Representing **the best** of the plant science industry

CropLife AUSTRALIA

SUBMISSION TO

HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON AGRICULTURE AND INDUSTRY

INQUIRY INTO THE ROLE OF TECHNOLOGY IN INCREASING AGRICULTURAL PRODUCTIVITY IN AUSTRALIA

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1. INTRODUCTION

CropLife Australia (CropLife) is the peak industry organisation representing the agricultural chemical and biotechnology (plant science) sector in Australia. CropLife represents the innovators, developers, manufacturers and formulators of crop protection and agricultural biotechnology products. The plant science industry provides products to protect crops against pests, weeds and diseases, as well as developing crop biotechnologies that are key to the nation's agricultural productivity, sustainability and food security. The plant science industry is worth more than $17.6-billion a year to the Australian economy and directly employs thousands of people across the country. CropLife Australia is a member of CropLife Asia and part of the CropLife International Federation of 91 CropLife national associations globally.

CropLife and its members are committed to the stewardship of their products throughout their lifecycle and to ensuring that human health, environment and trade issues associated with agricultural chemical use in Australia are responsibly and sustainably managed. Our member companies contribute more than $13 million a year on stewardship activities to ensure the safe and effective use of their products. CropLife ensures the responsible use of these products through its mandatory industry code of conduct and has set a benchmark for industry stewardship through programs such as ***drum****MUSTER*, ChemClear® and Agsafe Accreditation and Training. Our stewardship activities demonstrate our commitment to managing the impacts associated with container waste and unwanted chemicals.

The world's population is predicted to increase to 9.6 billion by 2050, requiring an increase in global food production of 70 per cent. Providing enough food in the context of production constraints, volatile consumption patterns and a changing climate will be an unprecedented scientific, economic and public policy challenge. The situation provides an opportunity for Australian farmers to both assist in the global food security effort and to profit from increased demand for their agricultural products. By adopting innovative farming practices, such as the sustainable and efficient use of crop protection products and genetically modified (GM) crops, the Australian farming sector will be able to produce more sustainably and with greater productivity.

Meeting the challenges presented by sustainably increasing food production to meet growing global demand will require science-based policies that support all production systems, including existing and future production tools and technologies. Sustainable production systems will include the conventional systems reliant on the timely, responsible and considered application of crop protection products in ways that maximise yield and manage potential risks. Crop protection products (including fungicides, herbicides and insecticides) are currently relied upon to increase global food production by between 30 and 50 per cent[1]. Supporting industries to develop and introduce newer crop protection products that are better targeted to Australian pests, climates and crops will help Australia play its part in addressing global food security.

In particular, crop protection and biotechnology solutions can assist farmers in producing high yields with fewer natural resources by reducing water consumption, increasing a crop's nutrient uptake and reducing the need for other inputs.

The plant science industry's crop protection products include Fungicides, herbicides and insecticides that are critical to maintaining and improving Australia's agricultural productivity to meet global food security challenges in coming decades. Each of these products is rigorously assessed by the Australian Pesticides and Veterinary Medicines Authority to ensure they present no unacceptable risk to users, consumers and the environment. In 1995, it took the assessment of 52,500 compounds to develop one new effective crop protection chemical active. It now requires the assessment of more than 140,000 compounds and expenditure of more than US$250 million over a 10 year period to bring just one new successful crop protection product to the market. Without access to these tools, farmers may potentially lose as much as 50 per cent of their annual production to pests, weeds and diseases. According to a Deloitte Access Economics report released in 2013, '*Economic activity attributable to crop protection products',* it is estimated that up to $17.6 billion of Australian agricultural output (or 68 per cent of the total value of crop production) is attributable to the use of crop protection products.

[1] Deloitte Access Economics, 2013, 'Economic activity attributable to crop protection products' CropLife Australia

Crop protection products must be used sparingly, carefully and responsibly. The responsible use of crop protection products must be supported by a regulatory scheme that maximises the benefits associated with their responsible use, while minimising the costs from excessive, inappropriate and ineffective regulation. Farmers need these products because of the benefits they provide to their businesses and consumers need these products to ensure they have access to safe, affordable and nutritional food. While it is important for governments to provide for appropriate and rigorous regulation of crop protection products and biotechnologies, any regulation must be mindful of the effects that poorly considered and excessive regulation will have through increasing production costs, discouraging investment and innovation, while not delivering any improvement in safety, health or environmental outcomes.

Crop protection products are crucial to modern integrated pest management techniques and systems used by farmers. Access to fewer crop protection tools would facilitate faster development of resistance among target pests, diminishing the efficacy of remaining chemical options. The economic impact of weeds alone is estimated to be in excess of $4 billion each year, with an impact on the environment that is similar in magnitude[2]. It is imperative that the Australian Government maintain the primacy of science and facts. There is a need for a paradigm shift in thinking from regulating the science (as it has been proven safe) to facilitating the growth of the Australian economy by driving the plant science industry (both in the public and private domain) to its full potential.

GM crops, an application of modern agricultural biotechnology, 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. Globally, government regulators have independently reached the same conclusion – that cultivation of GM crops poses no greater risk to human health or the environment than cultivation of conventional (non-GM) varieties. More importantly, they are a necessary and important tool in meeting the global food and nutrition security challenge.

GM crops have over a period of 19 years demonstrated their sustainability credentials, including by way of:

- Improving the sustainable use of crop protection products
- Reducing tillage (facilitating no-till farming)
- Reducing on-farm fuel use
- Reducing CO_2 emissions from farming operations
- Increasing soil carbon storage
- Increasing water use efficiency.

GM crops currently under research and development in Australia will help Australian farmers to combat environmental stresses such as drought, acid soils and salinity, which are being caused by climatic changes and previous non-sustainable farming practices. 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 in saturated fats and with improved cooking qualities.

Every legitimate scientific and regulatory body that has examined the evidence has arrived at the conclusion that GM crops and the foods they produce are as safe as their conventional counterparts. This includes the World Health Organization, the Australian Academy of Science, the European Commission, the American National Academy of Sciences, the Royal Society of Medicine and many more. GM crops currently grown around the world and the food they produce have been studied extensively and repeatedly declared safe by scientific bodies and regulators globally, and with three trillion meals containing GM food having been consumed with not one single substantiated health claim anywhere, the evidence and science on the safety of GM Crops on the environment and human health is clear.

[2] Australian Weeds Strategy – A national strategy for weed management in Australia. National Resource Management Ministerial Council (2006), Australian Government Department of the Environment and Water Resources, Canberra, ACT.

One threat to the potential success of this important agricultural innovation is the lack of a nationally consistent scheme for gene technology regulation in Australia. Unnecessary and overly stringent regulation brings with it an equally unnecessary cost burden. All regulation should be commensurate with the associated risk, cost and benefit to the community. The current gene technology regulatory system in Australia already imposes a much greater level of regulatory burden on the industry than occurs in some other countries and this burden is exacerbated by unclear and inconsistent market interventions by state governments.

Given that Australian farmers produce almost 93 per cent of Australia's daily domestic food supply[3], CropLife commends the Australian Government for seeking to drive long-term agricultural policies and ensure Australia's agriculture sector remains a significant contributor to the economy and local communities.

Australian agriculture and its associated industries generate over $150 billion each year and underpin 12.1 per cent of Australia's GDP. The plant science industry is an integral input driving this performance.

This submission focuses on the plant science industry's role in enhancing the productivity of Australia's agricultural industry and the critical importance of innovation to the industry and its sustainability. It submits that a truly productive and competitive agriculture sector that can sustainably contribute to food security in Australia and globally requires access to modern farming technologies, including agricultural biotechnology and crop protection products.

This submission also posits that increased innovation, productivity, investment and trade are not tenable without nationally consistent agricultural regulations that are efficient and effective. A long-term sustainable pesticide resistance management program is crucial to recognising the challenge of maintaining farm sector access to crop protection products. Increased involvement in international decision making bodies will also provide opportunities for influencing decision making thereby enhancing agricultural exports and driving new market access.

[3] Department of Agriculture, Fisheries and Forestry (2009). 'Australian Food Statistics 2008'

2. IMPROVEMENTS IN THE EFFICIENCY OF AGRICULTURAL PRACTICES DUE TO EMERGING AND INNOVATIVE TECHNOLOGIES IN THE AGRICULTURAL SECTOR

2.1 *The plant science industry enhances the contribution of agriculture to economic growth and helps to build a competitive, productive and sustainable agricultural industry*

The plant science industry's crop protection products (CPPs) include fungicides, herbicides and insecticides that are critical to maintaining and improving Australia's agricultural productivity to meet global food security challenges in coming decades.

