is important for Australian farmers to have confidence in their access to these safe, effective modern agriculture innovations to maintain and improve on their position as global agriculture leaders. It is imperative that public policies and regulations for modern farming technologies are based on facts, evidence and science and that the misinformed anti-science activist groups stop seeking to unduly influence agricultural policy with myth and hysteria.

The global plant science industry invests billions of dollars each year on research and development into innovations in modern cropping to help farmers to farm productively and more environmentally sustainable than ever before.



Aussie cotton grower shares benefits of biotech



GM cotton grower Ben Dal Broi with his family on their property in Griffith, NSW.

GM cotton grower, Ben Dal Broi, recently represented Australia at the 11th Pan-Asia Farmers Exchange Program, in Manila, Philippines. The program brought together 63 participants from 11 countries across Asia.

Attendees learned about plant biotechnology and its benefits, the importance of science-based and functional biosafety regulatory framework, and the different agricultural and biotech status and experiences of attending countries.

In sharing his experience of the program, Ben said he learned a lot about how other countries are using or hoping to use the benefits of genetic modification (GM).

“Those farmers fortunate to have access to biotech crops have only had access approved in recent years. While the technology has helped them vastly improve their food security, communities and incomes, strong stewardship practices are required to help protect the technology from the development of resistance,” said Ben.

After spending 17 years away from the family farm for schooling, university and work, Ben and his young family returned to farming on a 440-hectare property next to his parents own GM cotton farm near Griffith, NSW. The combined family farm is 1,000 hectares under irrigation. Ben’s father has grown GM cotton for five years.

“Economically, GM cotton makes sense for our family farming enterprise with

good commodity prices available and favourable water allocations,” he said.

“We have experienced first-hand the benefits of using GM cotton, including reduced off-target damage from chemical spraying and with better weed control, a reduced need for cotton chippers to remove weeds. These benefits are good for the environment, my family and workers, and it saves time and money.”

Ben states that one of the biggest challenges in growing GM cotton is that there is a lot more onus on stewardship for the grower. “The importance of stewardship in managing the longevity of the technology cannot be understated,” said Ben.

Without the availability of GM cotton, the Dal Broi’s admit they would not have considered cotton for their farm.

Ben says that his experience with the cotton industry has been extremely positive. He credits the industry’s professional and supportive approach from researchers, seed technology developers, agronomists, policy advisers and ginner for his successful experience. “It feels like a community where everyone wants you to succeed,” he said.

GM COTTON FACTS

- 1 More than 99 per cent of the Australian cotton crop relies on GM varieties:
 - 94 per cent of the 2015 crop had both herbicide tolerant and insect resistant ‘stacked’ GM traits
 - nearly all of the remaining 6 per cent was GM herbicide tolerant only.

- 2 From 1996–2015, GM insect resistant and herbicide tolerant cotton generated an additional \$1.28 billion in net income for for Australian cotton growers.

- 3 In absolute terms, the use of insecticides (per hectare) on GM insect resistant cotton has fallen by nearly 90 per cent compared to the levels of use on conventional cotton crops in the mid-1990s.

- 4 Between 1996 and 2015, the widespread adoption of GM insect resistant cotton resulted in 31.9 million fewer spray runs on cotton crops, a saving of 26.8 million litres of fuel and a reduction in greenhouse gas emissions of 71.5 million kilograms of CO₂.

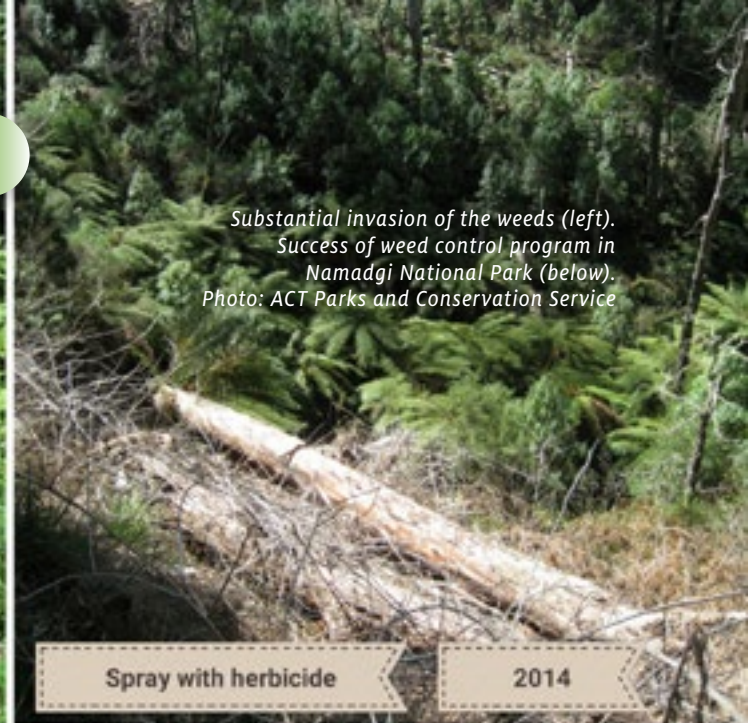
Source: Brookes G 2016, *Adoption and Impact of GM crops in Australia: 20 years’ experience*. Report prepared for CropLife Australia Ltd, Canberra, May 2016.

