

**SUBMISSION TO THE NEW SOUTH WALES
GM CROPS REVIEW PANEL
FOR THE INDEPENDENT REVIEW OF THE
GENE TECHNOLOGY (GM CROP MORATORIUM)
ACT 2003**

Submitted by: Bayer CropScience Pty Ltd

Dated: 31 August 2007

New South Wales

Independent Review of the Gene Technology (GM Crop Moratorium) Act 2003

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Executive Summary

The current moratoria imposed by the States is of great concern as it intrudes upon the Genetically Modified (GM) crop development process that has gone on before and demonstrates to industry and investors that there is no clear path to commercialisation for GM crops, with the notable exception of GM cotton. This situation is a clear disincentive for any future investment in the agricultural biotechnology industry and must necessarily put at risk any potential future benefits: agronomic, social, environmental and economic.

GM canola has been grown commercially in Canada for the past 11 years and has been of significant benefit for the Canadian oilseed industry. In contrast, there does not appear to be any demonstrable advantage for Australia not to commercialise GM canola. For a range of reasons, Australian canola growers need access to new types of Herbicide Tolerant (HT) canola apart from current varieties.

The lack of a clear path forward and the lack of legislative uniformity nation-wide create significant disincentives for investment into agricultural biotechnology. Both international investments and domestic public research are threatened by this lack of clarity.

A number of independent studies have been conducted on the impact of the introduction of GM canola on Australia's ability to continue to access its overseas markets. These studies have all, unequivocally and without exception, concluded that Australia's access to export markets is at low risk if GM canola were grown commercially in Australia, i.e., markets would either not be affected or be only minimally affected. On the other hand, studies have also suggested that Australia's competitive and sustainable position will be compromised if GM crops are not introduced as new tools and options for farmers.

Through its Single Vision Grains Australia (SVGA) initiative, the grains industry engaged the supply chain members to determine if and how GM crops should be introduced into the Australian agricultural environment. The process identified that government regulations in the area of market effects is not warranted and that the grains industry itself is able to manage market effects of GM crops.

The SVGA initiative found that the grains industry has the expertise and capability to implement the processes required to facilitate the introduction of GM crops to any specified practical standard. In other words, the industry is capable of offering choice to farmers of whether they wish to grow GM or non-GM crops.

All State Farmer Federations (in addition to the National Farmers Federation) are now calling for the immediate lifting of the moratoriums so farmers can have access to GM canola.

Liability: Liability arising from GM issues is no different from liability arising from other activities and current liability laws are designed to cater for such eventualities. Implementation of strict liability is completely inappropriate. Such laws should only be

used when dealing with extremely dangerous activities rather than GM crops that have been approved for safety to humans and the environment.

Premiums: There have been claims that non-GM canola has attracted premiums and that allowing a GM canola choice would see the premiums eroded. This claim cannot be substantiated. A 2007 study by ABARE shows that there are no sustained premiums for non-GM canola. While there are niche markets for certified non-GM canola which offer a premium, these markets are extremely limited.

A recent study by Foster and French (2007) concluded that there was no evidence of unintended traces of GM canola causing market acceptance problems for Canadian wheat and barley exports.

Dairy: The Australian Dairy industry, in June 2007, endorsed a pro-choice GM position allowing the growers and market to decide if they want to use GM, acknowledging feed supplies already include Australian GM cotton and imported GM ingredients to meet stockfeed specifications and market requirements. GM canola may be used as hay and meal for stockfeed.

Conclusion

When the practical effect of the Act has been to stop GM canola, for which there is no credible market evidence to prevent its cultivation, it is highly questionable if the Act has served any beneficial purpose to date. We believe without reservation that the order prohibiting cultivation of OGTR approved canola must be allowed to expire.

Independent Review of the Gene Technology (GM Crop Moratorium) Act 2003

The following submission has been prepared in response to the NSW Government's request for information and input into the review of the above Act. This submission attempts to address the stated areas of interest in a manner which is succinct yet includes the most relevant and complete information.

Should any further information or clarification be required please be encouraged to contact directly the person listed above.

Introducing Bayer CropScience

Bayer CropScience, a subsidiary of Bayer AG with annual sales of about EUR 6.0 billion, is one of the world's leading innovative crop science companies in the areas of crop protection, non-agricultural pest control, seeds and plant biotechnology. In Australia, the company employs 270 people and has its head office in Melbourne. It has agricultural chemical production plants in 3 States (Queensland, New South Wales and Western Australia).

The BioScience division within Bayer CropScience is focused on providing sustainable, high value plant-based solutions for agriculture.

The Australian BioScience division of Bayer CropScience has been involved in the development of Genetically Modified (GM) canola and cotton in line with its global focus on these crops and its commitment to delivering innovative solutions for agriculture. The company has conducted trials with GM canola in Australia since 1996. In 1998, the company formed an alliance with the CSIRO to support fundamental plant science research that leads to innovative and valuable discoveries predominantly in cotton. The CSIRO / Bayer CropScience alliance has already seen some significant scientific advances including innovations in the control of insect pests, cotton fibre development and the mechanisms that control seed development. In 2006/07, Bayer CropScience launched its first Australian GM cotton product, complementing the comprehensive range of crop protection technology that the company has provided to the cotton industry for many years. Research and innovation is on-going into better cotton and canola varieties that suit the requirements of Australian farmers and meet global market demands.

Bayer CropScience GM crop trials in NSW

In July 2003, the Office of the Gene Technology Regulator (OGTR) determined that Bayer CropScience's InVigor[®] hybrid canola (tolerant to glufosinate-ammonium) to be as safe to human health and the environment as conventional canola and approved its general release into the Australian environment. Following this all States, except Queensland, introduced moratorium legislation to stop the cultivation of the GM canola on the basis of impact on trade.

Bayer CropScience has conducted trials with GM canola in NSW since 1996. However, since the imposition of the moratorium legislation in 2003 no further trials have been carried out in NSW.

Bayer CropScience have continued with a small scale, strictly regulated program of research and innovation trials involving new GM canola research material under licences from the OGTR, as well as with InVigor hybrid canola, under exemption permits in South Australia and Victoria. Details of these activities have been published by the respective regulators on their web sites (refer www.pir_sa.gov.sa, www.dpi.vic.gov.au and www.ogtr.gov.au).

Path towards adoption of GM crops

In preparation for the introduction of GM crops, the Federal Department of Agriculture, Fisheries and Forestry (DAFF) had, in fact, been considering this eventuality and funding had been provided to assess and prepare for the introduction of GM canola since 2001.

DAFF had, as part of their review, identified the three main areas of risk from GM crops: Risk to the environment, Risk to human health and Risk to markets.

The first two have been comprehensively and unequivocally dealt with by the OGTR who determined (in 2003) that Bayer CropScience's InVigor hybrid canola is just as safe as conventional canola. Food Standards Australia New Zealand (FSANZ) have also assessed the food and feed safety of InVigor hybrid canola and consider the oil to be safe for human consumption. Since canola oil contains no GM protein and is considered substantially the same as its conventionally derived counterpart, it does not require labelling in accordance with the FSANZ regulatory requirements.

In considering market risk DAFF commissioned a number of independent studies in which market access risks were assessed. The studies published during the lead up to approvals being granted in 2003 and further studies published since then, show unequivocally that there would be negligible impact on Australia's market access position¹.

More recently DAFF has released two comprehensive reports reviewing the status of GM crops and GM canola in particular. These papers examine in detail, issues regarding the impact of the moratoriums and the way forward:

1. GM Canola: An Information Package. ACIL Tasman July 2007²
2. A National Market Access Framework for GM Canola and Future GM Crops. SGA Solutions Pty Ltd August 2007³.

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.

¹

- a. Market Acceptance of GM Canola
ABARE Research Report 07.5
Max Foster and Simon French, March 2007
- b. ACIL Tasman (2003). Genetically modified canola. Market Issues, industry preparedness and capacity for segregation in Victoria. Prepared for the Victorian Government's Interdepartmental Canola Steering Committee.
- c. Market Access Issues for GM products. Implications for Australia.
Max Foster, Peter Berry and John Hogan
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- f. Australian Oilseeds Federation Fast Facts No. 5- Market Implications with GM Canola

² GM Canola: An Information Package. ACIL Tasman July 2007-08-27

³ A National Market Access Framework for GM Canola and Future GM Crops. SGA Solutions Pty Ltd August 2007

The Plant Industries Committee (PIC), acting under this mandate, subsequently developed protocols for industry that were adopted by the grains industry's Gene Technology Grains Committee (GTGC) in their stewardship guidelines for industry to implement a policy of co-existence of agricultural production systems, including GM, conventional and organic crops. The GTGC, consisting of all the major industry stakeholders (e.g. grain marketers, bulk handlers, grain growers, technology providers) and federal and state government representatives had publicised guidelines for the introduction of GM grains into the Australian agricultural environment. These guidelines follow closely the recommendations of the Plant Industries Committee's (PIC) *Guidelines for Industry Stewardship Programs and Crop Management Plans for the Management of Genetically Modified Crops in Australian Farming Systems*. The primary technology proponents, Bayer CropScience Pty. Ltd. and Monsanto Aust. Ltd. had been active participants within the GTGC process and had undertaken extensive communication and planning for the introduction of the first GM canola crops with key individual supply chain participants, i.e. grain handlers, grain marketers, farmer representative organisations.

