

# Monsanto submission to NSW State Government review of the Gene Technology (GM Crop Moratorium) Act 2003

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## Introduction and general comments

Monsanto is an agricultural company; farmers around the world use our innovative products to address on-farm challenges and to reduce agriculture's overall impact on our environment.

We consider the moratorium, imposed to regulate the cultivation of GM canola in New South Wales to be unnecessary. We are committed to the responsible development and stewardship of new technologies and recommend that once a product is found to be safe under the current Federal regulatory system, markets and their commercial participants are best placed to assess any market risks and benefits of new technologies.

State government moratoriums like that of New South Wales discourage investment and impede research and development necessary for improvements in agriculture.

The global adoption of GM crops continues to grow, with a 13% increase from 2005 to 2006 (12 million hectares planted in 2006)<sup>1</sup>. This is a clear demonstration of the social, economic and environmental benefits being realised by millions of farmers and their customers around the world.

Further debate of the economics of GM canola production is not justified – this is a matter for growers and the market to resolve.

Australian canola farmers are currently prevented from making this choice and are unable to access GM technology, adversely impacting the long term competitiveness of the Australian grains industry.

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<sup>1</sup> James C (20067) Global Status of Commercialized Biotech/GM Crops: 2007

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**Terms of Reference:**

**1. Assess the expected impacts on marketing, trade and investment for NSW of Extending the Act and maintaining the moratorium orders on the cultivation of GM canola**

It is Monsanto's view that this legislation generates a great deal of uncertainty, discouraging investment in the agricultural biotechnology sector, impeding research and development activities with significant adverse economic impact on NSW. The moratorium on the cultivation of GM canola is a prohibition Act, preventing the market from making its own determinations and stopping farmers accessing the benefits of new technology.

The negative economic impact of the moratoria is supported by ABARE (Australian Bureau of Agricultural and Resource Economics) who in a recent study found an expected \$3 billion loss in gross national product (in net present value terms) over the next 10 years if the state moratoriums remain in place or are extended to other crops.<sup>2</sup>

The current lack of research and development in Australia is viewed as advantageous by international competitors. A report published this year by the Canola Council of Canada states "the continuing moratorium on GM canola is believed to be damaging Australia's long term production competitiveness."<sup>3</sup>

**Impact on farmers**

Growers have choice about where to buy their seed. More than 1,000 separate seed companies supply the commercial seed market globally. Monsanto's market share of seeds is only a small portion of the total seed market.

Farmers are shrewd businesspeople. They only buy products that help them produce a better crop. Farmers have choices when they buy seed, and the reason that farmers buy seeds containing Monsanto's technologies is that these seeds help them be successful.

Australian canola farmers are competing in a global market without access to the technology advances available to their overseas counterparts. This limits their ability to compete in the international canola market.

Growers in countries such as Canada have, for the past decade, experienced benefits such as yield improvements, quality gains, input cost savings, efficiency gains and reduced environmental impact.<sup>4</sup>

Most notably the superior varieties incorporating GM traits offer productivity and profitability enhancements from more effective and efficient weed control, with yield gains of 10-20% over conventional canola and 20% over Triazine Tolerant canola varieties.<sup>5</sup>

This translates directly to a lost opportunity and reduced competitive edge for New South Wales farmers. An extension of the moratorium will exacerbate this loss.

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<sup>2</sup> ABARE *Australian commodities forecasts and issues - volume 13 • number 3 • September quarter 2005*

<sup>3</sup> The Canola Council of Canada (2007) *Canola growing great 2015*

<sup>4</sup> Brookes G, P Barfoot (2006) *GM crops: the first ten years – global socio-economic and environmental impacts*, PG Economics Ltd, UK

<sup>5</sup> Norton R (2003) *Conservation Farming Systems and Canola*, Dr. Robert Norton, University of Melbourne, Avcare

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### Impact on the grains industry

The uncertainty created by moratoria is discouraging investment and research with considerable implications for the broader grains industry. Restrictions on new technology render the industry disabled, hindering growth and continuous improvement opportunities. Unable to capitalise on the production increases, yield increases and quality gains offered by GM canola, the industry's ability to compete in the global market will be obstructed.<sup>6</sup>

A 2003 report by Dr Rob Norton of the University of Melbourne estimated an increase in canola sown of 160,000 hectares if GM canola were adopted; in addition to an increase in wheat production of 64,000 tonnes (wheat following canola has a 20% greater yield than wheat following wheat).<sup>5</sup>

This equates to \$135 million per annum in lost opportunity to the Australian grains industry. This loss impacts not only grain handlers and marketers, but also rural communities, unable to capitalise on the estimated production increases eg. local agricultural product and service providers.

This has flow on effects for employment levels, a slowing of expertise development due to the lack of exposure to, and experience with, GM and limits the capacity for research into innovative solutions that are important in maintaining a competitive advantage in the international grains market.

### Impact on biotech industry

This legislation and consequential ban on GM canola has had a negative impact on the biotech industry in NSW, causing the State to lose a considerable amount of investment which will continue if the moratorium remains. With no clear path to market, research and development into new GM traits outside of cotton in Australia has decreased markedly, limiting variety improvements that overseas farmers have access to.

Notably, 52% of DIR<sup>7</sup> applications made to the OGTR since the implementation of the first state moratorium in 2003 have been for GM traits in cotton, which is not subject to moratoria in the areas where it is grown commercially.

The enhancement of skills and capacity for research and development in the agricultural-biotech sector has been diminished. Ausbiotech, Australia's biotechnology industry organisation, released a report in 2004<sup>6</sup> which cites the following effects of moratoria legislation on the biotech industry:

- a. Reduces investment in biotechnology and other life sciences research and reduces capacity to undertake research and development in Australia. This investment and R&D is essential to the growth and development of the agricultural sector and the broader biotechnology industry
- b. Reduces opportunities for university students to make a career in the agricultural life sciences
- c. Reduces the competitiveness of Australia's farmers while allowing other countries (e.g. Canada) to gain entry into Australian markets
- d. Makes the quest for environmental sustainability more difficult

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<sup>6</sup> Ausbiotech (2004) Backing Innovation: The way forward for Australian agriculture.