Crop Protection



Blackberry invasion

2011



Spray with herbicide

2014

*Substantial invasion of the weeds (left).
Success of weed control program in
Namadgi National Park (below).
Photo: ACT Parks and Conservation Service*

Protecting Australia's precious natural environment



Native plants return

2017

Australia is known globally for its breathtaking national parks and beautiful native flora. It is a country whose picturesque environment is adored by local and international visitors alike, with millions of people each year flocking to explore national parks and nature reserves around the country.

In a great example of environmental conservation targeted weed control, the ACT Parks and Conservation

Service have used the tools of the plant science industry to successfully control the spread of blackberries in the wet sclerophyll forests of the northern area of the Namadgi National Park.

While we all love blackberries in fruit salad, in the pristine environments of national parks the blackberry bush can spread rapidly if not controlled, destroying the native flora and compromising the natural ecosystem.

The plant science industry provides Australia's environmental land managers with the innovative tools that

are crucial to controlling invasive weeds and insects throughout Australia's world renowned national parks. These tools are also used for public parks, golf courses, gardens, and to even control weeds alongside roads and buildings, pathways and public infrastructure.

Without the use of a range of specialised pesticide products and the hard work of park rangers, spray contractors and other environmental land managers, grassy ecosystems such as in the Namadgi National Park in the ACT, would succumb to the significant threat of invasive weeds.

Crop protection products defending truffles against truffle hungry pests and weeds

From Manjimup in the west to Tasmania in the south and Victoria, the NSW Southern Highlands and the region surrounding the Nation's Capital there is an exciting new crop being grown — truffles! Through the cold wintery months, we also saw truffle mania in many of the nation's leading restaurants.

What is a truffle?

Truffles are fungi but unlike mushrooms that grow above ground and spread their spores on the wind to propagate, they have evolved to keep the spores inside a protective skin and depend on animals to dig them up to enable propagation.

Like the majority of crops in Australia, truffles need the defence of crop protection products in order to survive in an environment of truffle loving pests and nutrient robbing weeds. These pests include truffle beetles and slaters and are a significant issue for Australia's expanding truffle industry.

The Australian Truffle Growers Association estimates that in 2020 Australia will produce 20,000kg of truffles — almost double current production levels. Therefore, it is essential for growers to have strong pest and weed management strategies in place to ensure that Australia can capitalise on the global truffle market.

To date, truffles have been harvested in Australia at Manjimup in WA, in northern Tasmania, in the Yarra Valley, the Otways and parts of Gippsland in Victoria, the ACT and in the NSW Highlands from Jindabyne to Moss Vale and out to Oberon, Bathurst and Orange.



Map of truffle cultivation in Australia.



CropLife Australia @CropLifeOz



#dyk: Specially developed **herbicides** that deactivate in soil and don't impact on truffle mycorrhiza are crucial to **truffle production**.

3 FACTS ON TRUFFLES

- 1 Truffles are a form of mushroom that grow in harmony with a host tree (oak and hazelnut), enabling the tree to take up phosphorus while in return the truffle receives sugars enabling it to grow.
- 2 Truffles grow underground, about 25–100mm down, on the roots of certain varieties of oak and hazelnut trees.
- 3 While there are edible truffle varieties that grow almost all year round, the season for culinary quality black and white truffles is in winter.

A stronger and more productive agriculture sector

The Productivity Commission's final report on the Regulation of Australian Agriculture found that meeting the challenges of sustainable food production in a rapidly growing world requires science-based regulatory policies that support all farming production systems, including existing and future farming innovations.

GM crops are just another step along the same path of technological innovation that led to Australian agricultural inventions such as the combine harvester and 'Federation' wheat varieties.