In 1995, it took the assessment of 52,500 compounds to develop one new effective crop protection chemical active. It now requires the assessment of more than 140,000 compounds and expenditure of more than US$250 million over a 10 year period to bring just one new successful crop protection product to the market. Without access to these tools, farmers may potentially lose as much as 50 per cent of their annual production to pests, weeds and diseases. According to a Deloitte Access Economics report released in 2013, '*Economic activity attributable to crop protection products',* it is estimated that up to $17.6 billion of Australian agricultural output (or 68 per cent of the total value of crop production) is attributable to the use of CPPs. Over half of this contribution is from fungicides, reflecting their significant contribution to the value of production of vegetables, fruits and nuts. This estimate includes the contribution to organic crop production.

All agricultural production systems, whether they be conventional, organic or reliant on biotechnologies employ strategies to control pests, weeds and diseases. Without the responsible use of CPPs, as much as half of the world's food supply could be lost. Ensuring that Australia's farmers have access to innovative modern technologies to protect their crops will support the ongoing economic, environmental and social sustainability of agriculture in Australia.

According to the 2013 Deloitte Access Economics report, the Australian crop protection product sector produced almost $2.5 billion in output in 2011–12, as measured at the factory gate (APVMA, 2013). This revenue generated by the sector contributes a total of $1.8 billion to value add, made up of a direct contribution of $620 million and indirect contribution of $1.2 billion in supply sectors[4]. These direct and indirect contributions are made up of gross operating surplus and wages.

In terms of employment, the crop protection product sector also contributes just over 9,250 in full time equivalent employees, made up of about 2,050 directly in the crop protection product manufacturing sector and 7,200 in the sectors that supply inputs to the crop protection product sector.

CropLife members support all production systems, including organic, by providing CPPs to meet the needs of Australian farmers. Our members' success is intrinsically linked with that of all Australian farmers. Ultimately, a sustainable agricultural system for Australia will involve balancing a series of potentially competing issues and making decisions about the most effective, efficient and sustainable way to manage a farm taking into account the type of production system, climate, soil types, pest pressures and economic considerations.

Farmers ultimately have the most detailed and extensive knowledge about their farms. Any sustainable agricultural policy will need to recognise the critical role that farmers play in ensuring the ongoing sustainability of their farms. Giving farmers greater choice and options to manage their land and production systems provides them with the best opportunity to make decisions that promote the ongoing sustainability of Australian agriculture.

[4] Deloitte Access Economics, 2013, *Economic activity attributable to crop protection products*, CropLife Australia

2.2 *High cost of development of a new crop protection product is met by the plant science industry*

It is important in the context of this Inquiry into the role of technology in increasing agricultural productivity in Australia that the House of Representatives Standing Committee on Agriculture and Industry is aware of the investment the plant science industry makes in bringing a new and innovative crop protection product to market.

In 1995, it took the assessment of 52,500 compounds to develop one new effective crop protection chemical active. It now requires the assessment of more than 140,000 compounds and expenditure of more than US$250 million over a 10 year period to bring just one new successful crop protection product to the market.

The cost and duration of a new chemical product or GM trait development, particularly when navigating the regulatory process, highlights the need for a transparent and workable regulatory system based on sound science and harmonised risk assessment.

The high level of private sector investment in agricultural R&D in Australia demonstrates the plant science industry's commitment to supporting sustainable agriculture and the extent necessary to bring technological innovation to the market. Ongoing investment by government and industry promises to continue to improve the sustainability of Australia's agricultural industries.

2.3 While Australia's regulatory environment is comprehensive, industry recognises its responsibility for ensuring the ongoing sustainable use of crop protection products

Australia is fortunate to have a comprehensive, although somewhat expensive and inefficient regulatory environment, to ensure the safety, efficacy and sustainability of agricultural chemical products used in Australia. The Australian Pesticides and Veterinary Medicines Authority (APVMA) conducts a pre-market risk assessment of all new pesticide products before they are registered and sold. The APVMA's assessment manages the sustainability of pesticide products by ensuring that products, when used in accordance with the directions specified on the label, present no unacceptable risks to users, consumers, the environment or trade.

CropLife members recognise they have an ongoing responsibility to ensure the sustainability of their products. For this reason, CropLife internationally has developed and supported the Food and Agriculture Organization of the United Nations *International Code of Conduct on the Distribution and Use of Pesticides.* This Code specifies obligations about the stewardship of agricultural chemicals throughout their lifecycle, from innovation, discovery and development through to ultimate disposal of packaging waste. In addition, CropLife Australia members must also abide by the *CropLife Australia Code of Conduct* and the *Agsafe Code of Conduct.* These Codes specify the obligations of CropLife Australia members, including requiring participation in the ***drum****MUSTER* and ChemClear® industry stewardship programs. Many CropLife members also engage in significant additional stewardship of their products, which ensures products sold by a company are being used in accordance with all the conditions and precautions necessary for that product.

Collectively, these controls help maintain the sustainability of Australian agriculture by responsibly and efficiently managing farm inputs. The ***drum****MUSTER* and ChemClear® industry stewardship programs also address environmental and health and safety concerns by disposing and recycling farm chemical waste. To date, these programs have disposed of in excess of 26 million chemical containers and over 501,064 Lt/kg of old and unwanted chemicals. It is important to recognise that these programs are undertaken voluntarily by industry, not through any regulation, again reinforcing how the issues of sustainability are culturally entrenched both in Australia and internationally.

2.4 *Organic production systems are increasingly using crop protection products*

Organic production systems often face unique challenges to remain productive and compliant with the standards required by organic certification systems. Plant pests and diseases are just as attracted to organic produce as conventionally grown produce. Plant protection tools are therefore critical to support organic production systems.

CropLife Australia members provide agricultural chemical products to organic farmers across Australia, including organic fungicides and insecticides. Organic production in Australia continues to experience high growth rates. Should this trend continue, it will increase the demand for organic CPPs, as well as newer products to meet specific requirements. The economic sustainability of these emerging industries will be reliant on the availability of adequate crop protection tools.

At present, many organic farms have limited crop protection options due to the current small size of the industry. While this may change in the future, the scientific data required to develop and register new products for organic producers can exceed the likely size of the market. The 'minor-use' problem, where the economic return to a registrant from a new product use is exceeded by the regulatory cost of regulatory requirements for approving a new use, occurs across all agricultural systems in Australia.

2.5 Conventional broadacre production systems use crop protection products efficiently and effectively

For conventional production systems, sustainability needs to consider different pressures and factors that have an impact on the sustainability of the farming system. Broadacre farming of cereals and grains is an internationally competitive and trade exposed market. Standards for grain quality and safety can have serious impacts for market access should they be breached. The international trade in grains also presents significant biosecurity risks that must be controlled to prevent the spread of potentially disastrous pest species. The sustainability of this sector is dependent upon the efficient and responsible use of critical inputs (including CPPs, among others) to remain both economically and environmentally sustainable.

Indeed, modern broadacre production systems adopt approaches that are both economically and environmentally sustainable, while also producing significant social benefits. For example:

- Modern herbicides and insecticides are highly selective. Modern selective insecticides can target harmful pests while leaving beneficial insects untouched, generating both productivity and biodiversity benefits. Selective herbicides can target only weeds while leaving a growing crop unharmed. This allows farmers to choose the best crop protection technologies to suit the particular circumstances of their farm, as well as providing for flexibility in the production system.
- The responsible and sustainable use of herbicides enables the use of minimum and no-till production systems. Replacing tillage with the use of herbicides provides improved weed control, increasing yields while also providing ancillary environmental benefits. Reducing the need for tillage reduces carbon emissions, improves soil structure and soil biodiversity, and assists soils retain both water and organic matter.
- Modern farming systems also assist in reducing total pest and weed pressures, for the benefit of other production systems that may choose not to use pesticide tools.

Conventional production systems are responsible for the vast majority of food production. They succeed by producing safe, sustainable and abundant food through minimising production inputs and maximising yield. The efficiencies inherent in these production systems enable farmers to feed more people with less land, water and other resources. This reduces pressure on remaining areas of wilderness to be converted to agricultural production. As one of the key drivers of biodiversity loss globally is loss of habitat for native species, the environmental benefits of producing more food more efficiently is significant.

2.6 *Conventional horticultural production systems rely on innovative crop protection products*

Horticultural production systems use modern pesticide products to efficiently produce higher quality, safer food. Horticultural systems often operate in locations that can lead to potentially conflicting land uses that can require better farm management practices. Chemical application often needs to be undertaken in ways that prevent any unanticipated impacts upon neighbouring land uses. Careful application and product choice, as well as user training and licensing can help achieve this aim and allow productive horticultural enterprises to prosper.

Critically, ongoing innovation and product development can support new and emerging horticultural industries. As farmers seek to diversify their production to meet market demands and to build the resilience of their enterprises, new products will be required to address new applications on minor and specialty crops. This not only builds the economic sustainability of farming enterprises generally, but may also result in the development of new products and markets that are better suited to individual farm circumstances.

2.7 *The benefits of agricultural biotechnology, specifically genetic modified (GM) crops, are wide-reaching*

The first generation of GM crops, with productivity enhancing input traits such as insect resistance and herbicide tolerance, have been rapidly adopted around the globe providing clear agronomic, economic, environmental and social benefits to those 18 million farmers in 28 countries who have accessed the technology[5].