In attempting to develop Bayer CropScience's InVigor hybrid canola and make it available to the Australian farmer, a systematic process, including a cautious well managed introduction, was proposed. GM canola commercial introduction was formalised through development of Crop Management Plans (CMP) specific to the GM canola type (i.e. InVigor and Roundup Ready[®] (tolerant to glyphosate)). These crop management plans were developed in consultation with industry stakeholders and contained practical management instructions and training requirements in line with the PIC stewardship protocols available at the time.

In December 2003, the Victorian government contracted Prof Peter Lloyd to report on the advisability of allowing commercialisation of GM canola. The report⁴ found no market risk for NSW's trade position and recommended that limited plantings be allowed. The recommendations were ignored and moratorium legislations introduced in NSW and all other States except Queensland.

The current moratorium imposed by the States is of great concern as it intrudes upon the GM crop development process that has gone on before and demonstrates to industry and investors, that there is no clear path to commercialisation for GM crops – aside from GM cotton which has successfully been commercially grown in Australia for the past 10 years and ironically contributes Australia's 2nd highest source of food oils derived from the cotton seed. This situation is a clear disincentive for any future investment in the agricultural biotechnology industry and must necessarily put at risk any potential future benefits: agronomic, social, environmental and economic.

⁴ Report of the Independent Reviewer to the Government of Victoria. Review of market impacts of genetically modified canola and industry preparedness. Prepared by Professor Peter J Lloyd. December 2003.

Operations of the Act

The Control of GM Crops Act in its present form is merely a prohibitive legislation, having none of the safeguards found in, for example, the Federal Gene Technology Act. It represents a regulatory step without the necessary regulatory structure to ensure a properly resourced regulatory system is in operation. For example, an effective regulatory system should have a defined legislative process to submit data, specification of what that data should be comprised of and for that data to be independently and expertly evaluated. Following that, the submission may be approved or rejected with defined submission and assessment timeframes. Furthermore, regulatory agencies have clearly defined terms of reference and there are avenues of appeal (apart from an appeal to the Supreme Court). Much of these elements are not present in the existing State moratorium legislation.

The moratorium legislation of each Australian State is different from each other. There is a lack of uniformity and duplication between States. This is a waste of resources at State level and for industry. In years past governments have tried implementation of microeconomic reform. The centralisation and harmonisation of State legislation was identified as crucial to the success of microeconomic reform, which has been regarded as bringing success to the Australian economy.

GM canolas which have been approved by the OGTR for commercialisation are allowed by the OGTR to be cultivated without any restrictions or contained conditions. However, trials with OGTR commercially approved events currently carried out under State legislations are only allowed on restricted hectareage and have strict controls and containment conditions applied to them. These conditions are different in each State.

The legislation operates mainly as a prohibition legislation that can be imposed at any time even after approval is granted by the OGTR for commercialisation. Thus there is no clear and predictable path to market. The moratorium legislation does not provide any of the safeguards required of good legislation, such as transparency, independence, national uniformity, right of appeal (apart from an appeal to the Supreme Court), predictability and efficiency.

Furthermore, the moratorium Act has patently prevented the achievement of the aims of the Intergovernmental Agreement (IGA) recitals signed with the Commonwealth, in particular the following sections of the recital: recitals B (a), (b), (c) and (h):

B. The scheme should:

- a) provide an efficient and effective regulatory system for the application of gene technologies;
- b) operate in a seamless manner in conjunction with existing Commonwealth and State regulatory schemes relevant to genetically modified organisms and products derived from such organisms (for example the schemes that regulate food, Therapeutic goods, agricultural and veterinary chemicals and industrial chemicals);
- c) be nationally consistent, drawing on power conferred by Commonwealth, State and Territory Parliaments; and

h) be consistent with Australia's relevant international treaty obligations.

The Federal Government recommended during its review of the Commonwealth's Gene Technology Act 2000 *"that all jurisdictions should reaffirm their commitment to a nationally consistent scheme, including a nationally consistent approach to market considerations."* We believe the recommendation should be recognised and adopted as soon as possible.

The experience of GM canola in Canada

GM canola has been grown commercially in Canada for the past 11 years. During that time GM herbicide tolerant (HT) canola has come to comprise about 85% of all canola grown in Canada. Non-GM herbicide tolerant canola makes up about another 10%. It is evident that HT traits in canola are an important, if not essential, agronomic tool in the growing of canola. Five year average Canadian canola yields increased by 15.8% in the ten years following the introduction of GM varieties in 1995/96. By comparison the five year average Australian canola yields declined by 13.9%^{1f}.

The amount of canola produced in Canada has increased substantially since the introduction of GM canola into Canada in 1996 and continues to do so year to year. For example, in 2002-03 Canada produced about 4 million tonnes of canola seed increasing to 9 million tonnes in 2006-07⁵. In comparison, Australian production rose from about 0.8 million tonnes in 2002-03 to a maximum of 1.7 million tonnes in 2003-04 and has declined from year to year since then to 0.5 million tonnes in 2006-07 (under severe drought conditions).

Canola exports have also increased following the increased production in Canada as shown in the table below.

Table 1. Canadian production and exports

| Canadian production and exports ('000 metric tonnes) | | | | | |
|---|----------------|----------------|----------------|----------------|----------------|
| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 |
| Canola Seed Production | 4178 | 6771 | 7728 | 9660 | 9100 |
| Canola Seed Exports | 2421 | 3763 | 3493 | 5411 | 5750 |
| Canola oil Exports | 529 | 982 | 971 | 1093 | 1200 |
| Canola protein meal Exports | 823 | 1572 | 1414 | 1488 | 1597 |

Source: Foreign Agricultural Service of the US Department of Agriculture.

⁵ Data from the Foreign Agricultural Service of the US Department of Agriculture.

These production and export statistics provide firm evidence that growing GM canola has not negatively impacted Canadian production and there have been no adverse impacts on their markets. Secondly, there has been continued investment into innovative technologies. For example private sector investment in Canadian plant breeding research and development almost tripled in the period from 1987 (\$33.2 million CAD) to 2001 (\$92.5 million CAD)⁶. The Canadian canola industry predicts further strategic growth to 2015 and has ambitious plans to take the Canadian canola industry to 15 million tonnes from currently around 8 million tonnes, focussing on high oil yields and low levels of saturated fats.⁷

There does not appear to be any demonstrable advantage in the last few years when Australia's GM Moratoriums were in place. A telling report issued by the Canadian oilseed industry⁷ concluded that "*Australia has been plagued by production problems in recent years due to drought. Additionally, the continuing moratorium on GM canola is believed to be damaging Australia's long-term production competitiveness. However, it can be expected that Australia will attempt to respond to demand signals and will eventually approve production of GM varieties. With higher production levels, Australia would impact Canadian exports to Japan, Pakistan and the EU.*"

It is evident that GM HT canola is the canola crop of choice in Canada, overwhelmingly chosen by Canadian canola growers. The Canola Council of Canada surveyed farmers to find out why they grew GM canola⁸. The main reasons farmers said they chose to grow canola was the following in order of importance:

- easier & better weed control in general (50% of farmers)
- better yield, better return, more profit (19%)
- for grassy weed control specifically (18%)
- for broadleaf weed control specifically (15%)
- reduce costs (10%)
- trial basis to compare to conventional varieties (9%)
- to clean up fields (7%)

The survey results show that increase in yield is not necessarily the main reason for growing GM canola varieties. Agronomic and convenience reasons are of even greater consideration. Nevertheless, Canadian farmers reported increased profitability of C\$14.333 per ha with GM canola, primarily as a result of higher yields⁹.

Sustainable alternatives for Australian canola varieties

The importance of easy and efficient weed control in canola is shown by the widespread use of triazine tolerant (TT) canola in Australia, in spite of the yield penalty of 5-15% from TT varieties. TT canola is the most widely grown canola in Australia with an average 70%

⁶ Canadian Seed Trade Association: http://cdnseed.org/about_us/fast_facts.asp

⁷ Canola Council of Canada, Growing Great 2015, March 2007.