The utilisation of these innovations has delivered safe and affordable food to the nation and the world. Despite a proven record of safety, every GM crop is subjected to intense global scrutiny.

Government regulators around the world have independently reached the conclusion that the cultivation of GM crops is as safe for human health or the environment as the cultivation of conventional (non-GM) varieties. More importantly, it is agreed that they are a necessary and vital tool in meeting the global food and nutrition security challenge.

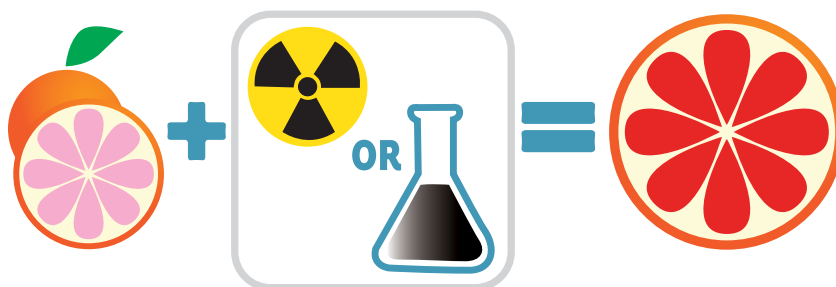
GM crops currently under research and development in Australia and around the world will help Australian farmers to combat environmental stresses such as drought, acid soils and salinity. There is also considerable Australian research into GM traits that will bring health benefits to consumers, such as healthier starches and oils modified to be lower

Crop modification is more than just GM

Did you know that the seedless watermelons and the ruby red grapefruits that have lined the shelves of your local supermarkets for years are the result of conventional breeding techniques, a whole different process of crop modification? These conventional breeding techniques are not genetic modification and therefore are not regulated in Australia.

The red grapefruit

Deep red 'ruby' coloured grapefruit is achieved through a process called mutagenesis, which is the use of chemicals or radiation to generate random mutations, some of which may have desirable characteristics.



Source: *The Official Australian Reference Guide to Agricultural Biotechnology and GM Crops*, 3rd ed.

Plant breeders are constantly looking for new and more precise ways of exploiting genetic variation to discover characteristics that are desirable to both farmers and consumers alike. Today, a range of new plant breeding innovations are available that allow breeders to more precisely make improvements in plant varieties.

The evolution of plant science now allows breeders to make specific changes in existing plant genes in a way that mimics the changes that could occur in nature.

in saturated fats and with improved cooking qualities.

The Productivity Commission found that the remaining Australian state moratoria on commercial cultivation of GM crops lacked a sound policy justification and recommended they should be repealed or allowed to expire. The Commission also found no policy justification for the mandatory labelling of GM foods.

Crop biotechnologies, like crop protection products, are crucial to modern farming and it is essential that government works with industry to reduce unnecessary regulatory 'red tape' that is not commensurate with risk.

Creating nationally harmonised regulations and legislation to improve Australian farmer access to the latest innovative tools in plant science should be a priority for all governments.

Scientists plan to future-proof agriculture in Australia

THE STRATEGIES

- 1** The Australian Government to establish a national agricultural research translation and commercialisation fund.
- 2** The partnership of the academic, industry and government sectors to create a doctoral training and early career support centre for the agricultural sciences.
- 3** The agricultural research community to engage strongly with infrastructure planning processes to enable agricultural research to benefit from, and contribute to, shared national capabilities.
- 4** The Australian Government to consider reviewing and updating the arrangements for national coordination of agricultural research and innovation in Australia.
- 5** All organisations in the agricultural sector to do more to understand and effectively engage with the public on social acceptance of agricultural science.

To successfully identify, develop and deploy a new generation of game-changing scientific advances, such as genomics and metabolic engineering, investment in research and innovation is essential.

Australia's leading agricultural scientists have released a 10-year strategic plan which aims to future-proof Australian farmers against looming shocks like climate variability and major disease outbreaks.

The 10-year plan, developed by the Australian Academy of Science's National Committee for Agriculture, Fisheries and Food, outlines five key strategies that will capitalise on emerging technologies and improve the strength and efficiency of agricultural research in Australia.

To ensure ongoing innovation, coordination and efficiency in Australia's agricultural sector, a strong strategic direction is essential.