2.8 *GM crops in Australia: a snapshot of GM cotton and GM canola benefits to sustainable agriculture*

In Australia, growing GM cotton varieties has seen environmental benefits resulting from improving the sustainable use of insecticides and changes in the type of insecticides and herbicides used. First grown in 1996, almost 100 per cent of Australia's cotton crop is now grown with GM varieties[6]. Cultivation of GM insect resistant cotton varieties has enabled a reduction in the amount of insecticide active ingredient used by up to 85 per cent[7,8]. This, in conjunction with industry stewardship practices, has greatly reduced the potential for chemical runoff into rivers in cotton growing regions of Australia[9].

The types of chemical being used have also changed. Because of the 'in-built' insecticide in GM insect resistant cotton, insect control can be more targeted and specific meaning there is less of an impact on non-target organisms, thereby allowing beneficial (i.e. predatory insects) to remain in the crop. It is worth noting that the insecticidal 'Bt' protein expressed in GM insect resistant cotton is also an approved input in organic agriculture. In-crop fuel use is also reduced as a result of fewer insecticide applications being required.

GM herbicide tolerant cotton has increased the adoption of minimum tillage practices and the replacement of some herbicides with less hazardous alternatives. By facilitating minimum tillage, GM herbicide tolerant cotton has reduced soil erosion, increased retention of soil moisture and increased soil carbon.

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5 James, Clive 2015. 'Global Status of Commercialized Biotech/GM Crops: 2014'. *ISAAA Brief No. 47*. ISAAA: Ithaca, NY.

6 Cotton Australia Cotton Fact File: Biotechnology http://cottonaustralia.com.au/cotton-library/fact-sheets/cotton-fact-file-biotechnology accessed 4 April 2014.

7 Hattersley P, Johnson H, Glover J, Foster M, Wesley V and Mewett O, 2009. 'Plant Gene Technology: Improving the Productivity of Australian Agriculture'. Australian Government Bureau of Rural Sciences, Canberra.

8 Holtzapffel R, Mewett O, Wesley V and Hattersley P 2008. 'Genetically modified crops: tools for insect pest and weed control in cotton and canola'. Australian Government Bureau of Rural Sciences, Canberra.

9 *Ibid.*

Economic and social benefits have also been realised through the adoption of GM crops in Australia. For example, in GM cotton growing regions, the incidence of on-farm workplace incidents has decreased as a result of reduced insecticide spraying and also the reduced need for hand weeding in cotton fields. Community perceptions of the Australian cotton industry have also markedly improved since GM cotton was first grown in 1996[10]. Cultivation of GM cotton varieties has allowed cotton farmers to spend less time on the tractor and more time with their families, an important social implication for rural Australia that should not be overlooked.

The adoption of GM herbicide tolerant canola varieties in Australia has also resulted in environmental benefits and increased environmental sustainability. For example, just as for those farmers growing GM herbicide tolerant cotton, cultivation of GM herbicide tolerant canola has allowed farmers in New South Wales, Victoria and Western Australia to use selective, targeted and lower hazard crop protection products.

Herbicide tolerant canola provides farmers with more effective weed control, particularly for those broad leaf weeds that are closely related to canola. Varieties of non-GM herbicide tolerant canola have been grown in Australia since 1993 (triazine tolerant) and 2000 (imidazolinone tolerant). The introduction of glyphosate tolerant GM canola merely adds another weed management option to farmers' weed control toolbox. Both non-GM and GM herbicide tolerant canola technologies have led the shift to no-till or conservation tillage systems with associated environmental benefits such as reduced soil erosion and increased soil water and carbon retention.

The agronomic benefits of GM (when compared to non-GM) herbicide tolerant canola include increasing the options for in-crop weed control, allowing herbicide rotations that address the risk of herbicide resistant weeds developing and increasing the yield in subsequent cereal crops, which could be adversely affected by herbicide carry over from the herbicides used in non-GM herbicide tolerant crops.

The control of insect pests and weeds is a significant cost for Australian farmers. Crop biotechnology provides Australian farmers with new tools that can be used as part of Integrated Weed and Pest Management programs to maintain the sustainability and longevity of pest and weed control options in Australia.

2.9 *The global socio-economic and environmental impact of GM crops*

The most recent annual report on the global socio-economic and environmental impact of GM crops from the British consultancy firm PG Economics indicated continued considerable economic and environmental benefits to the farmers and general public in countries where GM crops are grown[11]. The report indicated that the net benefit at the farm level in 2013 from growing GM crops was US$20.5 billion. For the 17 year period (1996-2013) covered by the report, the global farm income gain has been US$133.5 billion. Australian GM cotton and canola farmers have realised a benefit of more than US$885 million in the period 1996-2013[12].

The PG Economics report also notes that GM crops have contributed significantly to reducing the release of greenhouse gas emissions from agricultural practices. This resulted from less fuel use and additional soil carbon storage from reduced and no-tillage farming systems associated with GM crops. In 2013, the permanent CO_2 savings from reduced fuel use were the equivalent of removing 940,000 cars from the road and the additional probable soil carbon sequestration gains in 2013 were equivalent to removing 11,520,000 cars from the road[13]. This is equal to 71 per cent of all motor vehicles registered in Australia.

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10 *Ibid*

11 Brookes G and Barfoot P 2015. 'GM crops: global socio-economic and environmental impacts 1996-2013'. *PG Economics*, Dorchester, May.

12 Australian GM cotton farm income benefit US$2844.3 million 1996-20122013; GM canola farm income benefit US$341 million 2008-20122013.

13 Brookes G and Barfoot P, *Op. cit*

The report notes that crop biotechnology has contributed to a significant reduction in the environmental impact associated with herbicide and insecticide use on the areas devoted to GM crops. From 1996-2013, the use of pesticides on the global GM crop area was reduced by 550 million kg of active ingredient (8.6 per cent total reduction) and the environmental impact associated with herbicide and insecticide use on GM crops, as measured by the Environmental Impact Quotient indicator, fell by 19 per cent[14].

If GM crops had not been available to the 18 million farmers growing them in 2013, an additional 18 million hectares of conventional crops would have been required to produce the same tonnage produced by GM crops for 2013 alone[15].

A recent study reported in the science journal *Nature*, found that in China over the past 16 years, vast plantings of GM insect resistant crops have helped to control several major insect pests and reduced the need for additional insecticide applications by promoting the bio-control services offered by beneficial predatory insects[16]. On conventional crops, these beneficial insects were killed by the broad-spectrum insecticides used to control the major target pests (for example, cotton bollworm). This study found a marked increase in the abundance of three arthropod predators (ladybirds, lacewings and spiders) and a decreased abundance of aphid pests associated with the widespread adoption of GM insect resistant cotton and reduced insecticide sprays in this crop[17].

A new study by the International Food Policy Research Institute (IFPRI) measures the impacts of agricultural innovation on farm productivity, prices, hunger and trade flows to 2050 and identifies practices that could significantly benefit developing nations. The study reinforces that no single agricultural technology or farming practice will provide sufficient food for the world in 2050[18]. This highlights the need for a combination of agricultural technologies and practices such as heat-tolerant crops and no-till farming. Australian farmers must be able to adopt the latest safe and proven agricultural technologies and innovations to combat the threat of food insecurity, the impacts of climate change and increasing costs, while remaining internationally competitive.

2.10 *The safety of genetically modified crop products has been continually reaffirmed over time*

The science of agricultural biotechnology is well established and clear – every legitimate scientific and regulatory body that has examined the science-based evidence has arrived at the conclusion that approved GM crops are as safe as their conventional counterparts. This includes the World Health Organization, the Australian Academy of Science, the European Commission, the American National Academy of Sciences, the Royal Society of Medicine and many more.

A significant number of peer reviewed scientific research papers have been published that describe the results of biosafety research on GM crops. For example, see the list maintained online of over 400 published peer reviewed papers that examine the safety of biotech crops[19]. The overwhelming weight of scientific consensus in these papers confirms that approved GM crops are as safe as their conventional counterparts[20].

GM crops have been grown and consumed for more than 18 years and people around the world have eaten more than three trillion meals containing biotech-derived foods or ingredients. It is the most tested and regulated food product in history. There are no substantiated scientific reports of any food safety issues related to the consumption of genetically modified crops.

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14 Brookes G and Barfoot P, *Op. cit*

15 James, Clive, *Op. cit*

16 Lu Y, Wu K, Jiang Y, Guo Y and Desneux N 2012. 'Widespread adoption of Bt cotton and insecticide decrease promotes bio control services'. *Nature* doi: 10. 1038/nature11153 published online 13 June 2012.