<sup>7</sup> DIR = Dealings involving Intentional Release, which covers field trial and commercial release of GMOs.

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- e. Lessens Australia's standing in the international community and puts Australia at risk of future World Trade Organization (WTO) challenges because of the compromise of our science-based regulatory system
- f. Puts future agricultural breakthroughs at risk by diverting research resources into other areas
- g. Compromises the intent of the joint State-Commonwealth regulatory system as agreed by the Council of Australian Governments.

**Impact on Monsanto**

Monsanto's Roundup Ready canola was deemed as safe as conventional canola and approved for commercial release by the Federal Gene Technology Regulator in December 2003. However moratorium legislation left us unable to commercialise this product and, as a result, we suspended our canola investment and research and development program and focused on our successful cotton business.

An environment of uncertainty has been created, making it difficult to make a case for investment in canola or the prospect of a commercial future for GM traits in canola. The potential for change in policy is difficult to predict and it remains challenging to determine future involvement in the grains industry while the moratorium is in place.

This makes the opportunity to explore the possible benefits of GM for traits in other crops, some already grown around the world, unattractive for companies in Australia. We're reluctant to invest or commit resources to other crops until such time as there is a path to market for GM canola.

Monsanto Australia, as part of Monsanto Company, has to compete for research and human resource dollars with other parts of the company. In doing so we are competing with other countries in which there are more favourable commercial environments for agricultural biotechnology. With the moratorium legislation as it stands, Monsanto as a global company has little confidence in investing in Australia outside of cotton. This is discouraging for the many passionate and committed people working to develop and support improvements in farming technology in this country.

**2. *Assess the expected impacts on marketing, trade and investment for NSW of Amending the Act and removing the moratorium orders on the cultivation of GM canola***

Monsanto considers State regulation to be counter-productive. The removal of the moratorium order will allow a path to market for GM canola, however the amended Act will still be cause for great uncertainty. The fact remains that State government will retain the capacity to control market access and the potential for moratoria will remain.

This will continue to discourage investors and impede research and development which will be detrimental to the long term competitiveness of agriculture in NSW and Australia.

**3. *Assess the expected impacts on marketing, trade and investment for NSW of Allowing the Act to expire***

**Impact on farmers**

If the moratorium expires, farmers will have the freedom to make their own decision whether to adopt GM canola or to continue to use conventional canola (or indeed to select the combination of GM and conventional canola that best suits their individual

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circumstances). Those who adopt the GM technology will gain the advantage of fewer cultivations, less pesticide applications, the potential to lower fuel usage with fewer cultivations and pesticide applications, increased yields as well as reduced grain dockage and increased net returns (gross margins) and more sustainable farming practices<sup>5</sup>.

Other varietal characteristics would improve with the reinvestment and recommencement of research and development activities in canola. Farmers' profitability and productivity would be enhanced, along with their ability to compete internationally in the longer term.

Those farmers who choose not to adopt the technology are unlikely to be adversely impacted by the introduction of GM canola. Growers are familiar with managing choice on their farms (separating wheat from barley for example), and there are well established protocols for certified organic farmers to ensure identify preservation. ABARE reported recently that the separation of grains is manageable<sup>8</sup> and that the introduction of GM canola would have minimal, if any, impact on Australia's organic canola production, if it were introduced commercially<sup>9</sup>.

A preliminary analysis in the report by Rob Norton suggested GM canola will have up to a \$170 per hectare gross margin advantage over conventional canola<sup>5</sup>; a significant increase in profitability to the farmer.

**Table: Summary of approximate benefits estimated with the scenario presented concerning the introduction of GM canola<sup>5</sup>**

Factor	Increment	Amount	Value canola @\$400/t
Earlier sowing	5% where conventional varieties are replaced	0.08 t/ha over 205,000 ha = 16,000 t	\$6 million
Improved weed competitiveness	8% where conventional and TT varieties are replaced	0.10 t/ha over 520,000 ha = 52,000 t	\$21 million
Yield benefit over TT varieties	20% where TT varieties are replaced	0.21 t/ha over 320,000 ha = 67,000 t	\$27 million
Increase in oil content over TT varieties	2% oil where TT varieties are replaced	+3% value of 342,000 t	\$4 million
Increase in canola area	160,000 ha in dry areas	1 t/ha = 160,000 t	\$64 million
Rotation benefit in next wheat crop	160,000 ha with 20% yield increase in wheat crop	0.4 t/ha (wheat @ \$200/t)	\$13 million
<b>Total</b>		<b>295,000 t of canola, plus 64,000 t of wheat</b>	<b>\$135 million</b>

The Canadian Canola Council reports that the direct economic gain to growers of the adoption of GM canola from 1997 to 2000 was within the range of C\$144 and C\$249 million.

<sup>8</sup> [ABARE media release issued December 2006 "Separation of GM grains is manageable"](#)

<sup>9</sup> Apted, S. and Mazur, K. 2007, Potential Economic Impacts from the Introduction of GM Canola on Organic Farming in Australia, ABARE Research Report 07.11.

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Note in the Appendix a Monsanto report for the 2004 GRDC Crop Updates. This report is based on 2003 trials data from across Australia and details the benefits of Roundup Ready canola for farming systems in WA which can also be applied to other canola growing regions.

Australia's own cotton industry adopted GM technology in 1996. A 2003 study by the Centre for International Economics confirms GM cotton varieties have contributed \$4.9 billion in net value to Australia.<sup>6</sup> GM cotton varieties now make up 92% of commercial cotton production in Australia<sup>10</sup>.

#### **Impact on grains industry**

The anticipated economic gains to the industry would be based on the collective benefit to farmers, including yield improvements, as well as increased oil content and an increase in the cultivated area of canola. This would also lead to increased wheat production (see TOR 1).

As previously noted, GM canola will enable an estimated increase of 160,000 hectares of canola production in addition to an increase in wheat production of 64,000 tonnes. This suggests a \$135 million advantage per annum in adopting GM canola.