⁸ Canola Council of Canada, Impact of Transgenic Canola on growers' industry and environment, 2002.

⁹ Genomic Age Series, Part 4: GM canola – benefits risks & challenges. P. Carr, C Preston & M. Foster. May 2007

adoption rate Australia wide but up to 90% in WA. TT canola is long gone from the Canadian market place to be replaced by other novel herbicide tolerant and GM varieties that ensure their sustainable competitiveness, especially higher yields.

A University of Melbourne study by Dr Rob Norton, concluded conservatively that an extra 160,000 hectares of canola could be grown in Australia following the introduction of GM canola¹⁰. Under the scenario investigated this could lead to a reduction in use of 640 tonnes of triazine herbicide, an average increase in yield of from 1.27 t/ha to 1.38 t/ha with an increase in canola production of about 295,000 tonnes annually; an increase of wheat production of 64,000 tonnes on the additional canola area (wheat following canola has a 20% yield benefit over wheat following wheat). The increase in canola and wheat production would be worth \$135 million annually to the Australian grains industry.

For a range of reasons, Australian canola growers need access to new types of HT canola apart from TT and IMI (imidazolinone) tolerant varieties. Arguably glufosinate-ammonium tolerant and glyphosate tolerant varieties overcome many of the shortcomings of the former canola types. For example, yield performances are superior to TT varieties and there is no concern with residual soil effects as with IMI tolerant varieties. In addition, the availability of these newer HT varieties will help with weed resistance management by allowing growers to more effectively rotate their chemical use and avoid heavy reliance on mainly TT canola or Group B herbicides associated with IMI canola.

The point sometimes made by opponents of GM adoption that GM varieties are unproven in their performance is spurious. Farmers will not adopt inferior varieties and the market very quickly sorts out good technology from bad. Thus it is not in the interest of marketing companies to release ineffective varieties for all the common reasons of good business practice. Farmers will always have the freedom to choose the type of variety they want to grow.

A full-scale canola-breeding program would normally involve multiple location trials over several seasons to demonstrate variety geographical fit and features in comparison with competing varieties. All new varieties normally will be put to trial through the National Variety Trials (NVT) program. An NVT system is operated by the Grains Research and Development Corporation (GRDC) to enable independent canola variety assessment and generation of data to allow farmers to make informed variety selections that suit their local conditions and ensure a competitive national canola seed market. The containment and compliance conditions required by the State GM moratorium have imposed practical difficulties for GM varieties to be included in these trials. The moratorium legislations and the restricted conditions make it costly and impractical to conduct NVT trials with GM varieties. The ability to demonstrate the worth of GM varieties has thus been denied with consequential loss for farmers and the oilseed industry.

Under the moratorium conditions in South Australia and Victoria, Bayer CropScience has continued to provide limited opportunities for guided visits for farmers, the supply chain

¹⁰ Conservation Farming Systems and Canola. Dr Rob Norton, University of Melbourne, Avcare, March 2003

participants and local, state and federal Government officers to our trial program and to share the limited information about the variety development and breeding work being undertaken. The results of trials have been communicated to industry and have been published.¹¹

State moratorium legislation has denied growers choice and the right to access safe and better varieties of crops, in particular GM canola. Faced with the effects of climate change, Australian growers are being denied access to the best varieties and consequently being left behind in the global markets.

AOF strategic plan

The Australian Oilseed Federation (AOF) strategic plan to 2010¹², released in 2005, states (on page 8) *“There is an industry concern that Australia will be left behind and frozen out of markets in the next 5 – 10 years if biotechnology is a tool not available to it.”* Indeed the strategic plan also recognises that *“Australian canola development is falling behind Canada, limiting the industry’s international competitiveness”*. It states, *“current oilseed genetics are not sufficient against weed resistance and the heavy reliance on one technology (TT) is a threat to the industry”*.

Healthier oils.

Signals are emerging from the global food industry (and some new food labelling requirements) that health and nutritional aspects of fats must be addressed, for example, through reduction in trans fatty acids. This is reflected in Canadian canola production where there is an increasing interest in growing specialty oils, delivering value-added returns to farmers. From 2004 to 2005, the market share of specialty oil canola varieties in Canada grew from 9.3% to 11.9%. In 2005, 5% of the Canadian canola area was sown to new high oleic acid varieties that attracted premiums of \$75 CAD/tonne when exported to an expanding US and Japanese market. This is expected to increase markedly in future years.

Notably, the food industry is also driving the desirability to combine the efficiency of hybrids with specialty oil traits, in order to deliver healthier oils and food products to consumers at an efficient and competitive production rate.

In 2005, Cargill and Bayer CropScience formed an alliance in North America to produce high yielding specialty canola for the supply of high stability oil to Cargill’s food industry customers. This alliance also intends to collaborate on research to develop other desirable oil traits, with a goal of accelerating the supply of canola varieties that produce high stability oil with improved nutritional composition.

¹¹ a. Bayer CropScience Canola Yield and Herbicide Trial results. Trial Summary. Canola News. The Canola Association of Australia Inc. July 2005.

b. Crop Updates 2004 Oilseeds.

c. GM Canola: An information Package. (pp 89-90) ACIL Tasman July 2007 (see reference No. 2)

¹² Australian Oilseed Federation Strategic Plan 2010

In the announcement of the alliance, Cargill Corporate Vice President Scott Portnoy said. *“Historically, specialty trait crops haven’t achieved large-scale use due to the complexity of managing the total system from seed research through production to the end user. Bayer and Cargill working together can build a system capable of delivering special characteristics in the volumes necessary for today’s marketplace.”* This year has seen Bayer CropScience and Cargill jointly launch a specialty oil product called “InVigor Health hybrid canola” which has been developed for the North American market, with high oleic oil content. This opportunity is not currently available to Australian farmers. The disincentive for investment due to the moratorium legislation has meant that international companies have been reluctant to continue to invest in Australian agriculture when there is no clear path to market.

The value and opportunity for specialty oil production in Australia is recognised by the industry with some small progress via conventional breeding efforts, for example, with Monola[®] production under identity preserved conditions. In 2005, the CSIRO Food Futures Flagship announced a breakthrough in developing plants containing a healthy omega-3 oil component, normally only available in significant amounts from fish sources and vital for human health, representing an opportunity for providing new high value crops in the future, though this product is also under the same moratorium cloud.

Bayer CropScience's canola breeding program for Australian GM hybrid varieties remains limited and any future investment into the program may depend on the outcomes of the moratorium review. Bayer CropScience has made a significant investment in its canola activities in Australia over the past 10 years. It has remained here with the hope that one day Australian farmers may have access to the technology and therefore a significant gearing up lag time could be avoided. Nonetheless, even if the moratorium were lifted today, it would require several years of breeding and variety development work to make available sufficient quantities of suitable commercial varieties.

Whilst Australia plays an important role as an alternative canola innovation and breeding location for Bayer CropScience's global business, its role and location remain under continual review based on freedom to operate and costs - especially those imposed through compliance conditions associated with the State moratoria legislation and the prevention of a commercial business.

Marketplace assessment

A number of independent studies have been conducted on the impact of the introduction of GM canola on Australia's ability to continue to access its overseas markets¹. These studies have all, unequivocally and without exception, concluded that Australia's access to export markets is at low risk if GM canola were grown commercially in Australia, i.e., markets would either not be affected or be only minimally affected. On the other hand,

studies have also suggested that Australia's competitive and sustainable position will be compromised if GM crops are not introduced as new tools and options for farmers¹³.

Canada and Australia compete for the same key canola markets. Canada grows on average about four times more canola than Australia and therefore, has more at stake, yet adoption of GM varieties continues to grow within Canada. In Canada, where GM and non-GM canola are not segregated, canola exports have continued to grow. Canada dominates the world canola trade, providing 42% of world exports. Furthermore, Canadian GM canola is not segregated, so that GM and non-GM canola are co-mingled and has to be designated as GM canola. In spite of this, Canada continues to export to predominantly the same canola markets as Australia (see table below). For example, Australia's main canola markets, including Japan, China, Pakistan and Bangladesh, are also importing Canada's GM canola.