17 *Ibid.*

18 Rosegrant Mark W. et al. 2014 'Food Security in a World of Natural Resource Scarcity: The Role of Agricultural Technologies' *International Food Policy Research Institute (IFPRI)*

19 http://genera.biofortified.org/viewall.php accessed September 2015

20 *Ibid.*

2.11 *Nutritional benefits of genetically modified crops are in research and development*

Agricultural biotechnology, specifically genetic modification, is being used to develop nutrient-dense varieties of staple crops that could be grown for a fraction of the recurrent estimated annual costs of supplementation programs in developing countries and could reach far more people. The nutritional quality of staple foods can be substantially improved using transgenic methods compared to what can be accomplished using traditional breeding.

For example, Golden Rice (with elevated levels of pro-Vitamin A) is expected to be available in the coming years in the Philippines and probably followed by Bangladesh, Indonesia and Vietnam. In developing countries, 200-300 million children of preschool age are at risk of Vitamin A deficiency, which is the single most important cause of childhood blindness in developing countries. Every year, about half a million children go blind as a result of Vitamin A deficiency and 70 per cent of those die within a year of losing their sight.

Golden rice could have been available and saving children's lives for many years were it not for the ongoing activism of anti-humanitarian organisations, who first claimed the elevated levels of pro-Vitamin A in the modified rice were toxic. When this was shown to be patently untrue, these activist organisations changed tack and claimed the level of pro-Vitamin A in the rice was in fact too ***low*** to have any meaningful biologic effect.

Agricultural biotechnology is also being used to produce vegetable oils with low saturated fats and properly balanced essential fatty acids, which are associated with reducing the risk of heart disease and stroke, important for brain function and essential for growth and development of infants.

A new GM wheat variety currently going through field trials will help combat one of the most serious health issues for developed countries – the rise of diet related conditions such as Type 2 diabetes, obesity, cardiovascular disease and colo-rectal cancers. Wheat high in resistant starch has the potential to improve health across the entire Australian population[21].

In comparison, a recent Stanford University meta-analysis[22] of 240 existing studies comparing organic and conventionally produced foods did not find evidence that organic foods are healthier or carry fewer health risks than conventional alternatives. No consistent differences were seen in the vitamin content of organic products and only one nutrient, phosphorous, was significantly higher in organic versus conventionally grown produce (the researchers note that because exceptionally few people have a phosphorous deficiency, this is of little clinical significance). The researchers also stressed that consumers need to be aware that organic foods are not 100 per cent free of pesticides. These researchers concluded that their study showed there is a lot of variation between farming practices and there are many different factors that go beyond method of production, which are important in predicting nutritional quality and harms.

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21 CSIRO, http://www.csiro.au/Outcomes/Food-and-Agriculture/New-wheat-with-a-healthy-future.aspx, accessed March 2014

22 Smith-Spangler, C, Brandeau, M L, Hunter, G E, Bavinger, J C, Pearson, M, Eschbach, P J, Sundaram, V, Liu, H, Schirmer, P, Stave, C, Olkin, I & Bravata, D M, 2012, 'Are Organic Foods Safer or Healthier Than Conventional Alternatives?' *Ann Intern Med*, *157*, 348-366.

2.12 *There are numerous environmental benefits of adopting agricultural biotechnology – true sustainability must recognise coexistence of farming*

True sustainability must recognise that the variety in farming systems, environments and crops means that a 'one-size-fits-all' approach is neither logical nor effective. Measures that are environmentally sustainable in market gardening in peri-urban areas around Australia may not be economically sustainable in a broadacre cropping/grazing system. Any approach the Australian Government takes to improving agricultural sustainability must recognise this reality.

Coexistence is the practice of growing crops with different quality characteristics or intended for different markets in the same vicinity without becoming comingled and thereby possibly compromising the economic value of both. Coexistence is based on the premise that all famers should be free to cultivate the crops of their choice using the production system they prefer, be it using crop biotech, conventional or organic methods.

Coexistence of various production methods is not a new concept to the agricultural community. Famers have practiced coexistence for generations in order to meet customer demands for different types of products. Breeders and farmers are accustomed to breeding and producing different crops such as bread and noodle wheat, feed and malting barley, and high- and zero-erucic acid canola alongside each other. They are also accustomed to producing certified seed to meet defined purity standards. This experience demonstrates that coexistence of a wide range of production methods is not a problem, provided technical and procedural guidelines are carefully followed and cooperation between neighbouring farms is encouraged. This applies equally to the use of modern crop protection and crop biotechnology products in farming systems.

Coexistence is not about environmental or health risks because it refers only to the use of crop biotechnologies or CPPs that have been approved as safe for the environment and human health by Australian Government regulators.

CropLife's position is that all agricultural production systems should have an equal opportunity to contribute to the agri-food production system under free market conditions. Preference for one production system over another should not be the result of artificial, discriminatory and impractical public policy decisions made by state governments as is currently the case in South Australia and Tasmania with the ban on crop biotechnology products.

2.13 *High cost of development of a new biotechnology is met by the plant science industry*

Bringing a new GM trait to market is a significant investment made by the plant science industry. To determine the relative cost and duration of the process, CropLife International commissioned consultancy firm Phillips McDougall to survey the plant science industry's largest developers. The survey found that it takes 13 years research and development (R&D) plus US$136 million to develop each new GM crop trait[23].

The cost and duration of new GM trait development, particularly navigating the regulatory process, highlights the need for a transparent and workable regulatory system based on sound science and harmonised risk assessment. Improvements to state and territory participation in the national gene technology regulatory framework will help remove unnecessary barriers to innovation and trade for Australia, assisting the nation in achieving a clean, green and sustainable agricultural sector.

The high level of private sector investment in agricultural R&D in Australia demonstrates the plant science industry's commitment to supporting sustainable agriculture and the extent necessary to bring technological innovation to the market. Ongoing investment by industry and government promises to continue to improve the sustainability of Australia's agricultural industries.

[23] Phillips McDougall, 2011, 'The cost and time involved in the discovery, development and authorisation of a new plant biotechnology derived trait'. A consultancy study for CropLife International, September 2011.

3. BARRIERS TO THE ADOPTION OF EMERGING AND INNOVATION TECHNOLOGIES IN AGRICULTURE

Barrier 1: The lack of recognition that APVMA registered agricultural chemical product labels already comply with model workplace health and safety regulation labelling requirements

Agricultural chemical labels are the product of an expert technical risk assessment by the Australian Pesticides and Veterinary Medicines Authority (APVMA), where hazard warnings are applied as required, reflecting identified risks. Currently, agricultural chemicals that comply with the requirements of the APVMA are also considered to comply with Work Health and Safety (WHS) Regulations. However, the Model Work Health and Safety Regulations 2011 introduced by Safe Work Australia (SWA) subject agricultural chemicals to additional labelling requirements based on the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), irrespective of whether the product formulation or prescribed use mitigates the risk of the hazard to negligible levels.

If recognition of APVMA approved labels is not reinstated prior to the implementation date of 1 January 2017, this change and duplication in agricultural chemical labelling regulations will undermine the effective work health and safety measures already in place to protect users of agricultural chemicals. It is the same recognition that was and is still given to pharmaceutical chemicals regulated by the Therapeutic Goods Administration (TGA), with the only difference being that the Department of Health proactively secured the ongoing recognition when consultation about changes to WHS regulations began in 2009, whereas the Department of Agriculture under the previous government did not.

The additional GHS labelling requirements for agricultural chemicals are opposed by the responsible government regulator, the APVMA; the relevant policy department, the Department of Agriculture; the industry body that represents the majority of agricultural chemical users, the National Farmers' Federation and the industry bodies which represent the manufacturers of products affected by the regulations, CropLife Australia, the Plastics and Chemicals Industries Association and Accord Australasia.

Two conflicting labelling systems increases risk to worker health and safety

Compliance with two separate sets of fundamentally conflicting labelling systems will significantly increase the amount of arbitrary hazard information on labels, confusing workers and therefore threatening their health and safety in the workplace. The APVMA already has the power and responsibility to require registrants to change labels to ensure they contain adequate instructions to protect human health and safety. Any hazards identified where the risk has not been appropriately managed by the APVMA could simply be addressed by requesting the Authority to modify the label.

Hazard information is already provided in the form of Safety Data Sheets (SDS), which are legally required to be accessible at every workplace where chemicals are stored. Duplicating the information already provided in an SDS on a label will not result in any improvements in worker health and safety.

A risk-based approach to agricultural chemical labels is recognised by the Food and Agriculture Organization of the United Nations (FAO) as superior to GHS for protecting worker health and safety

Claims by SWA that hazard labelling represents international best practice for workplace labelling are, at least for agricultural chemical products, substantially incorrect. The GHS labelling system is supported by industry when risk cannot be determined at the packaging and labelling stage by an expert authority because the chemical could be used in a variety of ways for a variety of purposes. GHS is an excellent scheme for developing countries that unlike Australia, do not have expert regulators to manage agricultural chemical products and aren't able to complete appropriate risk assessments for local conditions.

Fortunately, Australia has an advanced risk assessment process conducted by an expert regulatory authority such as the APVMA. The use of GHS labelling is not appropriate where hazards are assessed and risks appropriately managed by the APVMA. These risks are often completely mitigated by product formulation, or reduced to negligible risk through prescribed use on APVMA regulated labels.

