



Information Paper 12

GM crops and the marketplace

Two herbicide tolerant genetically modified (GM) canola varieties were approved by the Office of the Gene Technology Regulator (OGTR) in 2003. Concerns about the market impact of GM canola led to moratoria being imposed by some state governments on the commercial production of GM canola varieties.

These concerns can be broadly considered as:

1. Australia would lose canola markets by opting to adopt GM varieties.
2. Price premiums for Australia's non-GM canola would be lost.
3. Other Australian crops, such as wheat and barley, could see their markets jeopardised because of the unintended presence of GM canola in their shipments.

There is growing evidence to support the fact that these concerns are no longer relevant. This includes the increasing global uptake of GM crops and a number of reports addressing various market access issues produced by the Australian Bureau of Agricultural and Resource Economics (ABARE).

In 2007-08 the New South Wales (NSW), Victorian, South Australian (SA) and Tasmanian state governments reviewed their moratoria on GM crops. The NSW, Victorian and Tasmanian governments established independent review committees to receive public submissions and review evidence. In SA, submissions were referred to the existing *GM Crop Advisory Committee* for its independent assessment. The reviews all focused on market and trade issues as assessment of health and environmental impacts of a GM crops are the responsibility of the Office of the Gene Technology Regulator (OGTR). Final reports and recommendations were referred to the relevant Agriculture Minister.

The reports produced by the NSW, Victorian and SA committees found strong evidence that the introduction of GM canola would have minimal impact on market access or prices for the majority of Australian canola and therefore recommended the moratoria be lifted (with the exception of Kangaroo Island in SA).

The Tasmanian *Joint Select Committee* recommended that the ban on the commercial production of GM food crops in the state be extended and reviewed after five years.

The main recommendations from each state committee are listed below.

Victoria – The Review Panel recommended that the Victorian Government allow the moratorium on GM crops to expire.

NSW – The Review Panel recommended the NSW Government remove the moratorium orders on the cultivation of GM canola.

SA – The Review Panel recommended that the cultivation of GM canola in South Australia other than on Kangaroo Island be permitted following the expiration of the *Genetically Modified Crops Management (Designation of Areas) Regulations 2004* on 29 April 2008.

Tasmania – The *Joint Select Committee* recommended that the ban on the commercial production of GM food crops in the state be extended and reviewed after five years. The main reason for the recommendation was to allow Tasmania to stay "GMO free" in order to gain a market advantage. GM poppy field trials have continued in the state despite the moratorium.

As a result of Government responses to these Reviews, farmers were able to grow GM canola commercially for the first time in NSW and Victoria in 2008. However, the South Australian and Tasmanian Governments elected to extend their GM moratoria.

In Western Australia (WA), The *Genetically Modified Crops Free Area Act 2003* is in place, however, in 2008 two exemptions were granted. One was for the commercial cultivation of GM cotton in the Ord River Irrigation Areas and the other was for small scale commercial GM canola trials in the State.

The case of canola

According to the Australian Bureau of Agricultural and Resource Economics (ABARE), Canada dominates the world canola export trade, with a market share of 71 per cent in the three years to

2005-06. Australia, during the same period, satisfied 19 per cent of the export market. While 79 per cent of Canada's canola production is comprised of GM varieties, virtually all of the country's export canola is considered to be GM, because no segregation of GM and non-GM occurs. This did not stop its exports reaching record levels in 2006.

Japan is the main importer of GM canola, taking 42 per cent of the global imports in the three years to 2005-06. Further, in the traditional import markets for canola - Japan, Mexico, China, Pakistan and Bangladesh - GM canola is generally accepted as readily as conventional canola and is priced at very similar levels.

Whilst Canada did lose access to the European Union (EU) market for its canola seed, it found ready markets for its increased canola supplies elsewhere, and it continues to supply canola oil to the EU. Australia's advantage of being able to supply non-GM canola to the EU market is likely to disappear as further GM canola varieties are approved for import, as was the case recently. In March, 2007 three herbicide tolerant GM canola varieties were approved for import into the EU and use as animal feed or for industrial purposes.

In relation to the use of GM canola domestically, ABARE states that there is already wide use of products from GM crops in the domestic Australian market, particularly with domestically produced GM cottonseed and imported GM soybean products. ABARE estimates that less than 10 per cent of Australia's animal industries (pigs, poultry, dairy and feedlots) require only non-GM inputs to be used in feed compounds.

On price premiums

According to ABARE, there is "some very limited evidence of price premiums for organic and certified GM-free canola" however markets for these canola types are still very much small niches.