The grains industry has relied on innovation and advances in technology to secure its global competitiveness, and recognises farmers and the market require access to GM technology to remain at the forefront.

The grains industry has the capacity to deliver and manage the introduction of GM canola and is ready to move ahead with the commercialisation of approved GM canola varieties. This position is agreed and endorsed by the major stakeholders in the grains supply chain as detailed in the recent report prepared under the Single Vision Grains Australia process<sup>11</sup>.

Cotton is currently the only broad scale agricultural industry with access to GM technology and poses an excellent example of how an industry can embrace this technology, regulate itself effectively, and maintain market freedom and choice.

Monsanto's business will only thrive if our products are developed and used responsibly and it is for this reason we are committed to stewardship and working in cooperation with industry to ensure sustainable practises, as demonstrated in the case of cotton traits.

#### **Market choice and successful coexistence**

Since 1996 the global adoption of GM crops and international trade in their products has increased each year<sup>1</sup>. The evidence that approved GM technology is safe and can be successfully managed by Australian and NSW farmers and the grain supply chain is clear from the use of GM technology in cotton seed as stock feed.

Australia imports 25,000 tonnes of soybean oil and 300,000 tonnes of soybean meal annually. Much of this is from countries where farmers have the benefit of choice of GM technology. This shows that the grains supply chain has the infrastructure and skills to segregate canola and provide grain customers with what they want.

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<sup>10</sup> Monsanto Australia, planting audits - 2006/07 Technology User Agreements

<sup>11</sup> Single Vision Grains Australia - Delivering market choice with GM canola (July 2007)

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There is no evidence to indicate GM canola will have an adverse effect on Australia's export market, just as Canadian farmers who have grown GM canola since 1996 have successfully marketed their produce.

Canada grows about four times more canola than Australia and the adoption of GM varieties continues to increase. Canola exports, on average, have continued to grow including into Australia's primary canola markets - Japan, China, Pakistan and Bangladesh. This indicates that Australian GM canola would continue to access the same markets our canola industry is currently trading with<sup>12</sup>.

ABARE has stated it is difficult to examine whether the possibility of unintended presence of GM canola in wheat and barley would jeopardise markets for those grains.<sup>12</sup> However using Canada as a case study, no evidence was found of Canada's wheat and barley exports having been adversely affected by unintended presence of GM canola.

There has been no change in major export destinations for wheat following the introduction of GM crops in both the U.S. and Canada, with no evidence that exports have been lost as a result of the adoption of GM soybean, corn and canola varieties.<sup>13</sup>

A report by PG Economics on the coexistence of GM crops states that "evidence to date shows that GM and non GM crops (including organic) have successfully coexisted without causing economic/marketing problems since GM crops were first grown commercially in 1995."<sup>14</sup>

Findings are supportive that conventional, GM and organic farming systems can coexist and produce food that meets the standards of both our domestic and international trade markets. ABARE concluded in a recent report that if commercialised, GM canola would have negligible direct impacts on organic production in Australia.

### **Australian canola pricing**

Australia's domestic canola prices, although on average higher than those of Canada, are reflective of a range of domestic supply and demand conditions in the two markets rather than premiums specific to Australia's present non-GM canola status.<sup>12</sup>

Last season canola growers on the east coast of Australia gained premiums as a result of persistent drought conditions. In other years, a premium has also been paid for Australian canola, however this is not in relation to its non-GM status, rather due to growers sometimes supplying canola, with a higher oil content than Canadian canola.

There is limited evidence of price premiums for organic and certified GM-free canola, while markets for these canola types are still very much niche markets. Traditional import markets for canola – Bangladesh, China, Japan, Mexico and Pakistan – accept GM canola as readily as conventional canola at a similar price.<sup>12</sup>

### **Liability and segregation**

Monsanto's position is that the introduction of GM canola poses no new or hidden liability issues and farmers face no greater risk than they do now when delivering grain to meet specific segregations for specific markets. For example, Australia currently provides segregations for ten different market classes of wheat.

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<sup>12</sup> Foster, M. and French, S. 2007, *Market Acceptance of GM Canola*, ABARE Research Report 07.5

<sup>13</sup> Australian Oilseeds Federation - *Fast Facts* – International Market Q & A for GM Canola; "Market Implications with GM Canola" (August 2003.)

<sup>14</sup> Brookes, G and Barfoot, P. 2004. *Co-existence of GM and non-GM crops: current experience and key principles*

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Farmers or grain industry participants who choose not to grow or handle GM crops should be reassured that issues of economic loss suffered as a consequence of the introduction of GM crops can be dealt with by the principles of Common Law.

A hierarchy of mechanisms exists to define and enforce property rights, beginning with informal norms, such as good neighborliness and a strong recognition of the need for coexistence through collective self regulation. The cotton industry's adoption of GM technology 11 years ago is a successful example of this.

Monsanto finds no evidence to suggest that the commercial introduction of OGTR-approved GM crops will pose problems that are beyond the scope of informal resolution or the use of Common Law to rectify and hence, differing production systems can successfully coexist in Australia. This issue has been well researched and documented in a report by ACIL Tasman.<sup>15</sup>

Existing liability law applies to developers and users of products of modern biotechnology just as it applies to any other company or individual.

In particular, existing law establishes liability in cases of physical or property damage resulting from a company's activity or the use of its products in accordance with labels and directions.

Prior to market approval, biotechnology products undergo extensive safety testing and regulatory review, ensuring that products are at least as safe for human health and the environment as their conventional counterparts.

While liability discussions often convey the idea that some sort of "harm" has occurred or may occur, the reality is that biotech traits are commercially approved to be consumed and specifically to be part of the commodity system. Their mere presence in commodity streams does not, in and of itself, represent any harm. Whether such presence triggers negative or positive market reactions falls in the business risk realm and is not usually considered relevant in the context of liability.