The FAO recommends a risk-based approach like the APVMA's extensive, science-based process that assesses the risk that workers who handle chemicals may be exposed to. The comprehensive information provided on the label to users enables the APVMA to satisfy itself that the workplace health and safety, trade, consumer and environmental impacts are being effectively managed when products are used in accordance with label directions. Instructions, hazard statements and warnings on APVMA approved labels are tailored to a specific product and a specific use, unlike GHS hazard statements, which are by their very nature quite broad and general given that they are applied to products that may be used for a range of purposes.

There is no justifiable reason why Australia should adopt an approach to agricultural chemical product labelling that is a "last resort" for developing countries that do not have the scientific, financial or technical resources to conduct a local risk assessment.

APVMA labels should receive the same recognition that TGA labels receive, for the same reasons

APVMA assessments of packaged-for-sale agricultural chemicals should retain the same recognition granted to the TGA for pharmaceutical chemicals, for the same reasons. They are both tightly regulated by dedicated, expert, government authorities, with hazards identified, risks assessed and approved uses prescribed on the label. APVMA approved labels for agricultural chemicals and TGA approved labels for pharmaceutical chemicals operate in the same fashion. They are designed to communicate how to use the product safely following an expert risk assessment. SWA has been unable to explain why TGA approved labels are recognised as compliant with WHS, whereas APVMA approved labels are not.

In addition to APVMA's regulated labels, CropLife Australia's members contribute more than $13 million each year to industry stewardship activities to ensure the safe and sustainable use of their products throughout their lifecycle, including proper training for distributors and workers. In addition to industry stewardship programs such as ***drum****Muster* and ChemClear®, CropLife's wholly owned subsidiary Agsafe operates an Accreditation and Training program that ensures employers and workers that come into contact with agricultural chemicals through manufacture, wholesale and distribution chains have the necessary procedures in place to protect against adverse impacts.

Barrier 2: The costs of registering agricultural chemical products are prohibitive and act as a regulatory barrier to commercialisation

CropLife's recent criticism of the APVMA and the legislative reform process has been exclusively regarding efficiency, not the outcomes of their assessments and reviews. Efficient and effective regulation is essential to support an innovative, productive and sustainable agricultural industry in Australia. However, the regulatory burden of an inefficient mandatory regulatory system is not without consequence. In addition to raising costs and delaying introduction of innovative new products, excessive regulation increases the pre-market barrier for new products, meaning that fewer tools for farmers are ultimately registered and approved for use. Where the cost of registering a product or new use pattern exceeds the likely economic return associated with the product or new use pattern, a company will not generally make the necessary investment to register that product. This problem is compounded in Australia where the size of the Australian agricultural chemical market is one tenth the size of the United States, however, the cost of regulation is three times higher.

This is a well-recognised problem in a number of smaller and specialty products where the market size does not justify the necessary investment in data generation and registration costs by a registrant.

The Minor Use and Speciality Crops program, with initial funding by the Australian Government of $8 million, will coordinate and subsidise necessary research to support minor use of agricultural chemical products.

The Government's mandatory regulatory system results in an excessive entry to market regulatory burden for crop protection products, creating a market failure. This failure comes from the fact that the small volume of sales of products for specialty and minor uses does not offset the high costs associated with registering those products or extending labels to include new uses for existing products. A lack of registered pest management tools means that glass ceilings are placed on these potentially high profit crops. The way to permanently remove this glass ceiling on specialty producers and deliver a bonus to the nation's farming sector is for the Australian Government to continue to invest in the Minor Use and Specialty Crops program.

The Government's initial $8 million commitment to improve access to chemicals for Australian farmers, if utilised properly, will be a profitable investment in Australia's agricultural sector and will help to ensure Australian farmers have access to the same products as their overseas competitors, creating a more diverse and productive sector. Similar programs in the United States were established over 50 years ago and have demonstrated that every dollar invested in a minor use program generates a net return to the US economy of US$550. Targeted investments would also leverage complementary and collaborative investments from users and registrants.

Not only will the Minor Use and Specialty Crops program increase the productivity of Australian agriculture, it stands to enable more environmentally friendly pest management practices. Accessibility to modern, target-specific chemicals can reduce the excessive use of older, broader-spectrum chemicals. The Minor Use and Specialty Crops program also encourages more investment in developing these products.

A lack of pest and weed control options has a number of consequences. Farmers may be forced to rely on a permit system that is not ideally suited to facilitating the development of new uses on product labels. Should a farmer not have access to a registered or permitted product, they may be forced to rely on some state legislation that may in some circumstances allow 'off-label' uses. Off-label uses are not risk assessed. Some off-label uses may therefore result in unacceptable risks to users, consumers, trade or the environment. For these reasons, CropLife does not support off-label use of agricultural chemical products.

CropLife promotes improved harmonisation of state control of use regulations in Australia to remove duplication and inconsistencies, and to reduce unnecessary costs to industry. CropLife members find it difficult, confusing and costly to meet the multiple regulatory requirements of all the jurisdictions in Australia. The Minor Use and Specialty Crops program will enable registration of chemical products for use on minor and specialty crops, thereby reducing the need for off-label uses and providing a platform by which national harmonisation could occur.

A lack of available pest and weed protection products provides a significant barrier to the development of new agricultural industries. New crops are less likely to be commercially cultivated for domestic and export markets if there are no options for pest control. Horticultural crops in particular face challenges as the smaller areas under production often make it uneconomic for registration of new chemical products.

The consequences are not limited to minor crops. Major commodities such as wheat and barley can still be susceptible to minor pests and diseases that are not significant enough to justify investment by registrants to extend labels or develop new control technologies. Pests may not always be a problem for a particular crop, or unusual and unexpected weather conditions in a particular season may lead to new pest and disease pressures.

The small size of Australia's crop protection product market on a global comparison means that the implementation of this initiative is vital so that Australian agriculture is assured access to the latest innovations from the plant science industry and their full range of uses.

Appropriately funded, the Minor Use and Specialty Crops program can safeguard Australian agriculture by increasing its productivity and diversity. Ensuring that farmers have access to adequate crop protection technologies can also facilitate:

- Development of new industries growing new crops for domestic and overseas markets
- Agricultural development of new regions for new crops as pest issues can be sustainably controlled
- Ongoing sustainable production within existing farming systems as new tools facilitate better, more effective and long-lived resistance management strategies.

Critically, support for minor uses can reduce risks to users, consumers and the environment from off-label use. It will also minimise reliance on APVMA issued permits increasing its capacity to provide high quality risk assessments and registrations.

CropLife estimates that total funding of about $45 million spread over four or five years would be the likely requirement for a full program.

If structured properly, such a program would attract further investment from crop protection product companies, grower groups and Research & Development Corporations that would deliver an even better value proposition for the Australian taxpayer and deliver even bigger returns to the Australian economy.

What is essential is that the program is structured so that the funding provided by government goes directly to correcting the market failure caused by a mandatory regulatory system and not simply absorbed in administrative costs by the Department of Agriculture or the APVMA. Funding must generate real outcomes that deliver more registered uses of crop protection products that assist farmers improve farm output or facilitate new crop opportunities.

Successful development and implementation of a fully funded minor use program would represent one of the key reforms to drive productivity and efficiency in Australian agriculture.

Barrier 3: Prohibitive cost recovery arrangements from government regulators leads to inequity and reduces Australia's agricultural productivity and competitiveness

The crop biotechnology industry is subjected to significant duplication of regulation between the three main regulators – the Office of the Gene Technology Regulator (OGTR), the Australian Pesticides and Veterinary Medicines Authority (APVMA) and Food Standards Australia New Zealand (FSANZ). This duplication has significant cost and resource implications both for applicants and government.

Currently, the cost of the APVMA risk assessment is cost recovered from applicants, whereby the OGTR risk assessment is paid for through government appropriation funding. With the possibility of cost recovery for the OGTR currently under review by the Department of Health, there is the risk that if implemented, applicants could be 'double-charged' for what is effectively the same risk assessment. Like any regulatory cost in this sector this would eventually be passed onto growers and eventually consumers in the form of higher food prices.

A recent ABARES report[24] found that "Australia's regulatory environment governing the path to market of genetically modified food crops continues to impose an unnecessary burden on many agricultural businesses through inconsistent regulation and lengthy decision-making." The report concluded "the Australian Government could play a coordination role in negotiating for a shorter, well-defined regulatory path to market."

- *APVMA*

  Currently, almost all resources for the APVMA (with the exception of a nominal amount to fund some minor use permits) is cost recovered from applicants through a mixture of fees and levies. Rather than ensuring that the APVMA remains efficiently funded to service its functions, cost recovery has resulted in the APVMA increasing its funding at the same time as its performance in determining applications has declined. Consistent, secure and ongoing funding arrangements have precluded any significant productivity or efficiency enhancements by the regulator.

