



Advancing Sustainable Agriculture in Australia

Baseline Report 2017



Bayer is committed to partnering with likeminded stakeholders to proactively contribute to a sustainable future for agriculture in Australia.

Consumer interest in the ethical treatment of farm animals and concerns over the impact of climate on the future of Australian agriculture are examples of issues regarding sustainability that continue to feature in headlines. It is for this reason that the concept of sustainability has grown to become a function of business and a key consideration in the decision making of top companies.

Businesses have now put sustainability strategies in place and prepare annual reports on their performance in the same way they would report on their financial performance.

At Bayer, sustainability is directly linked to the viability of our business partners, and consequently to our own business success. As such, sustainability forms an integral part of our business strategy.

This report from Bayer in Australia documents the sustainability projects we are undertaking across the Australian agriculture sector. It outlines Bayer's priority projects that address sustainable agriculture and animal welfare.

The report details how each initiative contributes towards achieving the United Nations Sustainable Development Goals (SDGs) and demonstrates Bayer's support for the global SDGs from an Australian context.

This report is intended to provide a baseline for continued reporting over time.

“Long term sustainability in agriculture can only be achieved when economy, environment and society are given equal rank of importance.”

Richard Dickmann

Head of Public & Government Affairs ANZ

Sustainability – a definition

The term ‘sustainable development’ was defined by the Brundtland Commission of the United Nations on 20 March 1987 as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

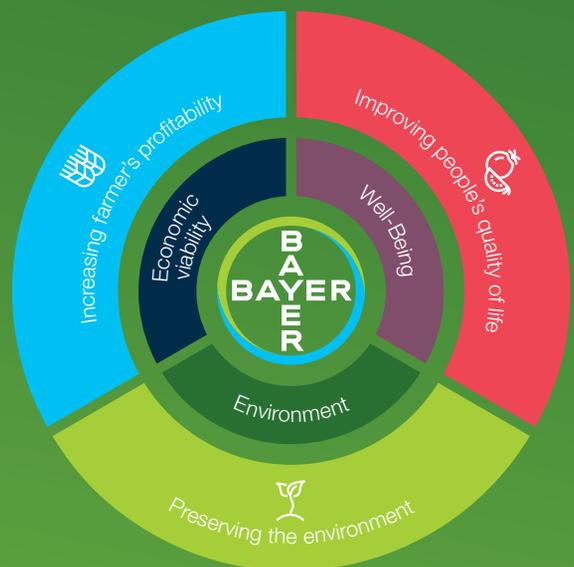
The ‘triple bottom line’ is a concept first coined in 1994 by John Elkington as a way for businesses to report on their sustainability performance. The idea was that in addition to reporting on the financial bottom line (“profit account”), a business should report on their social impact (“people’s account”) and their environmental impact (“planet account”).

The triple bottom line therefore comprises three measures of the performance of a business: people, planet and profit. In 2015, countries around the world adopted the United Nations 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.

Bayer explicitly supports the UN’s comprehensive approach to the SDGs. As a global life science company, our innovations, products and services make a direct contribution to overcoming some of the biggest global challenges, resulting from the growing and ageing world population.

Sustainable agriculture

The Crop Science division of Bayer is committed to sustainable agriculture as the best approach to overcome global challenges in agriculture. To us, sustainable agriculture means increasing farmer’s profitability, improving people’s quality of life and preserving the environment whilst creating shared value for business and society.



Bayer's global business focus aligns with the UN Sustainable Development Goals

Zero hunger and sustainable agriculture

With our core competencies in seeds, traits, crop protection and services, Goal 2: Zero Hunger which aims to achieve food security and promote sustainable agriculture, is closely aligned with Bayer's global mission. Feeding a growing population from increasingly scarce arable land is a global challenge for the agriculture industry. Land must be cultivated to boost yields and quality but also in an environmentally and resource-friendly manner. Bayer firmly believes that responsible use of targeted technologies is key in addressing these challenges.