Table 2. Comparison of Canadian and Australian canola export destinations

| '000 metric tonnes | | | | | | | | | | |
|--------------------|------|------|------|-----|------|-----|------|-----|------|-----|
| | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | |
| | Can | Aust | Can | Aus | Can | Aus | Can | Aus | Can | Aus |
| Japan | 1557 | 446 | 1682 | 379 | 1642 | 681 | 1915 | 396 | 1982 | 312 |
| China | 66 | 386 | 319 | 0 | 324 | 2 | 367 | 40 | 543 | 3 |
| Pakistan | 0 | 307 | 398 | 142 | 49 | 289 | 167 | 326 | 664 | 50 |
| Bangladesh | 0 | 115 | 13 | 81 | 22 | 103 | 23 | 66 | 87 | 30 |
| EU | 8 | 63 | 2 | 1 | 2 | 94 | 2 | 0 | 2 | 287 |
| US | 157 | - | 113 | - | 453 | - | 443 | - | 668 | - |
| Mexico | 489 | - | 693 | - | 1066 | - | 1049 | - | 1109 | - |
| Malaysia | - | 11 | - | 1 | - | 3 | - | 0 | - | - |

ABARE Data (www.abareconomics.com)

The latest GM canola varieties now grown in Canada will lift the yields of Canadian farmers by up to 30 percent compared to competing varieties - or an extra 2 million tonnes, (taking total canola production to be around 8 million tonnes). Theoretically, the extra 2 million tonnes available from Canada's new biotech varieties, is more than Australia's total average annual canola production of 1.5 million tonnes, and it comes at virtually no extra cost to the Canadian grower – indeed Canadian growers have reported savings especially in fuel⁸. There are no significant price premiums for non GM canola. The great bulk of GM canola is sold at very similar prices to conventional canola in most major canola markets throughout the world. As there is no sustained premium paid¹⁴ for non-GM canola this represents a significant competitive advantage of higher yields, as well as lower chemical, fuel and tillage costs for Canadian farmers over Australian farmers.

¹³ Transgenic Crops: Welfare implications for Australia, Stephen Apted, Daniel McDonald and Heidi Rodgers. (2005) ABARE, Australian Commodities, Vol 13, No.3 Sept quarter 2005

¹⁴ GM Grains in Australia Identity Preservation
ABARE Research Report 06.25
Max Foster, December 2006

Currently demand for global oilseed production is at a high and production is failing to keep up with demand. The rapidly emerging biofuels market, supported in many instances by Government renewable fuel targets, has been somewhat responsible for this increased demand. There is also strong demand for oilseeds from Asia and the Indian sub-continent. It is likely the demand for canola will remain strong for the foreseeable future with markets expanding rather than contracting⁷.

The Australian Oilseeds Federation sees the introduction of GM canola as providing another product of choice for growers as conventional canola fails to secure a price premium. From an average annual import of 2.1 million tonnes of canola into Japan, only about 50 000 tonnes of this was channeled to specifically non-GM requirements. In the vast majority of cases, the non-GM integrity of Australian canola is lost following discharge in Japan where it is blended with Canadian canola.

An assessment of the situation in each major country of export for Australia is presented below.

Japan

Japan is Australia's predominant export market for canola. It is also the major export destination for Canadian canola. The GM canola approved by the OGTR for commercialisation in Australia is currently approved for food and feed use in Japan and for import. The introduction of GM canola into Australian agriculture would have no impact on exports to Japan.

Canada is the major exporter of canola to Japan. Almost all of the canola is exported as GM canola. Australian non-GM canola exported to Japan is not segregated from Canadian GM canola but is co-mingled with it. There is a minute portion exported as non-GM canola for the specialty customer but the bulk of the commodity export is not segregated.

China

China is another important export destination for Australian and Canadian canola. China now requires safety certificates for imports of GM canola. These safety import certificates are available for the same GM canola approved by the OGTR for commercial production in Australia.

Buyers for China are very much motivated by price and will predominantly buy based on the cheapest price. Australian canola supplies to China would only be advantaged if they could be delivered at a lower price compared with Canada. It can be expected that Canadian canola will continue to out-compete Australian canola exports to China, especially if Australian competitiveness is adversely affected due to missing out on production advantages offered by GM technology. The strong motivation of Chinese buyers to buy at the lowest price makes it very unlikely for any premiums for non-GM canola to develop in this market.

Pakistan and Bangladesh

Pakistan and Bangladesh continue to accept GM canola. No regulatory impediments are currently in place. The Canola Council of Canada's report this year entitled "Canola Growing Great 2015" states that "*Pakistan is a committed canola buyer⁷ of Australian canola. However, Canada has been able to make significant sales to Pakistan recently, but if Australian supplies increase considerably...the level of Canadian canola could stabilise or decline.*"

European Union

This is an opportunistic market. In some years no canola imports from Australia occur. The experience of Canada has been that in spite of losing access to the EU for non-approved GM canola varieties, it achieved record exports of canola with larger markets being found in Japan, China and Mexico.

GM canola oil approved in Australia has also been approved for consumption for many years in the EU, and Canada continues to export processed GM canola oil to the EU. Earlier this year, Roundup Ready Canola and InVigor hybrid canola have also been approved for import into the EU.

The best way for Australia to preserve its access to markets is to ensure it remains competitive and GM technology offers this opportunity. At present no advantage has been identified for countries maintaining a solely non-GM production system whereas the Canadian experience points very clearly to the advantages of adopting GM technology. The fact that GM canola varieties are grown on about 85% of Canadian canola acres is testimony in itself.

In 2006, due to the drought and domestic supply shortages, a major grain trader successfully imported GM canola into Australia without any adverse effects on domestic markets. It is ironic that while Australian farmers are not allowed to grow GM canola approved by the OGTR to improve their productivity, imports of the same types of GM canola are allowed and necessary to meet crushing requirements.

The Canola Council of Canada's strategic vision to 2015 expects the market for canola oil to expand rather than contract and has an ambitious plan to take the Canadian canola production from 8 million tonnes to 15 million tonnes⁷. Among the drivers for this expansion is the biodiesel market. For example the EU has set aggressive renewable fuel targets of 5.75% by 2010 and to move to 10% by 2020. The Canadian analysis concludes that even should the EU market remain closed to seed imports, they will see an increase in demand for Canadian canola oil as canola shipments are made to countries outside the EU (eg Dubai in Saudi Arabia) for crushing and processing before eventual import by the EU.

South Korea

GM canola has been approved for import into South Korea. There is no impediment for GM canola export to this country.

Labelling

Canola oil is highly refined and contains no detectable DNA or protein. As such GM canola oil is identical and indistinguishable from conventional canola oil. GM canola is not required to be labelled anywhere in the above countries except in the EU where foods derived from GM crops such as canola, are identified on product labels.

Potential benefits

The benefits of current GM technology are well documented in independent studies¹⁵. They consist of economic, agronomic and environmental benefits. Benefits include yield improvements, reduction in pesticide use and reduction in input costs such as fuel usage due to a reduced need for tillage to control weeds. The latter also leads to improved soil structure and reduction in topsoil erosion.

On average, Canadian farmers can expect at least a 10% increase in yield (this includes Roundup Ready varieties) with an associated increase in total costs of 3%. (The best InVigor hybrid canola varieties currently available in Canada, give up to a 30% increase in yield over their competitor varieties¹⁶. InVigor hybrid varieties have consistently been the top yielding varieties for many consecutive years in Canada and currently are grown on 38% of the canola hectareage). Five year average Canadian canola yields increased by 15.8% in the ten years following the introduction of GM varieties in 1995/96. By comparison the five year average Australian canola yields declined by 13.9%^{1f}.

The benefits of GM canola can be summarised as follows:

- Helps in weed resistance management. Weed resistance is due to the repeated use of a chemical which acts as a selecting agent for resistance development. The availability of GM canola will allow the use of 2 new chemical groups of herbicides as alternatives in the rotation for resistance management.
- Promotes yield Increases – either from hybrid vigour or better weed control.
- Produces cleaner crops – Canadian farmers report lower dockage from contaminants (eg weed seeds) due to the more efficient weed control.

¹⁵ a. Gomez Barbero, M and Rodriguez-Cerezo, E. (December 2006), Economic Impact of dominant GM crops worldwide: a review. European Commissions Directorate General Joint research Centre. EUR22547 EN.

b. Brookes, G. and Barfoot, P. (December 2006) GM Crops: The First Ten Years – Global Socio Economic and Environmental Impacts.

c. Trigo, E. J. and Cap, E. J. (December 2006) Ten years of Genetically modified Crops in Argentine Agriculture.

d. Beckie, H.J. et al. A Decade of Herbicide-Resistant Crops in Canada. Can. J. Plant Sci. 85:

e. Fernandez-Cornejo, J. & M. Caswell. The First Decade of Genetically Engineered Crops in the United States. USDA Economic Information Bulletin No. 11. April 2006.