  CropLife does not accept the contention that the current cost recovery arrangements result in any compromise of the integrity or independence of the regulator or the decisions that it makes. CropLife accepts that cost recovery is an important and appropriate tool to recover the costs associated with the APVMA's risk assessment and registration functions. That stated, CropLife accepts that an equally strong and valid argument might be made for the APVMA to be fully funded though general revenue.

  While CropLife accepts the need for cost recovery, different elements of the APVMA's functions may be considered separately. CropLife does consider there may well be a difference between the registration and assessment functions of the APVMA and the monitoring, compliance and enforcement functions. The significant public benefit enjoyed by consumers and the environment from assurance about the safety, quality and integrity of the regulatory system justifies consideration of the appropriate level of public funding.

  CropLife considers that despite the fact that the APVMA is a cost recovered agency, it should be subject to the same productivity dividends as other government agencies. Indeed, a more equitable split between cost recovered and government funding should encourage the APVMA and the Department of Agriculture to seek out and implement genuine efficiency and productivity reforms.

  CropLife considers an appropriately funded regulatory scheme should reflect the commitment of all interested parties to enforcing the regulatory scheme. Increasing the public resourcing for compliance and enforcement would represent a significant increase in the Government's commitment.

[24] Gibbs C, Harris-Adams K and Davidson A, 2013, 'Review of Selected Regulatory Burdens on Agriculture and Forestry Businesses', ABARES, Canberra.

- *Food Standards Australia New Zealand (FSANZ)*

In June 2012, FSANZ released an industry consultation paper indicating they intended to increase their cost recovery fee for assessment of applications by an average of 57 per cent (a cost increase that would have amounted to twenty five time's inflation). Such an exorbitant and unprecedented increase, should it have proceeded, would have had an immediate negative effect on the competitiveness and productivity of Australia's food sector. This proposal would have made the regulatory cost in Australia, on a per capita basis, over five times more expensive than any other country in the world to seek regulatory approval for a GM food or food ingredient.

CropLife also notes that in spite of the fees charged by FSANZ, applicants receive nothing in the form of data protection in return. Studies submitted by applicants for use in the assessment process, other than those deemed confidential business information, become available for use by anyone, including overseas competitors.

Given the relatively small size of the Australian market in global terms, if the cost of doing business in Australia becomes prohibitive, CropLife member parent companies may decide to pull out of the Australian market altogether, resulting in a major stifling of plant science innovation in this country and a concomitant loss in productivity for Australia's farmers. Maintaining the ability for Australian farmers to access the latest innovative tools in plant science will be essential if we are to secure a safe and nutritious food supply for both Australia and the rest of the world.

It is clear to CropLife that FSANZ had not considered the serious and significant impact that such increases in cost recovery fees would have had on both private and public sector applicants and the concomitant significant disincentive to innovation.

Barrier 4: The threat to efficient and effective regulation of crop protection products should the APVMA be merged into a larger regulatory agency that lacks specific focus on the agricultural sector

Community confidence in the Australian Pesticides and Veterinary Medicines Authority (APVMA) is crucial if Australian farmers are to maintain and gain access to the necessary agricultural chemical tools they need to be productive.

The APVMA is a globally respected, scientifically and technically sound regulator of agricultural chemicals. The Authority is actively engaged in programs of the Organisation for Economic Co-operation and Development to share assessment of new agricultural chemicals through international partnerships with pesticide regulators in the United States, Canada and the United Kingdom. The Authority's expertise and scientific credibility are well recognised within Australia, throughout the Asia-Pacific and globally. While CropLife has from time to time, constructively criticised the APVMA publicly, that criticism has always been restricted to the regulator's efficiency and not its technical competencies.

It is essential that Australia maintains the APVMA as a regulator that is independent and has scientific and technical competency through continual improvement. The APVMA must base its registration decisions purely on the legislative and regulatory framework provided for in the Agricultural and Veterinary Chemicals Code Act 1994 and must remain free from undue influence from activist groups, industry and other third parties, as well as political interference. This is vitally important to ensure maintenance of community confidence in the regulation of crop protection products for the nation's farming sector.

It is crucial that the core regulator for Australia's agricultural and farming sector remains in the Agriculture portfolio.

The proposal in the National Commission of Audit Report released in May 2014 to merge the APVMA and the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) and place it in the Industry portfolio will do nothing to improve performance and may serve to cloak the real inefficiencies.

The Australian Government is to be commended for its commitment to improve efficiency and effectiveness of government services and policy advice. It's important, however, that the solutions target the real problems and structural reform of NICNAS and the APVMA, though consolidation will only serve to conceal the administrative and management inefficiencies that exist.

CropLife strongly posits that under no circumstances should an agricultural industry regulator be placed in the Industry portfolio. The Department of Industry's record in driving any level of reform in chemical regulation over the last few years is non-existent and NICNAS' operations have been affected by this failure. In contrast, the APVMA is in the midst of a reform that is about delivering more efficient and effective services, which will mean all that work would be undone.

Moving a new amalgamated body from the Agriculture portfolio to the Industry portfolio poses a threat to the competitiveness of Australia's agricultural industry as it would further undermine the APVMA's purpose, which is to regulate the use of agricultural chemicals and veterinary medicines.

It's important to Australia's agricultural sector and future competitiveness and productivity that its regulator is able to give priority to agricultural considerations. The APVMA does need to reform its administrative and management functions to improve efficiencies however, amalgamating it with NICNAS and transferring it to the Industry Portfolio will not solve these problems.

CropLife encourages the Government to consider the 2008 Productivity Commission Research Report on Chemicals and Plastics Regulation[25] that assessed the possibility of consolidating chemical assessment regimes, including the full amalgamation of NICNAS and the APVMA. It concluded that the disadvantages of consolidation outweighed the benefits and would put into jeopardy some of the APVMA's world-class risk management functions. The Productivity Commission Research Report still provides the roadmap for the appropriate regulatory reform in the agricultural sector and its recommendations should be implemented before any other reform is undertaken.

[25] http://www.pc.gov.au/inquiries/completed/chemicals-plastics

Barrier 5: The need for further collaboration between government, state government and industry in developing long-term sustainable plans and programs and harmonising control of use regulations

Programs that promote long-term sustainable use of pesticides are crucial for growers to maintain access and effectiveness of crop protection products (CPPs), particularly as old and obsolete products come off the market and resistance neutralises the effects of currently available chemistry.

CPPs are currently relied upon to increase global food production by between 30 and 50 per cent[26]. With the predicted increase in the world's population to 9.6 billion by 2050, and the required increase in global food production of 70 per cent, the loss of effective agricultural chemistry to resistance is of greater concern than antibiotic resistance in human medicine. Add to this the fact that it now requires the assessment of more than 140,000 compounds and expenditure of more than US$250 million over a 10 year period to bring just one new successful crop protection product to the market, long-term sustainable pesticide resistance management plans and programs are essential.

Collaboration between government and industry in the promotion of resistance management strategies developed by CropLife Australia and industry lead sustainable use practices such as Integrated Pest Management is critical. Supporting industries to develop and introduce newer crop protection products that are better targeted to Australian pests, climates and crops is vital to increase the number of available control options, therefore extending the effective life of available chemistry, and helping Australia play its part in addressing global food security. Collaboration between government and industry in this area will also perfectly complement a fully funded Minor Use and Specialty Crops program.

Ensuring farmers have access to adequate crop protection technologies can also facilitate:

- Development of new industries growing new crops for domestic and overseas markets
- Agricultural development of new regions for new crops as pest issues can be sustainably controlled
- Ongoing sustainable production within existing farming systems as new tools facilitate better, more effective and long-lived resistance management strategies
- A significant reduction in the need for off-label uses, which will provide a platform by which national harmonisation of state control of use regulations could occur.

CropLife promotes improved harmonisation of state control of use regulations in Australia to remove duplication and inconsistencies, and reduce unnecessary costs to industry. CropLife members find it difficult, confusing and costly to meet the multiple regulatory requirements of all the jurisdictions in Australia. Some state legislation in certain circumstances allows 'off-label' uses that are not risk assessed. Some off-label uses may therefore result in unacceptable risks to users, consumers or the environment.

For these reasons, CropLife does not support off-label use of agricultural chemical products. A comprehensive, publicly funded program for minor uses of agricultural chemical products enables registration of chemical products for use on minor and specialty crops, reducing the need for off-label uses and providing a platform for which national harmonisation could occur.

[26] Deloitte Access Economics, 2013, 'Economic activity attributable to crop protection products' CropLife Australia

Barrier 6: The lack of a nationally consistent regulatory scheme for GM crops to ensure a clear path to market and freedom to operate

Lack of a clear path to market for GM crops acts as an artificial trade barrier

In 2005, the then Australian Bureau of Agricultural Resource Economics (ABARE) reported that Australia's canola growers were suffering an economic loss as a consequence of the state moratoria on the commercial cultivation of GM canola. The report concluded that if the moratoria were to continue, it could result in a loss of $3 billion, in net present value terms, in the period to 2015[27].