As far as calls for "liability" for the mere presence of a biotech trait in another farmer's product, there is no legal issue related to that presence, but rather only marketing issues. The responsibility for implementing practices to satisfy specific marketing standards or certification must lie with the farmer who is growing a crop to satisfy a particular market, since it is that farmer who is extracting the value from that product.

The concept that "Those who introduce a new technology need to protect others from its impact" is properly addressed through the existing regulatory and legal framework providing for the approval and commercialization of biotechnology.

### **Adventitious Presence (AP) and successful coexistence**

The Australian grains industry is dynamic, with a myriad of segregations of various grains allowing farmers to differentiate products and grow crops or varieties suited to individual farming business needs. Segregation is not feasible without some tolerance of mixing between segregations.

The presence of low levels of unintended ingredients in commodity grains and manufactured goods is a fact of life occurring in virtually any production process and the introduction of GM crops will not aggravate this situation.

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<sup>15</sup> ACIL Tasman (2005) *Managing GM crops in Australia: GM crops segregation and liability in Australia*

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The presence of trace levels of approved GM material in non-GM material is a reality in agricultural production systems around the world where seeds are traded between countries. Therefore, thresholds and tolerances for off types and impurities have always been necessary in seed and grain production and trade.

The concept of zero tolerance in the seed and grains industry is unrealistic and is at odds with international market requirements. International tolerances for labelling of GM content in non-GM grain range from a low of 0.9% in the European Union to a high of 5% in Japan. Furthermore, Australia's major canola export markets accept GM canola. There is clear evidence that GM grain is finding ready markets around the world and Australia's major canola export markets readily accept GM canola.

Co-existence is strictly an economic issue. The health and safety of biotechnology products is not an issue because the food, feed and environmental safety of the products must be demonstrated before the products enter the agricultural production system and supply chain. Co-existence is about the existence of safe and approved production methods in a shared environment, not the exclusion of systems.

The responsibility for implementing practices to satisfy specific marketing standards or certification must lie with that farmer who is growing a crop to satisfy a particular market.

Co-existence of different production systems is a pre-condition of choice.

As the European Commission has stated, "No form of agriculture, be it conventional, organic, or agriculture using GMOs, should be excluded in the European Union... The ability to maintain different agricultural production systems is a prerequisite for providing a high degree of consumer choice."

Organic production has not suffered in North America where there are high rates of biotech adoption. The US organic areas of soybeans and corn have increased by 270% and 187% respectively between 1995 and 2001, a period in which GM crops were introduced and reached 68% and 26% shares of total plantings of soybeans and corn.

Survey evidence among US organic farmers shows that the vast majority have not incurred any direct, additional costs or incurred losses due to GM crops having been grown near their crops.

According to a recent report by PG Economics, evidence from the EU and the U.S. shows that biotech crops grown commercially in these areas have co-existed with conventional and organic crops without economic and commercial problems. The authors also note that in the future the likelihood of economic and commercial problems of co-existence arising remains limited.

<http://www.pgeconomics.co.uk/pdf/Coexistencekeyprinciplesdocument.pdf>

### Impact on environment

OGTR - approved GM canola has been found to be as safe as conventional canola.<sup>16</sup> A 2006 study also found it to be beneficial to the environment with significantly reduced pesticide usage, lowered greenhouse gas emissions and a reduced environmental footprint.<sup>17</sup>

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<sup>16</sup> OGTR DIR 020/2002 - Risk assessment and risk management plan 'general release of Roundup Ready canola in Australia' (December 2003)

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The GM canola varieties approved in Australia have been developed to tolerate post emergent herbicides glyphosate (Roundup Ready®) and glufosinate (InVigor®), which have a lower environmental impact than that of the triazine tolerant or imidiazolinone tolerant canola varieties currently available.<sup>5</sup>

The industry would be more sustainable through better integrated weed management and soil conservation practices if GM canola was a choice available to farmers.

A recent report into global socio-economic and environmental impacts from GM crops found significantly positive environmental and economic benefits.<sup>17</sup> Net economic benefits at the farm level were \$US 5 billion in 2005 reaching \$US 27 billion for the ten year period. There has been a substantial reduction in pesticide applications of 224 million kg (equivalent to about 40 per cent of the annual volume of pesticide active ingredient applied to arable crops in the European Union) resulting in a decrease of more than 15% in the environmental impact associated with pesticide use.

The report also shows a significant reduction in the release of greenhouse gas emissions from agriculture which, in 2005, was equivalent to removing four million cars from the road for one year.

### **Impact on Weed resistance and technology sustainability**

Technology stewardship is a key part of Monsanto's approach to commercialization of GM traits. Growers choosing Roundup Ready canola in Australia will be required to follow a resistance management plan that was developed in consultation with weed scientists across Australia and approved by the Federal Government regulator.

Monsanto is committed to working with growers to address weed resistance to glyphosate. We encourage growers to report suspected cases of resistance to Monsanto so that we can investigate and address potential resistance and implement recommended control measures where resistance is confirmed.

Monsanto continually evaluates its recommendations for weed control efficacy and provides alternate weed control recommendations for any biotype confirmed as resistant.

When glyphosate resistant weed biotypes have been identified, they have been effectively managed with other herbicides and/or cultural practices. Weed resistance to glyphosate is an herbicide management issue, not a crop issue or a biotechnology issue.

Glyphosate resistance first emerged in 1996 in countries where Roundup Ready crops were not commercialized. Glyphosate-resistant weeds have been found in both non-Roundup Ready and Roundup Ready cropping systems.

There are many examples of herbicide resistance where the active ingredient is still used on a wide scale. For instance, there are more than 60 cases of triazine-resistant weeds world wide, but atrazine is still used on more canola hectares in Australia than any other herbicide.

### **Glyphosate safety**

A 2005 study released by a University of Pittsburgh researcher claims that Roundup agricultural herbicides are detrimental to the health of amphibians.

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<sup>17</sup> Brookes G, P Barfoot (2006) GM crops: the first ten years – global socio-economic and environmental impacts, PG Economics Ltd, UK

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The study determined effects of an unspecified Roundup® brand formulation (as well as 2, 4-D, carbaryl, and malathion) on an aquatic community containing algae and 25 species of aquatic animals, including six species of amphibians. The test was conducted in cattle tanks and resulted in nearly complete mortality for tadpoles of several amphibian species.