Comparisons between Australian and Canadian domestic prices have been used in the past to suggest that there is a growing price premium for Australia's non-GM canola in world markets. However, ABARE states that based on world import data, GM canola and non-GM canola are sold at very similar prices in the major canola markets across the globe.

ABARE concludes that, "The best prospect for the development of more widespread price premiums for non-GM canola is through the reduction in export availabilities of non-GM canola arising from the commercialisation of GM canola in Australia."

Unintended or adventitious presence

According to the Australian Seed Federation (ASF), the unintentional mixing of trace amounts of seed from one plant variety with another variety is commonly referred to as 'adventitious presence' (AP) or 'unintended presence' (UP). Adventitious presence has economic implications in relation to market access, contract specifications and consumer preferences.

Unintended materials in an agricultural context includes things such as weed seeds, seeds from other crops, dirt, rodent faeces, insects or foreign materials such as stones, bits of wood or plastic. Thresholds for AP are an everyday reality in agriculture. Low levels of varietal impurities are an inherent problem in seed and grain production, and this has clearly been recognised by industry groups and Australian and international regulatory authorities. As a result practical levels or thresholds have been developed for AP.

Thresholds set at the commodity level are designed to meet end-product requirements such as customer expectations or regulated labelling requirements. The Australian Seed Federation (ASF) has established a non-GM canola tolerance threshold for the adventitious presence of 0.5 per cent GM seed in non-GM planting seed.

A non-GM canola standard with an AP tolerance of 0.9 per cent (that is, equivalent to the European Union standard for AP) has been recommended by the Australian Oilseeds Federation in order to satisfy non-GM market opportunities.

The possibility of the unintended presence of GM canola jeopardising exports of commodities such as wheat and barley is not apparent when looking to other GM crop producing countries according to ABARE. For example, there is no evidence to suggest that GM canola content adversely affected Canada's barley or wheat export markets. It suggests that one reason for this is that Canada has strict standards for the unintended presence of small seeds in wheat (0.1 per cent) and barley (0.05 per cent).

One market seen by Australia's barley marketers as being particularly sensitive to any GM content was Saudi Arabia, the world's largest importer of feed barley. Since then, ABARE claims that Saudi Arabia seems to be "more accepting" of GM crops, accepting barley from the Canadian market.

Identity preservation

Identity preservation is defined by ABARE as "the process by which a crop is grown, handled, delivered and processed under controlled conditions to assure

the customer that the crop has maintained its unique identity from seed producer to end user.”

ABARE has developed a framework for estimating identity preservation costs and establishing who bears those costs in relation to the introduction of GM grain crops into Australia. The report concludes that while there will be costs involved in managing GM grains through the grain supply chain such costs appear “modest and manageable.”

In order to come up with specific figures, four case studies were utilised in the modelling process. The cost of identity preservation for non-GM canola ranged from an estimated \$331 a representative farm in one port, to \$1,119 in another zone. The costs vary according to factors such as seeding rates, the mix of grains produced, climate and the characteristics of the receival site.

On average, 85 per cent of these costs will be incurred on farm because of the need for:

- certified planting seed (guaranteeing that the unintended presence of GM materials does not exceed specified levels);
- various crop management techniques (including appropriate separation distances and control of ‘volunteer’ growth; and,
- cleaning after harvesting, handling, storing and transporting GM grain types.

The remainder of these costs may be incurred by bulk handlers and are related to:

- additional time taken switching between grains at receival sites; and,
- the possible requirement for testing for the presence of GM material.

The report states that “if the additional identity preservation costs are attributed to non-GM canola growers (because it is they who hope to benefit from price premiums), the estimated cost averages \$14.48 for each tonne of canola delivered, representing four to six per cent of the average farmgate price for canola in a typical year.”

The estimated unintended presence of GM canola in non-GM canola at the rail export point ranged from 0.31 per cent to 0.35 per cent assuming certified seed is used. These levels would not pose any export market issues for Australian canola. Further, the unintended presence of GM canola in other grains was estimated to be “almost negligible”.

Coexistence

According to the Council for Agriculture Science and Technology (CAST), coexistence at the farm level describes “farmers growing different types of crops

while recognising that AP will occur in each, adopting reasonable practices of good stewardship and husbandry to minimise AP, and working in a neighbourly fashion with adjoining farmers.”

Examples of conventional commodities that coexist, have AP thresholds and meet global market requirements include:

- malting barley and feed barley;
- corn varieties grown for food, feed and industrial use (starch); and,
- pasta wheats and bread wheats.