Good health and wellbeing

Bayer's Crop Science and Animal Health activities in agriculture support direct outcomes in health by providing affordable, nutritious and sustainably grown food. By meeting the world's food security needs and underpinning correct nutrition, Bayer's agricultural activities help maximise community health outcomes.

Industry, innovation and infrastructure

Bayer is deeply committed to innovation across all its fields. Innovation is the key driver for better outcomes necessary to meet the significant challenges of the future: population growth, climate change and ageing.

Partnerships for the goals

Partnerships with private and public stakeholders play a decisive role to establish initiatives promoting sustainable agricultural measures and achieving food security. Bayer is engaged in a wide range of partnership projects both at global and country level to strengthen sustainable agriculture and to contribute to Goal 17: Partnerships for the Goals.



Agriculture

Crop Protection
Seeds
Services
Animal Health

Consumer Health

OTC medicines
Dietary supplements
Dermatology products
Foot care & Sunscreen

Pharmaceuticals

Innovative
Prescription
Medications



17 Partnerships
for the goals

Food

Health

2 ZERO
HUNGER



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



3 GOOD HEALTH
AND WELL-BEING



Sustainable agriculture initiatives of Bayer in Australia

Zero hunger and sustainable agriculture

Minimum tillage support for Australian broadacre cropping
Bayer has launched a number of initiatives to help farmers maintain and expand their minimum tillage practices.

Integrated pest management in brassica vegetables
The Brassica Integrated Pest Management project was developed to allow growers in Australia a sustainable way to control diamondback moth while providing safety to beneficial insects.

Bee and pollinator health
The bee and pollinator health project targets research and education for bee keepers and farmers.

Quality education

Agricultural Education Program
Bayer supports a number of youth agriculture science education and career development programs through various partnerships.

Life below water

Project Catalyst - Great Barrier Reef protection
Project Catalyst is a multi-stakeholder initiative to reduce the environmental impact of sugarcane production on water quality in the Great Barrier Reef Marine Park.

Phytobac®
The Phytobac system can reduce point source contamination from spray rig loading and wash down areas, a potential source of contamination for the scarce and valuable water bodies in Australia.

Responsible consumption

Pain relief – Tri-Solfen® from Bayer
Tri-Solfen reduces the pain and stress caused by some necessary animal husbandry procedures.

drumMUSTER – crop protection product container management
drumMUSTER is an industry led initiative to collect, store and recycle crop protection product containers.

ChemClear – crop protection product waste management
ChemClear is an industry led initiative to collect and safely dispose of unwanted crop protection products.

Bayer contributes to eight of the Sustainable Development Goals with a major focus on Goal 2: Zero hunger and sustainable agriculture, Goal 8: Responsible consumption and production and Goal 17: Partnerships for the goals



Figure: Bayer Australia's contribution to the SDGs in 2017. The numbers next to the circle indicate the number of initiatives that contribute to the corresponding SDG.

SUSTAINABLE DEVELOPMENT GOALS





Bayer is a member of the Sustainable
Agriculture Initiative Platform of Australia.
www.saiplatformaust.org

Phytobac[®], and Velocity[®] are Registered Trademarks of the Bayer Group Tri-Solfen is
a Registered Trademark of Animal Ethics Pty. Ltd
Sakura[®] is a Registered Trademark of Kumiai Chemical Industries Co. Limited

March 2018

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*Overview of initiatives of
Bayer in Australia*

CASE STUDIES



Zero hunger and sustainable agriculture

Minimum tillage support for Australian broad-acre cropping: Supporting integrated weed management

Arable land is critical for crop production and, thus, essential for securing food security. Recent widespread adoption of sustainable tillage practices has helped reduced wind and water erosion and maximise water use efficiency. However, the over reliance and incorrect use of certain herbicides in a minimum tillage system has created resistance problems in weed control.

Starting 2010, Bayer has launched a number of projects to help support farmers maintain their critical minimum tillage practices:

Integrated Weed Management (IWM)

Bayer strongly advocates the IWM concept that increases cropping system resilience and preserves our productive environment. Our approach includes training sessions and material about the correct use of our products Sakura® and Velocity®, which are complementary to an IWM program via their novel modes of action.