To read the strategies in full visit www.science.org.au

GLOBAL STATUS OF COMMERCIALISED BIOTECH/GM CROPS IN 2016



185.1 MILLION HECTARES BIOTECH CROPS IN

26 COUNTRIES PLANTED BY

18 MILLION FARMERS

FASTEST ADOPTED CROP TECHNOLOGY IN RECENT TIMES

DEVELOPING COUNTRIES GREW MORE BIOTECH CROPS

19 DEVELOPING COUNTRIES
99.6 MILLION HECTARES

7 INDUSTRIAL COUNTRIES
85.5 MILLION HECTARES

185.1 MILLION HECTARES

BIOTECH SOYBEAN
REACHED **50%** OF
GLOBAL BIOTECH
CROP AREA IN 2016



3 OF THE TOP 5 BIOTECH GROWING COUNTRIES
ARE DEVELOPING
(production in million hectares)

1	USA	(72.9)
2	Brazil	(49.1)
3	Argentina	(23.8)
4	Canada	(11.6)
5	India	(10.8)

Source: Adapted from ISAAA and PG Economic report.

CropLife Australia's updated, user-friendly *Seed Treatment Stewardship Strategy* out now

Seed treatments are an excellent example of how the seed and crop protection industries provide Australian farmers with pioneering tools to deliver better outcomes for Australian agriculture.

Seed treatments act as a delivery mechanism for pest and disease management products to improve crop production and yield opportunities. They are specifically tailored to meet farmers' pest and disease control needs while minimising risks to health, safety and the environment.

The second edition of CropLife Australia's *Seed Treatment Stewardship Strategy* includes four specific stewardship and best practice guides. These outline measures to reduce risks from dust generated during handling and planting of treated seed, and provide guidance on industry best-practices to minimise off-target movement of pest and disease management products.



The Strategy complements existing strategies for treated seed stewardship like those developed by AgriFutures Australia. Download for free at www.croplife.org.au

Resistance Management Strategies are crucial for effective farming

As pests, weeds and diseases continue to be major threats to Australia's natural environment and agricultural productivity, it is crucial that farmers continue to use crop protection products sustainably and manage resistance.

Resistance is an issue both in Australia and worldwide and can occur in as little as three to four years if no attention is paid to resistance management. This makes the adoption of an effective

resistance management strategy for chemical crop protection products vital to the long-term viability and profitability of Australian farming.

Making best-practice resistance management advice freely available is part of the commitment of CropLife Australia and its members to world-leading industry stewardship initiatives.

Each year CropLife updates and makes available Resistance Management Strategies for crop protection products specifically for Australia. They are

developed by a range of scientific technical review committees in consultation with relevant national and international experts.

These Resistance Management Strategies are part of CropLife Australia's StewardshipFirst program, which is a suite of world-leading stewardship initiatives that aim to assist all pesticide users in maintaining world's best-practice use.

The 2017 Resistance Management Strategies are available at: www.croplife.org.au.

drumMUSTER ...every container counts



drumMUSTER celebrating 30 million-milestone

CropLife Australia member companies and Australia's farmers continue to prove their worth as environmental champions, with the collection of the nation's 30 millionth agvet chemical container by Agsafe's **drumMUSTER program. Agsafe is CropLife Australia's internationally recognised and awarded stewardship organisation.**

The container recycling management program has already saved councils an impressive \$31 million in landfill costs, by diverting empty, clean containers towards recycling schemes since 1999, providing chemical users with an affordable, accessible way to dispose of unwanted drums.

It is only by collaborative efforts that Australia's oldest product stewardship program continues its success, with

814 collection sites operated by 350 councils and more than 100 other collection agencies nationwide.

Dookie Lions Club near Shepparton, Victoria, is one community group put under the spotlight for the 30-million celebrations, helping **drumMUSTER** mark its major national milestone at a recent community event.

The club, operational for 44 years, has collected 40,000 drums since 2013, raising \$10,000 towards a public fitness station operating in Dookie.

"The **drumMUSTER** program is great for community groups like us as the funds go straight back into the local area and it's great to see the environmental benefits," said club member and **drumMUSTER** inspector, Peter McManus.

"People understand that by working with **drumMUSTER** we help farmers

keep their farms clean and seeing what we've achieved, the club wants to keep going."

As an extension to **drumMUSTER**, ChemClear operates a collection service for unwanted agvet chemicals in each state and territory through an online booking service.

For more information on all of Agsafe's programs go to www.agsafe.org.au.



Feast on facts: New documentary sets the record straight on GMOs

How do we ensure that our food supply is safe, and that everyone has enough to eat?