¹⁶ Prairie Canola Variety Trials. PCVT All Seasons Zone Summary 2006.
http://81.137.139.227/pod3/pcvt_summary_2006.html

- Promotes conservation and no-till farming systems. This means less cultivation leading to savings in fuel use (less greenhouse gas), greater soil moisture conservation and less subsequent soil compaction.
- GM canola allows earlier sowing, promoting more efficient use of subsoil moisture. For example, this allows growers to sow dry or at the first rains, and delay weed control until the weeds emerge in-crop. This will enable more canola to be sown early, as well as encouraging the sowing of canola in no-till situations. It has been estimated that up to a 5% yield benefit can result from one week earlier sowing¹⁰.
- Less use of pesticides. The ability to spray herbicides over a GM canola crop allows farmers to spray post-emergent and only when weeds pose a problem. In some situations, this may remove the need to apply pre-emergent herbicides, saving on costs, time and fuel. In Canada, the move to herbicide tolerant canola varieties has meant less total herbicides applied (in the order of 1,500 to 6,000 tonnes less herbicide used from 1997 to 2000⁸).
- Improved crop selection. The non-residual nature of the herbicides used on GM crops allows growers to delay crop selection as close as possible to the season break without locking a paddock into a particular crop because of the pre sowing herbicides used. Similarly, in the event of a crop failure, there would be no restriction on the type of crop that could be replanted.

Benefits on downstream industries

Within the Canadian grain exporters and processors community, there has been a high level of interest (initially expressed as concern) and willingness to understand the development of biotechnology regulations and product approvals. The exporters and processors have come to recognise that this technology holds great promise for their portion of the food value chain. For example, InVigor hybrid canola, which was designed to benefit farmers, characteristically produces very high grade seed. This improvement in seed quality clearly benefits the processors, not just the farmers. The processors and exporters now seek to capitalise on the value inherent in the high grade seed especially in export markets and what was once seen as a risk is now seen as an opportunity. It can be expected that this opportunity will also be realised for a similar sector of the Australian industry if InVigor hybrid canola is commercialised.

Effect on other grains industries

Exports of crops such as soybean, corn and canola from Canada and the USA have not been adversely affected by the introduction of GM varieties. US soybean exports in 2001 reached an all time high although over 80% of the US soybean crop was GM.

The EU, often cited as a non-GM market, in fact currently grow more GM grains (Bt maize) than Australia and also imports large quantities of GM feed products such as GM soy. A recent report on the use of GM products for animal feed in the EU showed that the

EU relies heavily on imported feed from the US, Argentina and Brazil which included mainly GM feed¹⁷. The EU is dependent on soybean and soybean meal imports for which no substitutes are available in sufficient quantities (about 91% of all soybean grown in US is GM soy). Only 10-20% of imports could be replaced by substitutes. Other countries such as Japan and China have also continued to import grain for feed, including GM grain from a variety of sources.

The Australian Barley Board (ABB Limited) and the Australian Wheat Board (AWB) have at times declared publicly that export of cereal grains might be negatively impacted. This is contradictory to the Canadian experience where GM canola represents about 85% of the canola production in Canada with no impact on Canadian cereal grains export. A recent study by Foster and French (2007)^{1a} concluded that there was no evidence of unintended traces of GM canola causing market acceptance problems for Canadian wheat and barley exports.

In the recent Agriculture Australia 2007 Conference in Melbourne, Randal Giroux from the Corporate Agricultural Biotechnology section of Cargill based in North America, was asked about GM canola contaminants affecting wheat and other grain exports to countries such as the EU from the US and Canada. Dr Giroux's response was that this was a non-issue for the North American exports. The canola contaminant in other grains was regarded as a biological contaminant and has never been flagged as an issue of whether it was GM or non-GM.

Published figures from Canada and the USA indicate that wheat importers such as Egypt, Japan, Philippines and Pakistan are still buying large quantities of wheat from the US and Canada.

There have been claims by the organic lobby that GM canola will adversely affect the marketability of organically grown products. A study by Apted and Mazur (2007)¹⁸ concluded that there will be negligible impact on organic production (organic canola, organic livestock and organic honey). In the US where GM crops are widely grown organic production continues to increase despite the increasing adoption of GM crops. For example in 1990 the US had under a million acres of certified organic farmland. This area had doubled in 2002 and doubled again between 2002-05. There has been no curtailing of organic production in the US. GM, conventional agriculture and organic agriculture continue to coexist successfully. In fact, in the US GM and organic production sometimes occur on the same farm without impediment (eg Terranova Farms in California).

¹⁷ Economic Impact of Unapproved GMOs on EU Feed Imports and Livestock Production
European Commission Directorate-General for Agriculture and Rural Development. 2007

¹⁸ Potential Impacts from the Introduction of GM Canola in Organic Farming in Australia. ABARE Research Report 07.11.
S. Apted and K. Mazur. May 2007

Premiums

There have been claims that non-GM canola has attracted premiums and that allowing a GM canola choice would see the premiums eroded. This claim cannot be substantiated. A study by ABARE^{1a,14} shows that there are no sustained premiums for non-GM canola. While there are niche markets for certified non-GM canola which offer a premium, these markets are extremely limited (eg less than 50 000 tonnes in total) and cater to niche markets.

Some growers of Australian canola may have been able to obtain higher prices than Canadian spot prices in the last year. However, it is impossible to attribute this to the non-GM component. Factors such as the drought, resulting in scarcity, undoubtedly contributed to the higher prices for Australian canola.

A comparison of the long-term prices between Canada and Australia during the years when GM has been commercialised in Canada show comparable export prices for the two countries (Foster and French 2007)^{1a}.

An opinion on premiums was given by our largest canola export handler, CBH/GrainPool, (personal communication) to the West Australian Ministerial GMO Industry Reference Group). The advice given to the WA Minister was that while there have been claims of a price advantage for Australian canola (ex Melbourne) over Canadian canola export prices (ex Pacific Coast) in the most recent season, this is a drought premium driven by the seasonal conditions on the east coast of Australia. It needs to be noted that prices ex Melbourne do not necessarily reflect prices ex WA.

- In season 99/00 – there was record world canola carryout, because of a huge crop in both Australia (2.4mmt) and Canada (8.7mmt);
- In season 02/03 – there was a drought in Australia (820k production, versus 1.5mmt the year before, and 1.6mmt the year after), increasing premiums;
- In season 06/07 – there was a drought in Australia, increasing premiums (firstly driven by Europe for biofuel, then by East Coast demand). Prices ex Melbourne was driven by domestic East Coast crush requirements. Those prices meant WA canola could be sold there at the best price available in the market and canola could be competitively shipped ex Canada to East Coast Australia.

These environmental factors have impacted on canola quality. In addition there has been a gradual change in relativity of quality between Australia and Canada over time. Australian canola used to be much better (a full 2% or so), but now it is equivalent but declining in comparison to Canada. This has also been reflected in prices.

The Japanese market is the largest canola importer in the world (approximately 2.2 mmt); the majority being of Canadian origin (approx 2.0mmt), and the remainder of Australian origin (0.2mmt).

The Japanese industry (JOPA) says it prefers non GM canola from Australia but, in reality, the crushers are mostly concerned about ensuring an alternate supply to Canada. (The recent merger between AU and Sas wheat pool in Canada is of concern in Japan because it has significantly decreased competition in the market).

A very small quantity of non GM (Australian) canola is handled, processed, refined, bottled and labelled as non GM canola oil in Japan. This is a niche market and by far, the majority of Australian and Canadian canola oil is blended, bottled and labelled as 'canola' oil (not 'non GM canola' oil) in Japan.

GrainPool is the largest Australian canola exporter to Japan and has annual supply agreements with all of their trade house intermediaries in Japan. GrainPool has a direct relationship with one of the largest canola crushers in Japan, which no other Australian grain marketer has achieved. GrainPool is the market leader in their approach to the management of canola chemical residue issues for exports to Japan, giving them a competitive advantage. This relationship with customers has also extracted some small premium from Japanese customers.

Japan will pay a premium for a small amount of Australian canola – above Canadian values – each year, but only for small tonnages. Japan will not pay this premium for any tonnage above this amount, and will in fact demand equivalent Canadian values, to purchase any additional tonnage. Canadian canola in season 2006/07 was 2 - 3% higher in oil, compared to Australian canola (45 - 46% v 42 – 43%), and on this basis, Japan will discount the value by an equivalent dollar amount.