WeedSmart education program

This industry-led initiative aims to promote the sustainable use of herbicides in Australian agriculture through encouraging the use of a diverse range of weed control tools. Bayer is a foundation supporter of the WeedSmart program to educate all farmers on best practice.

Herbicide Innovation Partnership (HIP)

In 2015, the Grains Research and Development Corporation (GRDC) and Bayer launched a partnership aimed at jointly developing next-generation weed control solutions. The five-year program will employ 39 new scientists including three cycles of 11 postdoctoral researchers from Australia and New Zealand at the Bayer herbicide research facility in Frankfurt, Germany.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Quality education
- // Industry, innovation and infrastructure
- // Responsible consumption and production
- // Life on land
- // Partnerships for the goals

Further information:

www.iwm.bayer.com
www.weedsmart.org.au
www.diversitycantwait.au



WeedSmart provides critical support for conservation tillage systems



Bayer and GRDC inaugurate new Herbicide Innovation Partnership laboratories in 2016



2018 Australian and New Zealand postdoctoral appointees to HIP in Frankfurt

Integrated Pest Management project

Protecting biodiversity is an important part of sustainable agriculture. Pest control systems incorporating native beneficial insects are an excellent way of both protecting biodiversity and boosting farmer income.

In 2009, Bayer collaborated with diverse stakeholders to create an Australian-first sustainable Integrated Pest Management (IPM) strategy for use in field grown flower head brassica crops. This strategy gives vegetable growers a sustainable way to control one of most serious and persistent pests of cauliflowers and broccoli, diamondback moth (*Plutella xylostella*).

IPM is a long established concept of crop pest management, which promotes the integrated use of all available methods (cultural, biological, genetic and crop protection) to manage pest incursions. Benefits include greater system resilience, lower insecticide use and improved biodiversity. While widely promoted, examples of use in outdoor field conditions are few due to management and commercial complexities.

The Bayer solution is based on the highly selective Bayer insecticides (Movento® and Belt®) combined with biological products from other crop protection suppliers and the native beneficial Diadegma wasp (*Diadegma semiclausum*) in an integrated technical solution. Farmers can reduce the number chemical insecticides applications from seven applications of traditional broad-spectrum insecticides to three or four applications of new 'softer-chemistry' under this strategy.

In 2015, Horticulture Innovation Australia (HIA) launched a new program to promote IPM, to which Bayer provided its input and expertise built during the Brassica IPM initiative. HIA conducted 54 field days across 14 different demonstration sites with attendees including growers, agronomists, industry researchers and major supermarkets. Based on strong interest, the use of the system has spread from Werribee, Victoria, to other parts of Victoria, Western Australia and South Australia.

Thanks to these efforts, IPM practices are now more widely adopted across Australian horticulture industries. The program won an Australian Business Award in 2012 and an AFR Most Innovative Company award in 2013.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Industry, innovation and infrastructure
- // Responsible consumption and production
- // Life on land
- // Partnerships for the goals

Further information:

www.soilwealth.org.au

www.youtube.com/watch?v=18NOtcK5ks4

www.saiplatformaust.org/cases/bayer-sustainable-brassica-vegetable-growing-with-enhanced-ipm





Dr. Paul Horne, a leading IPM consultant, helped develop the Brassica IPM program



Bayer acknowledges the support of The Agosta Family, Fresh Select Pty Ltd, Biological Services Pty Ltd, EE Muir and Sons, Sumitomo Chemicals and especially, Dr. Paul Horne and Jessica Page of IPM Technologies Pty Ltd



Zero hunger and sustainable agriculture

Bee and pollinator health for Australia: Securing agricultural biodiversity and boosting productivity

It is well known that all types of pollinators, especially bees, contribute to the preservation of agricultural biodiversity and significantly boost yields for some crops. The Australian honey bee population is one of the healthiest in the world; however, it still suffers from various disease and environmental pressures. Varroa mite incursion remains a constant threat for which beekeepers must be vigilant.