How do we feed the world while also protecting the planet?

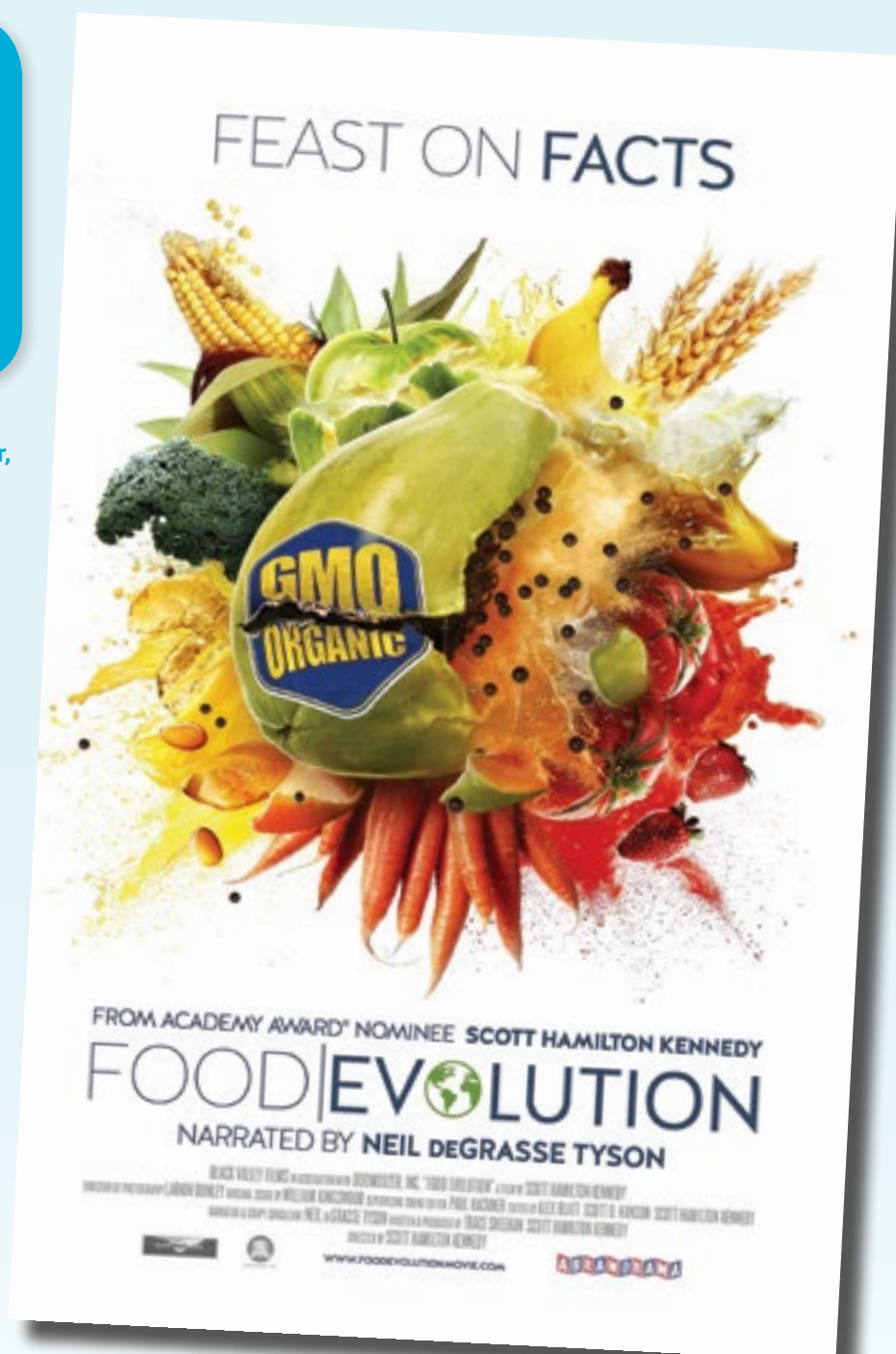
Most importantly, what evidence, data and sources are we using to approach these crucial questions?

In a new documentary released this year, Food Evolution explores the question behind one of the most misunderstood scientific advances of our generation.

Food Evolution, explores the controversy surrounding GMOs and food. Traveling from Hawaiian papaya groves, to banana farms in Uganda to the cornfields of Iowa, the film, narrated by esteemed astrophysicist and science communicator Neil deGrasse Tyson, wrestles with the emotions and the science driving one of the most heated debates of our time, GM crops.