Canadian canola is increasing in oil content, yield and planted hectares (and overall production) and has a 10 year plan for 15mmt of canola production by 2015) – current production is 8.5 – 9.5mmt. This plan involves a 30% increase in acreage (through shortening rotations, increasing non traditional acres and extra acres due to decreased costs of production) and 35% more yield (through hybrid adaptation, genetic gain, improved disease and insect resistance and net yield, stress and drought traits).

In the absence of drought, it can be expected that there will be downward pressure on prices over time, driven by Canada's improvements in both oil quality and production (driven by both improved yields and area sown). If GM is providing or facilitating the improvements being achieved in Canada, it can be expected that Australia will struggle to continue to be competitive in the marketing of Canola against Canada, without the adoption of GM technology.

In summary, last years premium for WA canola was achieved due to initial demand from Europe for biofuel (which did not eventuate), followed by a domestic (East Coast) drought premium for the domestic crush on the East Coast. (Unusually, GrainPool sold as much canola to the East Coast for season 2006/07, as it exported, because of the drought premium being paid).

There has been some premium paid in the past for Australian canola, however this cannot be attributed to being non GM, rather it is a premium to being an alternate supplier of canola with a higher oil content than Canadian canola at that time (i.e. season 2005/06), as well as a relationship benefit.

Segregation

The extent of any current non-GM canola premiums and market access difficulties for GM canola in world markets are not large enough to offset the agronomic benefits offered by GM canola (Foster 2003)^{1d}.

Farmers may wish to segregate non-GM from GM canola, although the necessity for doing this for marketing reasons is unclear as no sustained premiums are offered for non-GM canola Foster (Dec 2006)¹⁴.

Adventitious Presence (AP)

When GM canola was approved for food and for cultivation this means that food or seed for cultivation may consist entirely of the GM product or be entirely derived from it (i.e. consist of 100% GM).

The reality of agriculture is that this GM material may then occur in trace levels (AP) in non-GM products. This has no bearing on the safety of the non-GM product since the GM product is already approved (by OGTR and FSANZ) to be as safe as conventional products.

Before commercialisation of a GM product, companies ensure that approval is also obtained in the major countries of export of the commodity (see Industry Stewardship Initiatives below). This ensures that as the GM product is approved, AP will not be an issue in those countries where the product is approved and no legislated thresholds are necessary.

The setting of thresholds for AP is only required with regards to labelling or when specified in individual contracts. Many countries, including Australia, have established thresholds below which a product may be labelled as non-GM or not require to be labelled as GM. This is shown in the table below.

Table 3. Summary of International Thresholds

| Country | Threshold level | Type of approval | Regulator | Comments |
|--------------|-----------------|-----------------------|----------------------|---|
| Australia | 1% | Food | FSANZ | Labelling required if >1% |
| EU | 0.9% | Food | Directive 2001/18/EC | Labelling required if >0.9% if inadvertent |
| Brazil | 1% | Cottonseed | CTNBio | AP level set for GM cotton in non-GM cotton |
| | 1% | Food | MAPA | Labelling required if >1% |
| Japan | 1% | Animal feed | MAFF | Tolerance of 1% for events approved in OECD country |
| | 5% | Food | MAFF/MHLW | Labelling required if >5% for approved events. GM free label allowed if GM content <5%. |
| Korea | 3% | Bulk commodity | MAFF | Labelling required if >3% |
| USA | NA | NA | FDA | Labelling not required if approved |
| Thailand | 5% | Food | Thai FDA | Labelling required if >5% and is one of the top 3 ingredients |
| Saudi Arabia | 1% | Food, feed, seed, etc | MOC | Labelling required if >1% |
| Malaysia | 3% | Food | DFQC | Labelling may be required if >3% |

In Australia, we have the unique situation whereby GM canola were approved by the OGTR but prohibited under State legislations. When trace levels of OGTR approved GM canola was found in non-GM canola supplies in 2005, this meant that the occurrence of AP breached State legislations. This made it necessary for the States to establish threshold levels below which the occurrence of AP would not be illegal. Currently the level accepted under the current moratorium legislation is 0.9% for commodity grain and 0.5% for sowing seed. If the State moratoriums were to be lifted there would be no requirement to keep the AP thresholds currently established under State legislations.

Individual contracts may specify particular AP levels in goods delivered but there is no need for these levels to be legislated as they are specified in private transactions and mandated by contractual agreements.

The AP levels established under the various State moratorium legislations in Australian canola in the past few years have not had any adverse effects on our export markets. This provides further evidence that there is minimal sensitivity to GM and that it is practical to work to a realistic level of AP of GM in non-GM.

GM Feed and the Dairy and Livestock industry

GM crops are assessed globally for their feed safety. The global demand for competitive and sustainable production of feed grains is driving much of the interest in GM crops, especially to gain efficiencies in soybean and corn production.

The feedlot and stockfeed supply chain is a diverse set of supply networks that constantly change as lot-feeders alter the composition of their rations to optimise nutrition and minimise cost. A single crop can be the source of several stockfeed ingredients including grains, seed meal, hay and silage. A single stockfeed ingredient can enter the ration through one of several pathways including directly from a domestic producer, via imports, through manufacturers of stockfeed or human food and via agents and marketers.

The potential market demand for feedlot livestock raised solely on non-GM feed remains uncertain. A supply chain management approach would be required to demonstrate that animals have not consumed stockfeed containing GM products, because end point testing of animal products is not able to determine the GM status of feeds consumed. Given the wide range of supply chain arrangements potentially used by any one feedlot, it would currently be difficult for producers to assure customers that their feed did not contain GM material if their rations contained cottonseed, imported soybeans or imported maize. This situation is analogous for livestock producers in Europe where imported soy and maize are used in stockfeed and it is difficult to acquire sufficient quantities of non-GM feed supplies of these grains. In North America, there is little or no segregation of GM and non-GM soybeans, maize, cotton and canola used in stockfeed.¹⁹

In Japan, one of the major markets being quoted by the dairy industry as demanding non-GM fed beef and dairy, large quantities of GM grains are purchased from the US and Canada for intensive livestock feeding.

The Australian dairy industry itself currently has a range of interests and involvement in developing products based on modern biotechnology – including pasture improvements (bloat resistant), animal breeding (cloning), veterinary medicines (vaccines) and consumer driven milk products (healthier milk).

GM canola meal, as a by-product of the oilseed industry is a source of animal feed protein which is traded globally and generally used in poultry, pig, cattle and specialty feed rations including aquaculture. Canola meal has a good amino acid profile for animal feeding. Like many vegetable protein sources canola meal is limited in lysine but it is noted for having high levels of methionine and cystine. It is considered to be a complementary protein feed source, often added to other protein sources such as soybean oil and peas. Currently, imported GM soybean meal and domestically produced cottonseed meal is utilised in dairy rations and for the stockfeed industry generally, with no market impacts^{11c}.

¹⁹ AFFA report by C.F. Lamp & C. Cunningham, Tracking Potential GM Inputs to the Stockfeed supply chain for Feedlot Beef: a discussion paper.

Protein meal is generally used as a supplement for dairy cattle and comprises a proportion of their total diet. Currently milk processors limit the inclusion of GM feed ingredients to 5% in lactating cow feeds. This threshold level is not expected to be exceeded under current feed utilisation even when the feed consists of mainly GM protein^{11c} (Pg 65-68 - GM Canola: An information Package. ACIL Tasman July 2007).

The Australian Dairy industry, in June 2007, endorsed a pro-choice GM position allowing the growers and the market to decide if they want to use GM, acknowledging feed supplies already include Australian GM cotton and imported GM ingredients to meet stockfeed specifications and market requirements.

At this stage the Australian Poultry Industry Association, which represents the chicken meat industry, has also shown no objection to the use of GM feed ingredients. Similarly the egg layer industry has not expressed concern over the use of GM feed material in chicken rations^{11c}.

Honey & Bee industry

The bee and honey industry has undertaken consultation and informed discussion with technology developers and the GM crop industry for several years. Bayer CropScience has also provided detailed presentations and briefings on its GM canola and data on bees and honey at State apiarist association conferences and to the Australian Honey Bee Industry Council (AHBIC).

Safety studies on bees foraging GM canola have been conducted as part of the regulatory package supporting InVigor hybrid canola. These studies have been evaluated by regulators in many countries who have arrived at the same conclusion: that the health and safety of bees foraging InVigor hybrid canola is not adversely affected. The regulatory assessments completed by OGTR and FSANZ provide further references on the bee safety data.

Bee involvement in cross pollination over distances has also been studied closely in relation to risk management for GM canola trials.²⁰

Whilst bees are able to travel a range of distances, cross pollination would only occur if the bees visit canola plants with flowers not already fertilised by the mass of pollen immediately around them and assuming that the pollen the bees carry is still viable. Canola pollen loses its viability within hours after leaving the flower. Cross pollination events occurring as a result of bee activity is not significant and will not impact existing trade specifications for non GM canola supplies.