Since 2015, Bayer has initiated a number of partnerships to inform and educate beekeepers, farmers, and the community regarding bee and pollinator health in Australia. These programs aim to better understand the nature of pollination services in Australia, address current pollinator stressors, prepare for varroa incursion, and boost the health of all pollinators.

These activities do not only improve farmer incomes, but enhance biodiversity in agricultural systems, which can contribute more broadly to eco-system health across Australia.

Bee Biosecurity Videos

Bayer, along with Hort Innovation, Australian Honey Bee Industry Council, Department of Agriculture and Water Resources, Syngenta, Capilano, and The Wheen Bee Foundation funded a joint project with Plant Health Australia and Plant and Food Research NZ in

producing a series of videos on bee biosecurity. Twelve videos were developed to explain the threat of varroa mites, how beekeepers can best protect their hives from pests, and ways crop growers can improve their pollination biosecurity.

Healthy Bee Populations for Sustainable Pollination in Horticulture Project

Together with Horticulture Innovation Australia, Western Sydney University, Greening Australia and Syngenta, Bayer is a partner in a \$7 million five-year research study on characterising and securing alternative pollinators, increasing the availability of pollen and nectar on farmland, investigating the effects of climate change on pollinators, and bee virus research. In addition, on-farm workshops are planned.

“Feed a Bee” Program

The education program aims to increase forage for bees and other pollinators by planting more flowers and establishing additional forage acreage. Bayer partnered with Yates Australia to launch with its staff members in 2017. Based on the outcome of the Sustainable Pollination Project, Bayer aims to expand this program in future years.

BeeConnected App

Bayer supports and promotes the BeeConnected App launched by CropLife Australia, which allows farmers and beekeepers in Australia to confidentially communicate on their activities.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Quality education
- // Life on land
- // Partnerships for the goals

Further information:

- www.beeaware.org.au
- www.beecare.bayer.com
- www.beeconnected.org.au

WESTERN SYDNEY
UNIVERSITY



Hawkesbury Institute
for the Environment



Honey bees pollinating almond crops in Victoria
(Plant Health Australia, 2016)



Quality education

Youth agricultural education programs promote sustainability into the future

The future of sustainable agriculture lies with young people being involved in farming, agriculture and livestock production. Australia faces a critical shortage of both skilled and unskilled workers that can support the expansion of agriculture, and to address the critical challenges posed by climate change and societal acceptance.

Young people bring fresh ideas and are the best advocates for sustainable agriculture in broader society. Bayer is committed to promote careers in science and agriculture and inspire the next generation about food and farming to address these issues.

In Australia, we support many youth agricultural education programs through partnerships with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Future Farmers Network (FFN) and Nuffield Australia among others.

Post-Doctoral training

As part of the GRDC-Bayer Herbicide Innovation Partnership, a total of 33 two-year post-doctoral training positions will be created. Drawn from Australia and New Zealand, these researchers will gain firsthand experience in advanced industrial chemical research that will serve Australian research in future years.

Youth Ag-Summit

Starting in 2013, Bayer has held a bi-annual Youth Ag-Summit to bring together young adults from around the world with leading thinkers and stakeholders.

The 2nd Youth Ag-Summit in 2015 took place in Canberra, Australia, where Bayer co-hosted the event together with FFN. Around 100 youth from 33 countries came together to work on joint solutions for sustainable agriculture and global food challenges. The result was the Canberra Youth Ag-Declaration and the so-called “3 Little Things” actions which each delegate takes back home to drive change at a local level.

The Declaration was presented to the UN Committee on World Food Security in Rome by two Summit delegates.

Bayer and FFN continued our joint support at the 3rd Youth Ag-Summit held in Brussels, Belgium, in October 2017 sending three delegates from Australia and two from New Zealand.





CSIRO Agriculture Vacation program

Each year, around 20 university students are given the opportunity to work on research projects with the CSIRO Agriculture division that is supported by Bayer. Students gain a real life experience of advanced agricultural research.