Transgenic cotton, soy, maize and canola with productivity enhancing input traits have all been rapidly adopted globally[28]. This rapid adoption of these GM crops can be expected to force downward pressure on their prices in international markets. Given that Australian farmers also compete in these markets, barriers to future Australian commercialisation of GM crops will mean that Australian farmers will receive a reduced benefit from their crop and a concomitant reduction in profit[29]. By facilitating a clear path to market for future crop biotechnology traits, the Australian Government would be in the best position to ensure that Australian farmers can remain competitive on the world stage.

A more recent ABARE report in 2008 indicated that the estimated economic benefit to Western Australia from adopting GM canola from 2008-09 for the following ten years would be $180 million in 2006-07 dollars. Over the same period, the benefit to New South Wales farmers (excluding those in the Murray Catchment Area) was estimated to be $273 million and South Australian farmers would receive a benefit of $115 million. While farmers in New South Wales, Victoria, Western Australia and Queensland had the opportunity to be one of the 18 million farmers globally growing GM crops in 2013, South Australian and Tasmanian farmers are **still** denied access to this technology.

In Australia, the Gene Technology Regulator is responsible for approving any dealings with live and viable genetically modified organisms (GMOs). Food Standards Australia New Zealand (FSANZ) is required to approve any genetically modified (GM) food ingredient and the Australian Pesticides and Veterinary Medicines Authority (APVMA) regulates those GM crops with inbuilt pest protection. The GM canola and GM cotton crops that are grown in Australia have passed all of these regulatory assessments.

The *Gene Technology Act 2000* (Cth) was intended to establish a national system of regulating GMOs. Despite this intention, most states have implemented legislation to address 'marketing concerns' that are neither consistent nor transparent. This unclear path to market was well demonstrated in 2003 when the Gene Technology Regulator approved GM canola for commercial release and all the canola growing states immediately implemented politically motivated moratoria on commercial cultivation of this crop. This led to years of delays, which reduced the management options for Australian farmers and created real uncertainty about the future of GM crops in Australia. State bans also cost food producers and consumers, with one analysis concluding that nationally, the bans on GM canola cultivation cost growers $157 million per annum[30].

New South Wales, Victoria and Western Australia now allow the commercial production of GM canola, however, this was only allowed after at least a five year delay following federal regulatory approval. It is not clear if such a delay will be repeated if future GM crops are introduced in Australia. Several states still have legislative bans on GM technology, maintaining vague 'market considerations' legislation, even in states where GM canola is now commercially produced. CropLife notes that the New South Wales Government announced on 1 June 2011 that it would be extending its *Gene Technology (GM Crops Moratorium) Act* until 2021, 25 years after GM cotton was first commercially grown in that state.

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27 Apted S., McDonald D., Rodgers H., 2005, 'Transgenic Crops: Welfare implications for Australia' Australian Commodities, vol. 12, no. 3

28 James, Clive 20142015. 'Global Status of Commercialized Biotech/GM Crops: 2013'2014'. *ISAAA Brief No. 4647*. ISAAA: Ithaca, NY.

29 Apted et al 2005, *Op. Cit.*

30 Norton R.M., Roush, R.T., 2007, 'Canola and Australian Farming Systems 2003-2007'.

South Australia introduced the *Genetically Modified Crops Management Act 2004* (SA) to ensure that the cultivation of GM crops was regulated in that state. On 8 February 2008, against the advice of its own scientific advisory committee, the South Australian Government decided to extend its moratorium on growing GM canola in South Australia beyond the end of April 2008 when the regulations were due to expire. The South Australian Government has even gone beyond marketing concerns and banned the transport through their state of sealed bags containing GM seed. This intervention means that there is no clear path to market for the developers of GM crops in South Australia, even when licence applicants have satisfied the requirements of the Commonwealth *Gene Technology Act 2000* it has been clearly demonstrated in other states that effects on trade are negligible.

In January 2014, the Tasmanian Government also extended its moratorium on GM crops in direct contradiction to both consultants' reports sourced by the Government on the issue of market benefit from GM-free status[31,32]. With both reports concluding there was little to no indication of a price premium generated by GM free status, the decision was clearly political and not based on actual scientific and economic evidence[33]. Without access to the latest technologies, Tasmanian farmers will miss out on the environmental and economic benefits GM crops are already bringing to mainland states and farmers across the globe. The Government's own commissioned report states that over the past decade, Tasmania's agricultural sector has suffered a $40 million net farm-gate loss due to this moratorium[34]. The situation in Tasmania is a prime example of how important decisions that affect the competitive future of an entire sector, with far-reaching implications for the environment and the state economy, should not be made solely on political and ideological grounds.

GM crops are intensively studied and rigorously regulated in Australia - all regulation should be commensurate with the associated risk, cost and benefit to the community. CropLife supports the continued use of science-based risk assessment as the basis for sensible decision making. It is a key principle of good governance that governments should only intervene in a market where there is demonstrated market failure. State government moratoria on commercial production of GM crops have, however, never identified any such failings.

The anti-competitive nature of regulation of GM crops by state governments creates uncertainty that acts as a major disincentive for private investment and as a brake on technological innovation in the sector. This uncertainty is exacerbated by the fact that the legislation is often written so that it prevents the relevant Minister from granting a licence unless certain conditions are met. It does not, however, compel the Minister to grant a licence if an application meets these same conditions. As a result, there remains a very real possibility that a company would invest significantly in bringing a technology to market in Australia with data to address all the federal and state regulations and still be unable to sell its product commercially.

This sort of significant disincentive to private investment in Australian agricultural biotechnology is counter-productive if Australia wishes to have a modern, sustainable and profitable agriculture sector in the future. Perhaps ironically, this situation is also a large threat to the otherwise highly successful public investments by state governments in developing GM crops.

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31 FreshLogic 2013, *An attitudinal assessment of key domestic market gatekeepers to gauge perception of and attitudes towards Tasmania, GM crops and food grown in areas that allow the cultivation of GM food and non-food crops*, Hawthorn VIC.

32 Macquarie Franklin 2012, *Market Advantage of Tasmania's GMO-free Status*, Devonport TAS.

33 http://dpipwe.tas.gov.au/Documents/Final%20Report_v.final_16-12-13.pdf

34 Macquarie Franklin, *Op. Cit.*

The failure to implement a consistent national regulatory scheme has created crippling uncertainty in the agricultural biotechnology industry in Australia and completely undermined the effective regulation of GM crops. Both of these issues need to be addressed if Australia is to continue to have a competitive and productive food industry with safe and affordable food choices available to everyone.

The Australian Government should recognise that evidence to date has demonstrated that GM crops do not pose any risks to human health and the environment that cannot be identified and managed, and consequently the state and territory moratoria on these crops is anti-competitive and in no way commensurate with the risk.

Barrier 7: Australia's National Standard for Organic and Biodynamic Produce is out of step with the rest of the world and inconsistent with existing Australian Government policies

Australia's current National Standard for Organic and Biodynamic Produce (National Standard) does not align with international standards and is inconsistent with other Australian Government policies regarding food labelling and thresholds. This is both a policy and regulatory matter that needs immediate action by the Government.

The National Standard prohibits a number of materials and substances from use in organic systems, including pesticides and GM crops. The majority of prohibited products and techniques are permitted if they are accidently introduced at a low level. However, organic certifiers currently implement a zero tolerance regime for GM crops being present on organic farms or in organic products. This is both out of step with the principles the Government brings to other areas of regulation relating to biological systems and entirely out of step with regulations in other similar jurisdictions. By way of example:

- In the United States and Canada, organic certification is 'process-based' and relies on organic growers having processes in place to meet the standard. The presence of prohibited residues/crops does not automatically invalidate the certification of an organic farmer.
- In Europe, organic standards are product based and permit up to 0.9 per cent of approved GMOs in organic food products.
- Guidelines for organic production that have been produced by Codex are process-based as in the United States and Canada.

It is noteworthy in what is a highly competitive market that products approved under these international standards can be imported into Australia as 'organic' products, despite the fact they could contain the adventitious presence of GMOs at very low levels.

Australian organic producers are being forced to certify their produce using an entirely product based system that has no threshold for adventitious presence. Thresholds recognise that there could be some accidental mixing of GM commodities and non-GM commodities due to the reality of agricultural supply chains and global trade.

The current National Standard is also out of line with Australian Government policies regarding food labelling, which allow for a 1 per cent threshold for the accidental presence of an approved GM food ingredient. This threshold recognises that occasionally, accidental presence of a GMO will occur at very low levels and low level thresholds prevent this occurrence from becoming either a trade irritant, or a dispute between neighbours. Thresholds also exist in virtually every Australian grain standard for the unintended presence of a range of things, including insect legs, cracked grain, weed seeds and other crops.