While all the passionate advocates in the film are concerned with the stewardship of safe, nutritious food for the planet, their differing views over what constitutes the truth have pit them against each other, rendering the very subject of food itself into an ideological battleground.

Food Evolution is a documentary that separates hype and emotion from science and data to unravel the debate around food, and help audiences reach their own conclusions that are based on scientific facts. Universities across Australia have hosted special screenings of the documentary which is now available on demand at the Australian iTunes store.



Food Evolution shows how easily misinformation, confusion and fear can overwhelm objective analysis.



Bayer, together with Belgian young farmers' association partners Groene Kring (GK) and Fédération des Jeunes Agriculteurs (FJA), hosted 100 bright young minds, including three Australians hailing from NSW, at the third Youth Ag-Summit in Brussels from 9–13 October 2017. This year's summit was themed "Feeding a Hungry Planet", and aims to address the UN Sustainability Goals of ending hunger, achieving food security and promoting sustainable agriculture. The Youth Ag-Summit is part of Bayer's Agricultural Education Program which aims to raise global awareness about farming and food supplies.



Nufarm is proud to celebrate its achievement of a number of significant safety milestones. Within Australia, in June 2017 the company's Raymond Road, Victoria insecticide and fungicide manufacturing facility recorded 1,500 days worked without a lost-time injury (LTI). In further good news, Nufarm reached a company-wide milestone in August of 1.2 million hours worked without a LTI. Peter O'Keeffe, Nufarm ANZ Regional General Manager said "these achievements are validation of the investment and focus we are placing on safety within our business".



Dow AgroSciences

The Dow DuPont global merger has met key milestones with regulatory approvals from the EU, USA, China, Brazil, Australia and Canada. Proposed major remedies were widely accepted and the merger closed in August 2017. Dow AgroSciences is also pleased to announce that Enlist corn will be commercially available in the US and Canada for the 2018 growing season following China's approval to import grain from Enlist corn. Enlist corn is tolerant to novel 2,4-D and glyphosate formulations which provide options for weed control with short plant back and substantially reduced risk of off-target effects from drift.



Ten agriculture students from leading universities across Australia and New Zealand have recently participated in a two-week immersive study tour of Vietnam, as part of the 2017 Syngenta Connections program.

Syngenta Connections seeks to engage and inspire the next generation of agricultural leaders. During the study tour, the students visited growers in the Mekong Delta to gain insights into the challenges they face and learn about the role stakeholders play in supporting farmers and improving food security in the region.



FMC has announced that under the terms of an internal agreement effective 1 November 2017, FMC will acquire DuPont's Cereal Broadleaf Herbicides and Chewing Insecticides portfolios.

In addition, FMC will acquire the DuPont Crop Protection research and development pipeline and organisation, excluding seed treatment, nematicides, and late-stage R&D programs.



ISK Oceania has announced that Gerry Shepherd, General Manager of ISK Biosciences Oceania is retiring and will be replaced by Robert Harborne. Robert has spent many years in various positions in agricultural businesses including agricultural chemicals, animal health products and fertilisers and brings a wealth of experience to the position. He joins ISK at an exciting period with a number of novel chemicals in the pipeline.

NEW MEMBER CROP BIOTECHNOLOGY

Nuseed Pty Ltd joined the best in the plant science industry by becoming a proud member of CropLife Australia.

Nuseed develops plant traits and top performing canola, sorghum and sunflower hybrid seeds that create new markets and shared value chain opportunities. Started in 2006, Nuseed now has sales and advanced trials in approximately 30 countries. It is a wholly owned subsidiary of Nufarm Australia Limited.



CropLife Australia is the peak organisation representing **the best** of Australia's plant science and crop protection product companies.

CropLife ensures world's best stewardship and responsible use of the industry's products through its conduct of conduct and has set a benchmark for industry stewardship through initiatives in the StewardshipFirst™ program such as **drumMUSTER**, ChemClear, Agsafe Accreditation and Training and the Pollinator Protection Initiative.

That is why you can have full confidence when dealing with a CropLife member company.

CropLife represents Australia's **leading** innovators, developers, manufacturers, formulators and registrants of crop protection and agricultural biotechnology products.

CropLife Australia is part of the CropLife International Federation, representing the plant science sector in 91 countries around the world.

accensi



ADAMA

Arysta
LifeScience

BASF
We create chemistry



Dow AgroSciences



FMC



MONSANTO



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