Longerenong College scholarship

Bayer provides a scholarship to aspiring students attending Longerenong College.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Quality education
- // Partnerships for the goals

Further information:

www.ag-education.bayer.com

www.youthagsummit.com



Project Catalyst: Protecting the Great Barrier Reef

As Australia is a water-scarce country, protecting our water resources within agricultural production plays a central role in achieving sustainable agriculture. Ensuring the quality of water leaving agricultural systems is equally important.

Project Catalyst is a multi-stakeholder initiative that was started in 2009. It aims to support sugarcane growers through better land management and farm practices to improve water quality from sugarcane farms that could potentially impact the Great Barrier Reef. The program seeks to test and validate practices that are good for both farmers and the Reef and to drive practice change and on-farm innovation.

Bayer is involved as a key partner in Project Catalyst. We are supporting changes in farming practices and demonstrating the correct use of Bayer products utilised in sugarcane production. Recent activities have included assessing the potential for digital farming practices to better target product usage.

In 2016 alone, Bayer was involved in 12 farmer demonstration trials targeted at optimising herbicide application and developed a number of weed and pest control plans. Future activities will include grower training to better target product application in order to reduce off-farm losses.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Clean water and sanitation
- // Industry, innovation and infrastructure
- // Responsible consumption and production
- // Life below water
- // Partnerships for the goals

Further information:

www.projectcatalyst.net.au/



Bayer's eight year commitment to Project Catalyst



Digital sugarcane farming is a key focus



New application technology draws strong farmer focus



Phytobac Australia: Water protection builds the basis for sustainable agriculture

Australia is the driest continent on earth, after Antarctica. Ensuring both water quality and water use efficiency are essential for achieving sustainable agriculture. All natural and manmade water bodies are highly valued and must be protected.

Loading and washing down of spray equipment on fields or farmyards is a potential source of contamination for water bodies in Australia. However, there is currently no consistent method for dealing with these sources of contamination.

To tackle this challenge, Bayer has embarked on a program to evaluate the Phytobac system for potential use in Australia. The Phytobac system can treat pesticide wash-down effluent in a responsible manner, safeguarding surface and ground water.

To date, three Phytobac trials have been established:

The first Phytobac demonstration was established at Bayer's wheat and oilseed breeding facility at Longerenong, Victoria in 2015. Data collection is continuing over a three-year period to demonstrate viability in a temperate southern zone. In 2016, Bayer entered into a partnership

with Sugar Research Australia (SRA) to start a joint Phytobac evaluation project. Together, we installed a 5 m² Phytobac system with a 5,000 litre buffer tank at the SRA Meringa Research Farm, near Cairns, Queensland. Data is being collected over a three-year period to establish viability in the tropical North.

Finally a third Phytobac system has been built in partnership with Howe Farming Enterprises Pty Ltd. Howe Farming commissioned a large Phytobac system at their Walkamin headquarters, in Far North Queensland. This will establish the viability of a very large Phytobac system on a large horticulture farm.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Clean water and sanitation
- // Industry, innovation and infrastructure
- // Life below water
- // Partnerships for the goals

Further information:

www.phytobac.com



shra Sugar Research
Australia

Phytobac on Sugar Research Australia's Meringa Research Farm, Queensland



Howe Farming commissioned a large Phytobac system at their Walkamin headquarters, Queensland



Bayer established the first Phytobac at Longerenong, Horsham

Responsible consumption and production

Pain relief for farm animals: Assisting responsible livestock production and food supply

Large scale ruminant livestock production in Australia includes several animal husbandry procedures which can inflict pain and stress on animals. One of the most controversial and visible is “lamb mulesing”, which has raised community concerns and threatened international sales of Australian wool. Proactive and visible management of animal welfare, including stress and pain, is an important component of sustainable agriculture, and critical to long term community and market acceptance for Australian animal products. Since 2005, Bayer has partnered with Animal Ethics to bring Tri-Solfen to the Australian market. Tri-Solfen is a pain relief, vasoconstrictor and antiseptic product developed for various animal species. It is an Australian innovation that combines an analgesic (pain relief), adrenaline (controls blood loss) and antiseptic in an animal adapted formulation to deliver effective treatment to animal wounds.