CropLife considers it critical for Australian agriculture and for the Australian agricultural biotechnology industry, that the National Standard is modernised to accommodate low level accidental presence of GMOs. The current situation undermines both organic and GM crop farmers, the credibility of Australian Government regulation and the coexistence framework of the Australian farming sector.

Activist groups in Australia are attempting to utilise the organic marketing standards and the associated threat of legal action as an anti-competitive tool against those growers who choose to adopt modern agricultural innovations. For example, in the recent case of *Marsh v Baxter*,[35] the organic farmer, Mr Marsh, sought a permanent injunction to restrain Mr Baxter from ever again growing a GM canola crop in paddocks adjacent to Mr Marsh's property.

[35] [2014] WASC 187

In what was a victory for common sense, Justice Martin of the Supreme Court of Western Australia held that Mr Baxter was not to be held responsible as a broadacre farmer merely for growing a lawful GM crop and choosing to adopt a harvest methodology that was entirely orthodox in its implementation. Justice Martin also held that the reaction of the organic certification body was unjustifiable to what had occurred. This decision was subsequently upheld at appeal in September 2015.[36]

To avoid activist groups seeking to promote further anti-competitive behaviour through abuse of Australia's organic marketing standards, there is an urgent need for direct Government intervention to promote competitive behaviour both domestically and with regard to imported certified organic products.

[36] [2015] WASCA 169

Barrier 8: The lack of international regulatory harmonisation and lack of participation in global fora has resulted in overregulation and unnecessary regulatory costs

Significantly reducing unnecessary regulatory costs is a necessity for Australia's agricultural industries and is at the core to boosting competitiveness.

The Australian Government's Industry Innovation and Competitiveness Agenda put the spotlight on the need to take advantage of international risk-based assessment work that is duplicated by Australian regulators. It is encouraging that the Australian Government continues to deliver on its promises to streamline Australian regulation and remove unnecessary red tape.

The announcement that systems, services or products that have been approved under a trusted international standard or risk assessment should no longer need additional requirements for approval in Australia is a well-considered and imperative step forward in policy that recognises the realities of the global marketplace for the plant science industry.

Unnecessary costs and delays have direct impacts on plant science innovation, domestic productivity and international competitiveness. Now the pressure is on government departments, agencies and regulatory authorities to culturally adopt the newly announced policy in their operations.

Fully implemented, this latest policy will markedly improve Australian regulation and deliver real benefits to the Australian farming sector. It represents a modern policy approach that is in step with the realities of the global marketplace.

Overregulation leading to less innovation in the agricultural biotechnology industry acts as another barrier to commercialisation.

Low level presence (LLP) refers to the unintended presence, at low levels, of minute amounts of genetically modified (GM) plant material that has been approved in at least one country but not necessarily in the importing country.

Global approvals and acceptance for GM crops are varied. Even between countries with well-established regulatory systems for gene technology, approval timelines and duration of approvals may differ. These differences can lead to approvals among key trading countries occurring at different times, with potentially unnecessary negative impacts on trade.

It is well recognised in the agriculture and food industry that 100 per cent product purity is not possible because of the nature of biological systems and the practical limitations of supply chains. The potential for LLP occurs when importing countries maintain zero tolerance import policies for GM products not yet approved. This represents a critical trade policy issue.

For example, an importing country may discover in a grain shipment the unintended presence of individual grains derived from GM plants that are not yet approved in the country, putting the whole shipment at risk of being refused and turned back. Such situations are further compounded if an importing country does not have a process in place to manage LLP occurrence.

In the future, incidents of LLP may likely increase as the pipeline for new GM crops accelerates globally. Countries such as China, India and the Philippines are close to commercialising new GM crops that, although intended for domestic use, could end up in shipments destined for international trade and enter Australia as the unintended LLP of a GM crop that has not been approved either for food, feed or environmental release. The reverse situation may also occur concerning crop exports from Australia to many markets (CropLife member companies seek premarket approval for their products in all major importing countries, but other companies or public institutions developing GM products may not follow the same path).

CropLife Australia supports global adoption of science based risk assessment approaches to LLP policy to avoid unnecessary economic costs (caused by, for example, recall of grain shipments due to comingling of GM grains that may be unapproved in the destination jurisdiction) and improve consumer confidence in our food supply chain and regulatory framework.

In light of the fact that in agriculture, as with all biological systems, 100 per cent product purity is impossible and as agricultural biotechnology continues to be rapidly adopted around the world and trade in GM grains and seed increases, Australia's current legislation that imposes 'zero tolerance' to LLP will be unsustainable. The Australian Government will need to examine the impact of its current legislation in relation to LLP and develop specific policies to recognise its trading partners' systems for risk assessment and management, particularly in relation to import of GM-derived plant materials (grain or seed). Enhanced communication, data sharing and recognition of regulatory equivalence between and among global regulators could minimise the differences in approach and timing of approval, and reduce the time required to conduct risk assessments and make management decisions in countries where LLP situations may occur.

Australia has robust gene technology and food safety regulatory systems whose objectives are to identify and manage risks to human and animal health and the environment. CropLife Australia supports enhancing the existing science-based framework by encouraging the Australian Government to recognise that some GM crops grown and approved overseas may not yet be approved for environmental release or food and feed use in Australia, and to develop a practical and pragmatic LLP policy that reduces potential trade impacts of a future LLP incident without undermining our current regulatory protections.

Australia has opportunities for enhancing agricultural exports and new market access through international engagement on plant science.

Opportunities exist for Australia to contribute to the global conversation on plant science and influence international policies that facilitate modern farming technologies and methods in Australia. It's imperative that regulatory agencies and government departments are funded adequately to facilitate participation in significant international fora.

Australia participates in the development and implementation of many international agreements dealing with plant science, biological diversity and genetic modification. Australia is already a signatory to, and has ratified the Convention on Biological Diversity, which aims to conserve biodiversity, ensure sustainable use of biodiversity and the fair and equitable sharing of the benefits arising from the use of genetic resources.

Further opportunities exist including:

- International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA or "International Treaty") – Australia signed and ratified
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity (BSP or "Biosafety Protocol") – Australia not signed
- Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity (Nagoya Protocol) – Australia signed and currently determining ratification process

Working with industry, government can take best advantage of the opportunity for involvement in the development and implementation of relevant treaties and protocols to improve market access to new technologies and farming methods in Australia.

To prevent precedents being set in these international fora that could adversely affect or conflict with Australia's domestic policy, it is important that the Government work with industry to ensure our voice (Australia's) is heard at the international level.

CONCLUSION

The Terms of Reference for this Inquiry draw particular attention to role of technology in increasing agricultural productivity in Australia and the potential barriers to adoption of that technology. CropLife submits that the inclusion of crop protection and crop biotechnology products is essential to the development of any government agricultural policy that seeks to be productive, profitable and innovative, and avoid unnecessary 'red-tape' or regulation that is not commensurate with risk.

Maintaining the economic, environmental and social sustainability of agricultural production systems will not be achieved by limiting the options for farmers to manage their businesses. Each individual farm faces specific challenges in terms of climate, soil type, farming system, demography and economy. These circumstances all have an impact upon the choices available to farmers to manage their farms. For example, the sustainability challenges faced by a wine grape grower in McLaren Vale on the urban fringes of Adelaide will be different to a broadacre grains farmer in Western Australia.

There is a wide variety of farming systems and circumstances throughout Australia. Agricultural productivity will only be delivered by enabling farmers to make management choices and decisions that best suit their individual circumstances. For some farmers, this may mean adopting organic production systems to leverage high value specialty markets. For other farmers this may mean adopting innovative new agricultural chemical products or genetically modified crops for agronomic purposes. National harmonised regulatory settings must continue to allow farmers to make decisions in the best interests of their own business. This will mean allowing farmers to adopt any or a combination of farming systems. Coexistence of farming practices is essential to ensure Australia's diverse farming heritage continues in harmony, as it always has.

Over the next 100 years, growing enough food for people to eat will challenge all countries. Australia, as one of the few large food exporting countries, has an unprecedented opportunity to take the lead in innovating to produce safe, nutritious and affordable food for domestic and export markets. This Inquiry must recognise the important role Australian exports play in supporting food security throughout the region.

As farmers face increasingly extreme and unpredictable climatic conditions, stressed natural resources and shrinking available arable land, Australian farmers need access to the same safe, effective tools and technologies as their international competitors to meet food security challenges and maintain or increase yields into the future.

Crop protection products and genetically modified crops are currently major contributors to the productivity and sustainability of Australia's food production systems. The benefits they generate for farmers, other users, consumers and the environment far outweigh any real or imagined risks associated with their adoption or use. These tools are currently assisting to produce nutritious, healthy, affordable and disease-free food for Australian and overseas consumers.

CropLife and its members are committed to supporting all farming systems in Australia by providing farmers with the innovation, technologies, tools and products they need to ensure sustainable and profitable farming practices. Providing for access to reliable, safe, effective and efficient new technology crops and crop protection products will build productivity, sustainability and resilience into all Australia's agricultural systems.