These studies released by the University of Pittsburgh do not represent the way Roundup branded herbicides are used and applied in the real world. The products used in the studies were designed for residential weed control with application instructions appropriate for that use.

The application rates used in these studies are unrealistically high, and the resulting concentrations in water are not typical of concentrations that would occur in real-world scenarios either from direct applications, indirect applications or run-off. Therefore, they are not directly applicable to the assessment of the safety of our products.

Previous studies under realistic use conditions show that when these products are used according to label instructions and even in situations where inadvertent overspray occurs, they pose no increased risk to aquatic or terrestrial animals.

While there are a number of probable and confirmed factors causing amphibian declines in the USA, including pesticides, Roundup branded products have not been identified as one of them. In fact, one of the leading confirmed causes of amphibian extinctions is infectious diseases.

*For more information see the links below:*

- <http://www.amphibiaweb.org/declines/declines.html#why>
- <http://www.cdc.gov/ncidod/eid/vol5no6/daszak.htm>

Monsanto stands behind the safety of its products, including its Roundup branded herbicides, which have a 30-year history of safe use.

Regulatory agencies around the world, including the APVMA, the U.S. Environmental Protection Agency (EPA) and the European Commission, along with independent researchers, have thoroughly evaluated Roundup branded products and their active ingredient, glyphosate, and approved them for use in more than 130 countries worldwide.

For more information, go to the link below:

- [http://www.monsanto.com/monsanto/layout/sci\\_tech/crop\\_chemicals/scipubs.asp](http://www.monsanto.com/monsanto/layout/sci_tech/crop_chemicals/scipubs.asp)

### **Technology License Agreements and Technology Stewardship**

To use Monsanto technology in seeds growers enter a “Technology User Agreement” or TUA. Agreements of this type have been used in Australia since 1996.

The TUA is a license agreement entered in to in each year that a grower chooses to use Monsanto Technology. The license outlines the terms and conditions associated with the use of GM technology.

The purpose of the TUA is to:

- Ensure compliance with the Federal regulatory requirements, which include:
  - Reporting requirements on GM crop use
  - Resistance management requirements to ensure the sustainability of the technology.

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- Ensure that cooperative industry stewardship practices are followed.
- Protect Monsanto's intellectual property.

GM technology is an important part of Australia's commercial cotton production. The proper stewardship of GM crops is critical to the long term sustainability of the cotton industry and our technology.

We have worked with independent scientists and the regulators to design a stewardship regime for GM cotton based on this principle in an effort to fit the needs of technology providers, growers and industry alike. The licensing of technology is essential to ensuring growers are aware of their obligations and undertake the necessary steps to meet the needs of good stewardship.

Components of this stewardship strategy include training and the development of resistance management (RMP) and crop management plans (CMP) specific to traits. These resistance management strategies are agreed with the intent of preserving the sustainability and long term benefits of the technology.

The cotton industry is integral in this process and via ACGRA ([Australian Cotton Growers Research Association](#)) the industry maintains a [Transgenic and Insecticide Resistance Management Strategy committee](#) (TIMS).

TIMS provide input into the development of scientifically based strategies to manage resistance to pest management technologies. The registration of these technologies by the APVMA ([Australian Pesticides and Veterinary Medicines Authority](#)) stipulates TIMS endorsement of each GM cotton traits RMP's and CMP's.

For over ten years the TIMS committee has supported the development and annual review of the Cotton IRMS (Insecticide Resistance Management Strategy), Bollgard II® Resistance Management Plan (RMP), Roundup Ready® Crop Management Plan (CMP) and is currently contributing to the Roundup Ready FLEX® CMP and the Liberty Link® Cotton and Liberty® 150 Herbicide CMP.

### **Outline of Stewardship requirements for Roundup Ready canola**

#### ***Stewardship - why have it?***

- Ensure growers and agronomists are
  - sufficiently trained and supported
  - to enable the sustainable and lawful use of GM canola technology
  - does not adversely affect other production systems or the environment.

#### ***Stewardship – What's involved?***

- Technology User Agreement (TUA)
  - Clear outline of regulatory and intellectual property obligations
- Accreditation Program
  - Formal training session
- Crop Management Plan
  - Includes a Resistance Management Plan

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- Help growers get maximum value and stay compliant with all regulations
- Feedback
  - To Monsanto, Industry, Regulators and Government

### ***What's in the Crop Management Plan?***

- In crop management
  - Agronomic aspects to get the most from the crop
  - Regulatory requirements (OGTR & APVMA)
  - Weed control strategies
  - Pollen flow / buffer zones
- Post crop management
  - Volunteer management
  - Seed and grain handling
- Resistance Management Plan

### ***What's in the Resistance Management Plan?***

- Part of the Crop Management Plan
- Aims to ensure sustainable use of Roundup & Roundup Ready canola technology.
- Flexible system that allows growers choice
- Paddock by paddock assessment
- Identifies risk trends for herbicide resistance and suggests actions to diminish risk
- Key Australian scientists, researchers, agronomists and growers involved in development of the resistance management plan.

### **Intellectual Property**

Intellectual property rights are important to protect private and public investment in new technologies. Intellectual property protection benefits farmers by allowing companies to continue development of biotech crops that increase production efficiency, lower input costs, and provide environmentally sustainable options.

Respect for intellectual property is important to all involved in agriculture, from technology developers, farmers and breeders to distributors and seed growers. Intellectual property protection encourages innovations that will lead to the next generation of value-added products for growers and consumers.

Whether held in the private or public sector, patent holders disclose their inventions to the public in return for the limited protection (usually no more than 20 years) such patents provide. These disclosures, by sharing knowledge, lead to further research and thus benefit both the IP holders and any others interested in the field.

### **The Schmeiser Case in Canada & enforcement of Intellectual Property rights.**

It has never been, nor will it be Monsanto policy to exercise its patent rights where trace amounts of our patented traits are present in farmer's fields as a result of inadvertent means.