Between the registration of lamb mulesing indications in 2008 and 2016, Bayer trained over 600 resellers on use of the product. As a result over 80 million lambs were protected from pain in Australia which accounts for 67% of all lambs born during that period.

Bayer’s commitment to the responsible handling of livestock production is still ongoing. In 2017, Bayer and its license partner Animal Ethics successfully registered Tri-Solfen for castration procedures of calves and lambs. Further opportunities to improve animal welfare outcomes are being investigated by our teams.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Quality Education
- // Industry, Innovation and Infrastructure
- // Responsible Consumption and Production
- // Partnerships for the Goals

Further information:

www.growsolutions.org.au
www.animaletics.com.au





“If we gave up mulesing, literally thousands of sheep would be significantly affected from flystrike every year ... Those first lambs treated with Tri-Solfen came out of the mulesing cradle and went straight to find their mothers. They were drinking straight away, walking around with mum and their behaviour showed a greater level of comfort from using pain relief. It was almost like the whole process hadn’t taken place.”

Adam Lomman
Manager, Mutooroo Pastoral Company



Responsible consumption and production

drumMUSTER: Recycling crop protection product containers in a sustainable way

Lifecycle stewardship of crop protection products (CPP) to ensure their safe, responsible and environmentally friendly use is a central commitment of Bayer. Intrinsic to this commitment is the management of empty CPP containers which can present a waste and contamination risk on farms.

drumMUSTER is an industry-led voluntary initiative that collects and recycles eligible, pre-cleaned agricultural and veterinary chemical containers. Established in 1999, drumMUSTER is Australia's first industry wide product stewardship program and is managed by Agsafe Ltd. Australia.

Bayer has been a supporter of drumMUSTER since its very beginning. All of our eligible CPPs are accepted into the program. The program aims at diverting all empty CPP and related industry containers from landfill and general pollution. Bayer encourages farmers to collect, rinse and return all CPP containers to a local collection site.

At the collection sites, the containers are managed by approved processors that recycle and transform them into a range of products including wheeled rubbish bins, public furniture, construction materials and road markers. Over 800 drumMUSTER collection sites are operating across Australia.

To date, over 30.5 million containers have been collected by drumMUSTER in Australia. Its service is ongoing and expanding further as more manufacturers and industries participate.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Responsible Consumption and Production
- // Partnerships for the Goals

Further information:

www.drummuster.org.au
www.agsafe.org.au



drumMUSTER and chemCLEAR are administered by the industry funded body, Agsafe.



drumMUSTER collects empty drums from 800 sites across Australia



Responsible consumption and production

ChemClear: Sustainably managing unwanted crop protection products

When using crop protection products (CPP), farmers not only need to manage their CPP containers but also stock of products that might be left-over or out of date. Responsible waste management of agrochemicals is key to achieving sustainable agriculture.

Complementing the drumMUSTER program, the ChemClear initiative provides farmers with an ongoing avenue to safely dispose of unwanted CPPs and encourages the protection of land and waterways.

Bayer has been engaged in ChemClear since its inception in 2003 with all Bayer products able to be used in the program. In addition, Bayer encourages farmers to bring all their unwanted products to ChemClear sites for responsible waste management.

ChemClear aims at removing all unwanted CPPs from farms and the community so that they cannot become a hazard in the future. In doing so, the service adds no additional costs. Farmers only need to register their unwanted chemicals online. Depending on the demand, ChemClear undertakes two to three state collections and several regional collections annually. Since its launch, the ChemClear program, delivered by Agsafe, has collected over

640,000 litres and kilograms of unwanted and obsolete chemicals from regional and local communities across Australia.

All related SDGs:

- // Zero hunger and sustainable agriculture
- // Responsible Consumption and Production
- // Partnerships for the Goals

Further information:

www.chemclear.org.au
www.agsafe.org.au



drumMUSTER and chemCLEAR are administered by the industry funded body, Agsafe.



ChemClear provides advice, recovery and disposal of un-used chemicals across Australia





Bayer is a member of the Sustainable
Agriculture Initiative Platform of Australia.
www.saiplatformaust.org

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