Pollen is regarded as a minor contaminant of honey and is generally present as less than 0.1% in sieved commercial honey. It is possible that genes from GM canola could be present in honey however, as confirmed by the OGTR review, this does not pose a health

²⁰ Baker, J (2006) Herbicide resistant sting in honeybees tail, Australasian science, pp41-42.

issue since DNA is rapidly broken down in our digestive systems and dealt with in the same manner as the DNA of any other gene of any other food. GM proteins may be detected in fresh pollen if this is added to honey, however, proteins are rapidly degraded by heat and physical movement and are generally not found in commercial honey.

Honey created from bees foraging GM canola is not considered a GM food and does not require labelling in Australia or any overseas markets including Europe. Threshold levels established to regulate labelling for GM foods on a global basis are unlikely to be exceeded by the minute amounts of pollen present in honey (see Table 3 above).

As GM canola is no different to conventional canola, as confirmed by the OGTR, it is not expected to have any adverse effect on honeybees nor on the national honeybee industry.

The impact on organic honey production is also expected to be minimal¹³. GM canola is most likely to be planted as an alternative to conventional canola, which is also unsuitable for organic honey production. Planting a crop not permitted in organic agriculture in place of conventional canola, which for pesticide residue reasons cannot usually be grown in the vicinity of organic hives, would have no additional effect on organic honey production.

Action at the World Trade Organisation venue

In 2003 USA, Canada and Argentina applied to the WTO (supported by countries like Australia), charging that the EU, through their stance on non-approval of GM crops contravened WTO rules on artificial barriers to trade between countries. In February 2006, the WTO ruled that the EU had breached WTO rules. State prohibitions on cultivation and commercialisation of GM crops may leave Australia open to such international challenges. The USA currently keeps a close watch on the situations in Australia²¹. Possibly no action has been taken to date because of the notion that the State legislations are “moratorium” legislations. That is, as per the concept of moratorium, the constraints are of a temporary nature. It remains to be seen if countries like the US will take action against Australia in the WTO if the moratorium legislations are extended indefinitely.

Liability

There has been discussion about possible liability issues arising out of GM crop cultivation. These issues have been examined closely²² and the expert consensus is that our current laws and jurisprudence are more than adequate to deal with any issues arising from GM cultivation. In fact, liability arising from GM issues is no different from liability arising from other activities and current liability laws are designed to cater for such eventualities.

²¹ USDA Foreign Agricultural Service GAIN Report, Australia Biotechnology Agricultural Biotechnology Annual Report 2007

²² a. ACIL Tasman (2005) Managing GM crops in Australia: GM crops segregation and liability in Australia
b. NZ Royal Commission Report on Liability 2001
c. Liability Issues Associated with GM Crops in Australia

This is supported by current experience with production of GM cotton in which there is no evidence, after more than 10 years of growing GM cotton, that any special liability regime needs to be introduced. In addition, in North America, arguably the most litigious region of the world, where GM crops have been grown for more than a decade, there is also no evidence that any special liability regime is required. Recourse to common law has been completely adequate and effective.

Implementation of strict liability is completely inappropriate. Such laws should only be used when dealing with extremely dangerous activities. GM crop cultivation is not in such a category and in fact the OGTR has determined that GM canola is as safe as conventional canola.

Industry preparedness

It is highly unusual for governments to legislatively deny access to a new and innovative technology which has significant potential to add to farmers' productivity. Legislative control is understandable to regulate threats to human safety or the environment but in the case of commercial risks, this has always been left to market forces. It is difficult to justify government control (i.e. prohibition of cultivation of GM canola) based on the undocumented perception of threats to markets, for every independent study on this topic has shown evidence to the contrary¹. It was noted during the review of the Commonwealth's GT Act that it was "*most unusual for States to intervene in the agricultural market in this manner and this type of intervention would usually only be taken when there is strong and compelling evidence of a market failure.*"

The Australian grains industry recognises that gene technology is important and has a significant role to play in Australian agriculture. Through its Single Vision Grains Australia (SVGA) initiative it engaged the supply chain members from the grains industry to determine if and how GM crops should be introduced into the Australian agricultural marketplace. A feature of the initiative was the breadth of industry engagement and consultation which included grain and seed growers grain transporters, marketers and processors; technology developers, scientists and researchers; grain handlers, storage operators and industry sector representative bodies.

The process identified that government regulations in the area of market effects is not warranted and that the grains industry itself is able to manage market effects of GM crops.

The ability to supply an agricultural product differentiated in attribute from similar agricultural products (i.e. an identity preserved product) is commonplace in many crops and production systems today. For example, seed breeders have managed seed purity for many years to agreed levels through machinery hygiene, separation distance and other crop management techniques. The concept is not new and wheat, barley and many other grains are currently segregated by quality parameters or customer requirements. For example, the grains supply chain currently commonly segregates dozens of different varieties and grades of wheat. As currently practised, the SVGA initiative found that the

grains industry has the expertise and capability to implement the processes required to facilitate the introduction of GM crops to any specified practical standard. In other words, the industry is capable of offering choice to farmers of whether they wish to grow GM or non-GM crops. The SVGA initiative, found that stakeholders (eg technology developers, the seed industry, farmers, transport organisations, handling and storage facility operators, marketers and processors) are either ready to, or can, implement the appropriate processes to manage GM crops if commercialised, to meet marketplace, trade and regulatory requirements. The grains industry (including Bayer CropScience as one participant) has endorsed the document titled "Delivering Market Choice with GM canola" which shows that GM canola may be introduced without adverse impacts on our markets²³. SVGA has documented the processes for handling GM canola, while enabling non-GM canola production to proceed as a separate stream, in the *Principles For Process Management Of Grain Within The Australian Supply Chain: An environment where GM and non-GM grain is marketed*²⁴

Through the SVGA initiative, major grains industry partners are now calling for the moratoriums to be lifted. The reasons for this support were nominated as including scientific and community acceptance of the role, safety and value of approved GM canola, advances in agricultural sustainability and productivity, international competitiveness, resource and infrastructure utilization, and provide incentive for future R&D investment.

Farmers in all States (as voiced by the pro-choice policies of their respective representative industry associations) now want to be able to exercise choice for themselves. All State Farmer Federations (in addition to the National Farmers Federation), representing the majority of Australia's grain farmers, are now calling for the immediate lifting of the moratoriums so farmers can have access to GM crops (in particular GM canola). For example, in the last month, the membership of NSWFF and the VFF both voted overwhelmingly at their respective Annual General Meetings for the moratoriums to be lifted immediately. Farmers in all States now want to be able to exercise choice for themselves.

In September 2006, Heather Baldock, RIRDC SA's Rural Women's Award Winner for 2006 carried out a series of fora in which she surveyed farmers' attitudes among those attending. One of her key findings was that 80% of respondents believe Australian farmers should have access to approved GM crops and 87% believe GM crops have potential to offer benefits²⁵.

Biotechnology Australia released their latest public acceptance survey results in July 2007. They found that, "*When asked if GM crops should be grown in their state, 50% of respondents from all states said Yes, with a further 30% approving as long as they were*

²³ Delivering Market Choice with GM canola. An industry report prepared under the Single Vision Grains Australia process.

²⁴ Principles for Process Management of Grain within the Australia Supply Chain: A guide for industry in an environment where GM and non-GM grain is marketed. An industry report prepared under the Single Vision Grains Australia process.

²⁵ Report of GM Forum Roadshow 2006

Heather Baldock, RIRDC 2006 SA Rural Women's Award Winner, Sept. 2006

strongly regulated.” The key finding was that public support for GM crops has risen dramatically from 46% in 2005 to 73% in 2007²⁶.

With regards to canola in particular, in addition to independent expert studies already undertaken¹, there is consensus among key major grains industry partners that there is no evidence of market failure and that GM canola may be commercialised without any adverse effects on markets.

It has always been the intention of the Australian grains industry to ensure a well-managed process for the introduction of GM canola. This means a gradual introduction of GM canola over time clearly demonstrating the principles agreed by industry and government for coexistence with non-GM canola. Industry is confident that there will be no adverse impacts on Australia’s markets. The necessary steps are in place for introducing commercial GM canola that will provide comfort and confidence to other participants in the agricultural sector and the public.