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We only file saved seed lawsuits in situations where we can prove the farmer knew he possessed Monsanto's patented technology and knowingly used the technology without a license. To date, the farmers we have sued had crops that were, at least, 90% populated with Monsanto's patented traits.

After more than 10 years of commercially selling GM traits in the Australian cotton industry we have never filed a saved seed law suit in Australia.

Trait fee collection allows agricultural biotechnology companies to continue investing in research and development. The overwhelming majority of farmers understand the value that biotech crops bring and are supportive of efforts to bring new and innovative products to the market. The majority of growers want a level playing field and have made it very clear to Monsanto that others should not be allowed to get away with seed piracy.

Monsanto maintains the integrity of the seed licensing process in fairness to the great majority of growers who are licensed users of our technology and who are abiding by grower licensing agreements.

The vast majority of patent infringement cases are settled without resort to litigation, and many of these growers remain our customers.

Our approach to enforcement of intellectual property and regulatory compliance is where possible to follow a "Braithwaite Pyramid" type non-compliance process where the great majority of questions and potential issues are managed through co-operation. If greater action is required we may seek to use incentives such as compliance levies or rebates moving in rarer cases to directional tools such as warning letters. In very unusual cases we may then move to sanctions, such as withholding technology, followed if necessary by the most serious actions of referring cases to regulators or initiating legal proceedings.

Monsanto always tries to come to a resolution as quickly and inexpensively as possible for both parties. Monsanto makes every attempt to handle disputes out of court. However, in a small number of cases, litigation is required, although not to date in Australia.

Monsanto does not financially benefit from settlements. All pre-trial settlement dollars collected overseas are directed toward education initiatives such as scholarships and leadership training. After more than a decade of commercial use of Monsanto technology in Australian cotton, no such settlements have been required in Australia.

The Schmeiser case in Canada was not about accidental or innocent infringement of a patented technology. The Trial Court found that the sheer quantity and commercial quality of Roundup Ready canola found in Mr. Schmeiser's crops in 1998 could not be reasonably explained by any of the possible sources suggested by Mr. Schmeiser.

Mr. Schmeiser knowingly and deliberately planted, harvested and sold Roundup Ready canola without paying the required license fee, an assertion supported by the findings of the Federal Court of Canada, Federal Court of Appeal in Canada and the Supreme Court of Canada.

All of these courts ruled that the subject matter claimed within the patent for Roundup Ready canola falls within the Patent Act and that Mr. Percy Schmeiser and Schmeiser Enterprises Ltd. of Bruno, Saskatchewan infringed that patent.

See <http://www.ijcan.org/ca/cas/scc/2004/2004scc34.html>

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**So called “Terminator” technology**

Monsanto has made a commitment not to commercialize sterile-seed technology in food crops. We have no research or plans underway that in any way go against that commitment.

Out of concern for the welfare of poor, smallholder farmers, Monsanto made the commitment in 1999 that we wouldn't commercialize sterile-seed technology in food crops. We reaffirm our absolute commitment not to use “Terminator” (renders next generation seed sterile) technology that would prevent small growers in the developing world from maintaining their traditional practices, subsistence or livelihood

**Impact on biotech industry**

The freedom to operate created by removal of the moratoria will attract and generate reinvestment in research activities, expanding the opportunities for growth and development in the agricultural biotech sector.

Monsanto, like other technology providers, would gain confidence in Australia as a good place to invest. We would be encouraged to recommence more extensive research and development activities in Australia.

**4. On the basis of the above assessments, make recommendations to Government on the most appropriate option to adopt; and**

Monsanto recommends the Government allow the moratorium to expire. As noted in TOR 1. the grains industry has the ability to manage the introduction of GM canola and the capacity to deliver choice throughout the supply chain as dictated by the market.

The Primary Industries Ministerial Council (PIMC) determined on 7 May 2002 that risks to agricultural production and trade should be self-regulated by industry, supplemented by government monitoring.

The grains industry has assessed the market requirements for GM canola and the mechanisms are already in place to ensure market choice. Adventitious presence (AP) thresholds for unintended presence are already established for Australia and importing countries for labelling purposes.

Key grains industry bodies have recently endorsed the findings in a report by SVGA which urges governments to recognize the grains industry's ability to handle, and commitment to support, the commercialisation of approved GM canola in Australia.<sup>11</sup>

Australia's cotton industry provides an excellent model of the success of GM technology and the capacity of industry to self regulate and maintain appropriate stewardship measures to ensure the long term sustainability of new technology.

**5. In the event that the panel recommends extension of the legislation recommend appropriate amendments to the legislation**

Monsanto's position is that the legislation is not required as demonstrated by the commitment of grains industry participants to support the commercial introduction of GM canola. The Australian grains industry has protocols and processes in place to meet the management requirements for canola if GM canola is commercialised.

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An extension of the legislation will serve to further the uncertainty surrounding the status of GM technology in Australian agriculture, delay the development of better understanding of the technology and of broader farmer experience with it.

The Gene Technology (GM Crop Moratorium) Act 2003 is a prohibitive form of legislation. It represents a regulatory step without the necessary structure to ensure a properly resourced regulatory system is in operation. For example, an effective regulatory system should include a defined legislative process to submit data, specification of what that data should be comprised of, and the data should be independently and expertly evaluated. Following that, the submission may be accepted or rejected within defined timeframes. Furthermore, regulatory bodies have clearly defined terms of reference and due process. Much of these elements are not present in the State legislation.

It is Monsanto's position that legislation allowing governments to create moratoria on GM crops, at the point in their development whereby they have been approved as safe for human health and the environment by the Federal regulator, is a significant disincentive to investment in Australia.

### **Concluding statement**

The moratorium on GM canola is no longer required. This prohibition Act has generated a great deal of uncertainty, discouraged investment and caused significant economic loss by not allowing farmers to capitalise on the productivity benefits of GM canola, while also delaying investment in future GM technologies.