The ability for GM and non-GM crops to coexist in agriculture has also been the subject of a number of studies in recent years. The latest report commissioned by the EU concluded that coexistence is possible often with little or no additional effort by farmers depending on factors such as field sizes and the crop itself.

PG Economics has also released a number of reports looking at coexistence between GM and non-GM crops. According to a research paper looking at the North American experience:

- GM crops have been, and continue to coexist with conventional and organic crops in North America (where GM crops account for the majority of plantings of important arable crops like soybeans, oilseed rape and corn), without causing any economic or marketing problems to conventional or organic growers;
- claims by anti-GM groups that GM and conventional crops cannot coexist in North America are greatly exaggerated, given the on-farm experiences since 1995; and,
- the market has developed practical, proportionate and workable coexistence measures without government intervention. These have been delivering effective coexistence since GM crops were introduced.

Farmers in Australia and around the world have proven that they can, and do, deliver choice along supply chains to meet market demands and consumer needs. Now, Australian farmers are increasingly asking for the choice to implement the production method which best suits their business needs – be that GM, conventional or organic.

Global experiences

According to the latest statistics released by the International Service for the Acquisition of Agri-biotech Applications (ISAAA), GM crops were planted across 114.3 million hectares in 23 countries by 12 million farmers in 2007. This represents a 67-fold increase between 1996 and 2007. The United

States of America (USA) continues to dominate GM crop production followed by Argentina, Brazil, Canada, India, and China. The four dominant GM crops are soybean, corn, cotton and canola.

The EU is often used as a barometer of GM food and crop acceptance, so it is worth noting that in 2007, eight EU countries grew GM corn varieties – Spain, France, Czech Republic, Portugal, Germany, Slovakia, Romania and Poland. This follows the lifting of the de-facto moratorium in 2003 and GM food and feed approvals once again moving slowly through the regulatory process.

According to PG Economics, GM crops have resulted in net economic benefits at the farm level amounting to US\$27 billion since their introduction in 1996. This is coupled with environmental benefits such as a reduction of pesticide use equivalent to a 15.5 per cent reduction of the associated environmental impact and significant reductions in the release of greenhouse gas emissions from agriculture through reduced pesticide use and changed soil cultivation practices.

Despite perceptions of consumer resistance and market access difficulties, GM producing countries dominate world trade in soybeans, corn, cotton and canola.

Further information

'Brief 37' (2007). International Service for the Acquisition of Agri-Biotech Applications (ISAAA). www.isaaa.org/resources/publications/briefs/37/executivesummary/default.html

'Co-existence in North American agriculture: can GM crops be grown with conventional and organic crops?'. 2004. PG Economics. www.pgeconomics.co.uk/pdf/CoexistencereportNAmericafinalJune2004.pdf

'Genetically modified crops management Act - review of the genetically modified crop advisory committee'. 2007. South Australian Government. www.pir.sa.gov.au/gmc

'Gene technology (GM crop moratorium act 2003 review – independent panel report for the NSW minister for primary industries'. 2007. NSW Government. www.dpi.nsw.gov.au/agriculture/field/oilseeds/canola/gm/review/qa-on-gm-moratorium-decision

'GM crops: the first ten years - global socio-economic and environmental impacts'. 2006. PG Economics. www.pgeconomics.co.uk/pdf/global_impactstudy_2006_v1_finalPGEconomics.pdf

'GM grains in Australia: identity preservation'. 2006. ABARE. www.abareconomics.com/publications_html/crops/crops_06/GM_grains.pdf

'Market acceptance of GM canola'. 2007. ABARE. www.abareconomics.com/publications_html/crops/crops_07/GM_Canola.pdf

'New case studies on the co-existence of GM and non-GM crops in European agriculture'. 2006. European Commission Joint Research Centre. www.jrc.es/publications/pub.cfm?id=1345

'Review of the moratorium on genetically modified canola in Victoria'. 2007. Victorian Government. [www.dpi.vic.gov.au/DPI/nrenfa.nsf/9e58661e880ba9e44a256c640023eb2e/e28ce4017e7dcfe7ca2573a70016df9e/\\$FILE/Panel%20Report%20to%20the%20Minister%20for%20Agriculture,%20October%202007.pdf](http://www.dpi.vic.gov.au/DPI/nrenfa.nsf/9e58661e880ba9e44a256c640023eb2e/e28ce4017e7dcfe7ca2573a70016df9e/$FILE/Panel%20Report%20to%20the%20Minister%20for%20Agriculture,%20October%202007.pdf)