Bayer CropScience endorses the grain industry objectives to:

- enable each grain supply chain participant to competitively meet the requirements of their chosen market, recognising that these requirements will ultimately be determined by consumer preference and regulatory requirements.
- enable the release of genetically modified crops into the environment in a manner that maintains or enhances the natural resource base and minimises the offsite impacts of agricultural and related activities.
- enable producers to utilise technologies most appropriate to their chosen farming system. (Choice for farmers)
- enable the incorporation of genetically modified crops into individual farming systems using crop management techniques that maximise the effective life of the technology.

The case for GM canola is clear. The main industry participants are agreed that there is no impediment to the commercialisation of GM canola and all supply chain processes are currently capable of facilitating the introduction of GM canola. The legislation prohibiting the cultivation of GM canola is not required and is, in fact, counter productive for the Australian agricultural economy.

Industry stewardship initiatives

In July this year, BIO announced the first industry-coordinated stewardship program, *Excellence Through Stewardship: Advancing Best Practices in Agricultural Biotechnology* that will promote the responsible management of plant biotechnology. BIO is an industry organisation based in the USA and its membership includes the major technology providers like Bayer, Monsanto, Syngenta, Dupont and BASF as well as many other

²⁶ Refer to Biotechnology Australia website: <http://www.biotechnology.gov.au/index.cfm?event=object.showWhatsNew>

hundreds of biotechnology companies. These stewardship initiatives are adopted globally including by the local subsidiaries of these companies.

Excellence Through Stewardship continues the commitment to promoting good product stewardship and implementing quality management programs. The program provides new comprehensive, best practices to be implemented by all companies involved with plant biotechnology. Excellence Through Stewardship is intended to promote the responsible management of agricultural biotechnology, the continued adoption of plant biotechnology globally, and the enhanced value of biotech-derived plant products in the marketplace. This is the first program that meets today's product stewardship challenges and provides a strong quality management program (QMP) for the full life cycle of biotech plants into the future. For more information about the Excellence Through Stewardship program, visit www.ExcellenceThroughStewardship.org.

Bayer CropScience fully supports and is actively engaged in the development of the Excellence Through Stewardship initiative. We have a strong stewardship program in place within Bayer and we believe the development of the Excellence Through Stewardship initiative will further assist companies of all sizes as we share and develop an industry best practices approach.

Disincentives for investment

The impact of the current moratorium imposed on GM crops by the State government has created uncertainty with regards to the ability of companies to commercialise their GM products even after millions of dollars of investment and getting approval after undergoing a rigorous process of assessment by three regulatory agencies: the OGTR, FSANZ and APVMA. The moratorium legislations were introduced at the "last minute" after all regulatory approvals were granted. Such an unforeseen set back, would have debilitated any small start-up company.

This situation has resulted in a dampening effect on the progress for research and development in agricultural biotechnology with one major company pulling out of any investment into its oilseeds program directly because of the moratorium and Bayer CropScience has significantly limited its investments and breeding activities.

In Australia, State moratorium legislation has denied growers choice and the right to access safe and better varieties of crops. Faced with the effects of climate change, Australian growers are being denied access to the best varieties and consequently being left behind in the global markets.

Australian agricultural innovation is of utmost importance and has kept the industry competitive and viable through the years. Biotechnology is undoubtedly crucial to the future of Australia economically. In view of this, there must be incentives and encouragement for industry to invest in all forms of innovative technology.

For example, the report by the Agriculture and Food Policy Reference Group released in February 2006, entitled *Creating Our Future – Agriculture and Food Policy for the Next Generation*, recognised that *“The capacity of Australian farmers to remain globally competitive is unquestionably threatened by continued bans and restrictions on cultivating GM crops.”* The report recommended that, *“In view of the potentially significant human health, environmental and economic benefits from using biotechnology in agriculture and food production, and the costs to Australians of failing to capture them, agriculture and food businesses should work with governments to facilitate the rapid uptake of agrifood biotechnologies...and state governments should lift their moratoriums on the commercial use of GM crops immediately....”*²⁷

The report, *Transgenic Crops: Welfare implications for Australia*, Apted, S. et al. (2005)¹³, concluded Australia stands to lose between \$1.5Billion and \$5.8 Billion within the next 10 years if GM crops are not adopted.:

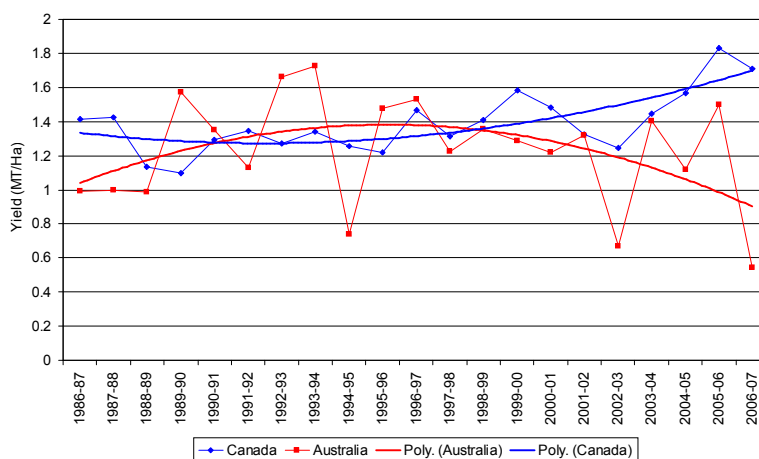
“The current moratoriums are having a negative impact on Australia’s research and development effort, and Australia risks being left behind as other nations embrace innovations in transgenic crop development”.

The State moratoriums pose a risk for Australia’s agricultural economy. GM canola provides significant economic and environmental advantages, worth a conservative estimate of \$135 million annually to the wheat and canola industries in Australia, thus the current moratorium has already cost Australia some \$540 million in the four years of the moratorium. (Norton 2003¹⁰). NSW grows on average about 20% of the domestic market, thus the cost to NSW will already be about \$108 million in the last four years since the start of the moratorium.

The GM crop moratorium is hampering progress of breeding and development of not only GM varieties but also conventional canola varieties, due to lack of certainty for the seed industry as a whole. The graph below shows the comparative yields between Canada and Australia over the years. Yields in Canada continue to increase while yields in Australia are on the decline. Access to GM technology and active investment into innovation and research has increased Canada’s productivity compared to that in Australia (see graph below).

²⁷, *Creating Our Future – Agriculture and Food Policy for the Next Generation* Agriculture. Food Policy Reference Group, February 2006

Comparative canola yields – Australia and Canada



Source: ABARE Australian Commodities – March 2007

The implications of these threats on canola extend also to negatively impact other grain cropping due to the important role canola plays in a wheat rotation, adding a cereal weed resistance break and other agronomic advantages¹⁰. If yield and production efficiencies in canola cannot keep pace with similar advances in wheat production, then farmers are less inclined to grow canola in their rotation and will seek alternative crops. A diminishing market supply of consistent high quality canola is a threat to grain traders. The oilseed industry has recognized the challenge to maintain a critical mass, ensuring continued investment and innovation is delivered for canola in order to grow its contribution to exports and ultimately generate better returns for those involved along its supply chain.

Evidence to date show that where GM canola and other GM crops have been commercialised overseas, they have not produced any adverse effects on trade and market access. On the contrary, adoption has in fact been beneficial for farmers. The Australian oilseeds industry is in dire need of this technology to help with its longer term viability.

Currently, apart from canola, there are no other GM grain crops near commercialisation. If the uncertainties fostered by the various State legislations persist, we can expect this situation to continue.

Conclusion

Bayer CropScience's canola breeding program for Australian GM hybrid varieties remains limited and any future investment into the program may depend on the outcomes of the moratorium review. Bayer CropScience has made a significant investment in its canola activities in Australia over the past 10 years. It has remained here with the hope that one day Australian farmers may have access to the technology and therefore a significant gearing up lag time could be avoided. If the moratorium was to continue Bayer CropScience would of course have to re-examine continuing involvement in its current program in Australia.

State moratorium legislation has denied growers choice and the right to access safe and better varieties of GM canola.

Evidence to date show that adoption of GM canola will produce benefits for the Australian canola grower. It is evident that the Australian oilseeds industry is in dire need of this technology to help with its longer term viability. Numerous independent reports as well as overseas experience show that where GM canola has been commercialised elsewhere in the world, it has not produced any adverse effects on trade and has net benefits for the industry.

The moratorium order prohibiting the cultivation and thus the commercialisation of GM canola has been deleterious and has disadvantaged Australian growers, who merely ask for a chance to decide for themselves what they grow on their farms. In our opinion farmers must be given the choice. The Act is no longer required as it can be replaced by an industry initiative that can manage the commercialisation of GM crops. At the very least, the order prohibiting cultivation of GM canola must be allowed to lapse to allow farmers choice and access to GM canola.