Global adoption of crops enhanced with GM traits continues to increase and GM grain is finding ready markets around the world. Australia stands to gain from its use here.

The evidence as detailed above indicates GM canola does not have an adverse impact on markets or trade.

The grains industry has signalled its readiness to move forward with the commercialisation of approved GM canola varieties. The industry has the capacity to manage the introduction of GM canola and industry and farmer groups are calling for access to GM technology to remain competitive and sustainable.

Farmers should no longer be denied the choice to access new GM technologies.

## **Appendix**

### **The Benefits of Roundup Ready® canola for Western Australian Farming Systems**

Adam Ralph and Daniel Kruithoff, Monsanto Australia Limited

Published in Agribusiness Crop Updates 2004 (Crop Updates is a partnership between the Department of Agriculture, Western Australia and the Grains Research and Development Corporation).

#### **Key Messages**

Local trials demonstrate that Roundup Ready canola® offers substantial productivity benefits to Western Australian farmers.

Productivity gains and increased farmer profitability are derived primarily from the excellent weed control and higher yields of Roundup Ready canola.

Half of the 2003 Canadian canola crop is Roundup Ready canola, underlining the significant advantages Canadian growers are experiencing with this new technology.

#### **ABSTRACT**

WA farmers would reap significant agronomic and economic benefits through the adoption of Roundup Ready® canola. Trials results in Western Australia consistently demonstrate that Roundup Ready canola offers excellent weed control and higher yields than Triazine Tolerant (TT) canola.

TT canola has been widely adopted in WA for its weed control benefits (approximately 90% of the 2003 WA crop). This adoption is despite the significant fitness penalty inherently associated with TT canola. This fitness penalty manifests as decreased seedling vigour, yield and oil content: which is a significant limitation to WA canola productivity. Roundup Ready canola offers farmers a more productive herbicide tolerant cropping option.

The ability to apply Roundup over-the-top of Roundup Ready canola provides excellent levels of broad-spectrum weed control. Furthermore, there is no fitness penalty associated with Roundup Ready canola. This translates into significantly higher yields than TT canola. It has been established through trial work in WA that Roundup Ready canola would provide significant agronomic and economic benefits to WA farmers.

#### **INTRODUCTION**

Monsanto has developed genetically enhanced canola plants that are tolerant to applications of Roundup Ready® Herbicide. This new technology, known as Roundup Ready canola, offers growers an exciting, alternative weed control option in canola.

Roundup Ready canola technology was first trialed in Australia in 1997, and has been commercialised in Canada since 1996. The adoption of Roundup Ready canola technology has been rapid and widespread in Canada, underlining the benefits that Canadian growers are experiencing. In the 2003 growing season, Roundup Ready canola accounted for 49% of the total Canadian canola crop (source: RR DataMart Independent Market Research).

The ability to use Roundup Ready Herbicide over-the-top of Roundup Ready canola can enhance the sustainability of canola growing and reduce the selection pressure on weeds from current in-crop herbicides and weed management programs. Use of Roundup Ready Herbicide in Roundup Ready canola allows more flexible weed management programs, with better weed control and higher yields.

Western Australian farmers have great potential to benefit from the increased yields offered by Roundup Ready canola. The widescale adoption of TT canola has been necessary due to the weeds present in WA cropping systems, however, this dominance of TT canola in WA can be considered a

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limitation to the state's canola production. Due to its mode of tolerance, TT canola suffers a fitness penalty relative to conventional canola. This manifests as reduced vigour, yield and oil contents. Roundup Ready canola has no such fitness penalty, and therefore has the potential for increased vigour, yield and oil content relative to TT canola. The ability to provide excellent levels of weed control and increase yields offers substantial benefits to WA farmers.

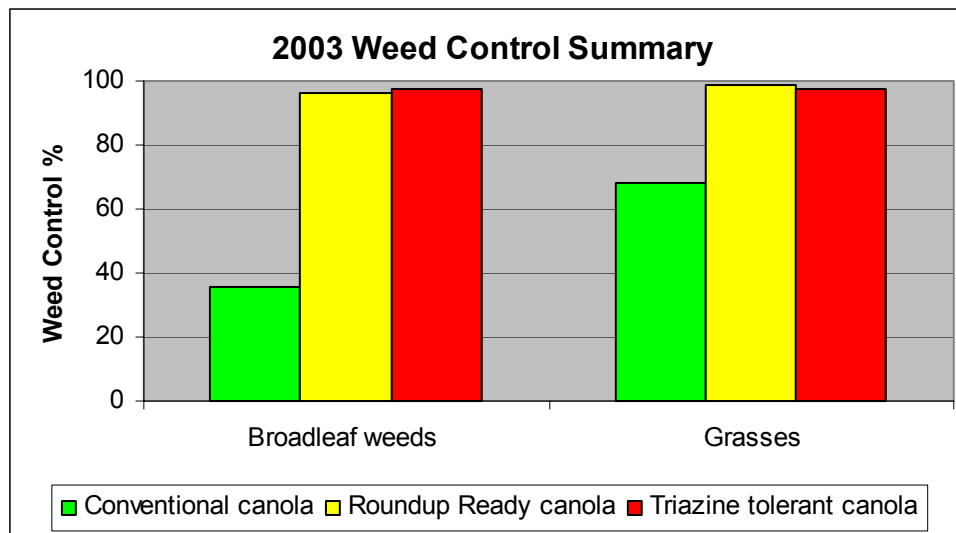
### Results

#### **Improved Weed Control**

The Roundup Ready canola weed control system provides excellent control of a range of grass and broadleaf weeds. The system is easy, flexible and broad-spectrum. In addition to the flexible weed control system, growers have the ability to utilise an herbicide with which they are already very familiar and comfortable with the human health and environmental safety profile.

Roundup Ready canola offers better control of grasses and broadleaf weeds than both conventional canola and IMI tolerant canola. In many areas of WA (and Australia generally) conventional canola is not a viable option due to the inability to control most broadleaf weeds. For example, the inability to control brassica weeds in conventional canola can decrease yield and lower the grain sample quality. In contrast, Roundup Ready canola is able to control a wide range of weeds that can flourish under a conventional system.

The primary reason for the adoption of TT canola throughout Australia is the ability to control a wide range of broadleaf weeds. Similarly, Roundup Ready canola weed control systems provide high levels of broadleaf weed control. The advantage of Roundup Ready canola over TT canola can often be seen in grass control. Whilst TT systems can provide good control of many grasses, this control can often be variable (depending on soil moisture) and require assistance from grass selective herbicides. The Roundup Ready weed control system is less reliant upon soil moisture, and therefore offers more consistent high levels of grass control. This was clearly demonstrated throughout the 2000 and 2001 trial programs ([www.monsanto.com.au](http://www.monsanto.com.au)).



*Figure 1. A summary of the weed control results from a wide range of grass and broadleaf weeds present in six trials throughout Australia in 2003 (one in WA, one in SA, one in NSW, and three in Vic).*

#### **Increased crop productivity**

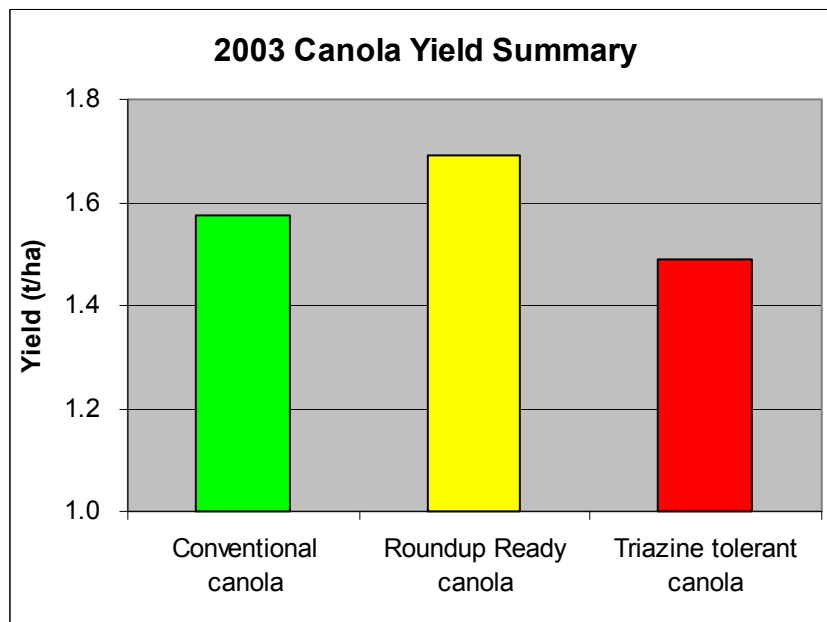
The effectiveness of Roundup Ready canola as a weed control system enables farmers to benefit from increased crop productivity. Farming systems trials throughout Australia have consistently demonstrated increased gross margins with Roundup Ready canola relative to other canola technologies. This increased gross margin is generated from lower input costs and increased yields.

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Roundup Ready canola has consistently out-yielded TT canola in Australian farming systems trials. The inherent fitness penalty of TT canola decreases its yield potential. TT canola has lower seedling vigour, less ability to compete with weeds, lower yields and lower oil content. As Roundup Ready canola has no such penalties, it has greater seedling vigour, more ability to compete with weeds, higher yields and higher oil contents than TT canola.

Yield comparisons with conventional canola also demonstrate the advantages of excellent weed control with the Roundup Ready canola system. The incremental yield from Roundup Ready canola increases as weed pressure increases, or if the type of weeds present can not be controlled within conventional canola.

The yield advantages stemming from better weed control can spill over into the following phases of the rotation. Continuation of the Farming Systems trial work has shown the potential for increased wheat yields following Roundup Ready canola. This is largely due to superior grass weed control in the canola phase resulting in less competition for the wheat crop. Additionally, with respect to triazine tolerant canola, in a dry season with little or no spring and/or summer rainfall, triazine carryover can be common. Triazine residues at the time of sowing wheat can decrease germination, cause poor vigour and potentially decrease final wheat yield.



*Figure 2. A summary of the yield results from six trials throughout Australia in 2003 (one in WA, one in SA, one in NSW, and three in Vic).*

### **Stewardship Strategy**

In order to responsibly introduce and steward Roundup Ready canola, growers are required to implement on-farm management practices that aim to prevent the evolution of herbicide resistant weeds, control Roundup Ready canola volunteers, minimise risks to the integrity of grain supply-chains, and ensure good crop agronomy in a sustainable manner. As part of a stewardship strategy, growers seeking to use Roundup Ready canola are required to take part in the Roundup Ready canola Accreditation program. The aim of the program is to ensure that growers and agronomists are sufficiently trained and supported (with appropriate information and tools) to enable the sustainable use of Roundup Ready canola technology in a manner that increases productivity and does not adversely affect other production systems or the environment.

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The stewardship package for Roundup Ready canola incorporates a glyphosate resistance assessment model that has been developed by Monsanto in consultation with leading Australian researchers. This model was specifically developed for Australian farmers and has recently gained regulatory (APVMA) approval. It is the first time an “in-paddock” herbicide resistance assessment model has been developed for glyphosate and it reinforces the need for growers to adopt appropriate weed management practices for the sustainable use of glyphosate.

### **Conclusion**

Roundup Ready canola has the potential to offer significant agronomic and economic benefits to Western Australian growers. Trial results in Western Australia consistently demonstrate that Roundup Ready canola offers excellent weed control and higher yields than Triazine Tolerant (TT) canola. The adoption of Roundup Ready canola technology has been rapid and widespread in Canada, underlining the benefits that Canadian growers are experiencing. In Western Australia, due to the current dominance of TT canola, the adoption of Roundup Ready canola could significantly increase productivity and sustainability.

### **Key words**

Roundup Ready canola, increased yield, excellent weed control,

### **Acknowledgments**

David Hudson, Kevin Eke, Bethwyn Todd, Helen Arthur, David Penna.