

## **Submission to Agriculture and Food Policy Reference Group**

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The issues paper on 'Ensuring a profitable and sustainable agriculture and food sector in Australia' presents a number of challenges facing Australian governments' agricultural producers, marketers, scientists and consumers now and in the future.

We have focussed our submission on the benefits arising from the continued adoption of Biotechnology to Australian agriculture and food sector and a way forward for the testing of the coexistence of parallel GM and non- GM grains supply chains.

In a recent paper presented to the 9<sup>th</sup> Conference on Agricultural Biotechnology hosted by the International Consortium on Agricultural Biotechnology Research ([www.economia.uniroma2.it/conferenze/icabr2005/papers/Tribe\\_Davi\\_Kalla\\_Roger.pdf](http://www.economia.uniroma2.it/conferenze/icabr2005/papers/Tribe_Davi_Kalla_Roger.pdf)) we described the results of an analysis of the economic and environmental impact of genetically modified insect resistant cotton in Australia.

The paper outlines the factors that have contributed to the rapid adoption of GM cotton in the well integrated cotton supply chain. The conversion to insect resistant GM cotton in Australia has provided direct economic benefits while at the same time reduced use of pesticide with concomitant reduction in yield losses in yield. Put in another way the land sown to cotton in Australia is now more productive giving a raised output with less input. The adoption of GM cotton has also ensured the competitiveness of Australian cotton growers against GM cotton producers in India, China, Mexico and USA as evidenced in a recent report from ABARE on Market issues for GM crops where Australia's share of cotton exports over the five years from 1999 to 2003 represented 37 % of world export while Australia produced less than 3% of world cotton seed (Market Access Issues for Genetically Modified Products: Implications for Australia, [abareonlineshop.com/product.asp?prodid=12559](http://abareonlineshop.com/product.asp?prodid=12559)).

Innovation in Australia's first fibre, food and feed crop continues unabated and in addition to input traits now output traits with direct health benefits to the consumer are being evaluated in small scale field trials (DIR 039/2003 - Field Evaluation of Genetically Modified High Oleic (HO) Cotton, [www.ogtr.gov.au](http://www.ogtr.gov.au)).

The main concern raised by participants in the canola and cereal grains supply chain against full scale commercial production of GM canola the second GM food and feed crop that has received federal regulatory approval (DIR 021/2002 - Commercial release of InVigor® hybrid canola (*Brassica napus*) for use in the Australian cropping system and DIR 020/2002 - General release of Roundup Ready® canola in Australia, [www.ogtr.gov.au](http://www.ogtr.gov.au)) has been the perceived threat against the international marketing advantage of the projected 'GM free' status for Australian grain producers.

The media prominence given to these marketing concerns about GM crops have tended to obscure a major economic risk faced by Australian primary agricultural

exporters if 'GM-free' perceptions continue to delay biotech crop innovation in Australia: the likely serious future erosion of Australia's market competitiveness due to widespread adoption by Australia's export competitors Argentina, Brazil, Canada, and the USA of cost-saving GM seeds or transgenic nutritionally enhanced commodities (e.g. omega-3 oils). Currently these trade competitors show little evidence of delaying innovation or discouraging investment in biotech crop varieties. Policy proposals that minimise this potential trade damage are an urgent priority.

The notion that Australia could protect the image of its agriculture and food export sector as being 100 % GM free (in spite of rapidly having converted to GM cotton which constituted 80% of last year cotton harvest) by delaying the introduction of GM canola has been challenged by the recent finding of minuscule amounts of a strain of GM canola mixed up in an export consignment of conventional canola and detected by sensitive forensic DNA analysis technology. The origin of this approved, but obsolete, GM strain is under investigation by the Victorian Department of Primary Industries.

The modern breeding of novel types of canola and cereal grains is a global pursuit with novel genes ( derived using GM or non GM technologies in molecular breeding research centres all over the world ) being crossed into plants that are well adapted to the local growth conditions in collaborative research programs between private and publicly funded agricultural R & D organisations. Often these programs take advantage of the counter seasons with seeds being multiplied and evaluated on both sides of the globe and frequently exchanged before commercialisation in any one country.

There are previous examples of human error creeping into this interconnected system. A GM canola strain, mislabelled as of non-GM origin, was delivered by an overseas private seed company for evaluation in the field to the Victorian Department of Primary Industries in 2003. However, this case of mistaken identity was detected before the GM canola plants had flowered and the plants were destroyed. The incident was investigated by OGTR without any action and reported on its web site ([www.ogtr.gov.au/rtf/public/sept2003qrpt.rtf](http://www.ogtr.gov.au/rtf/public/sept2003qrpt.rtf)).

We would argue that the benefits to Australian agriculture and food industries and the consumers of Australian research organisation continuing to take part in global technology diffusion far outweighs the perceived risks to our export markets by the tarnishing of a projected 'GM free' image due to such mix ups.

It is in the interest of private and public research organisations to carefully manage these risks due to real issues with IP management. Such incidences, if carefully monitored, certainly doesn't warrant that we pull out of all work with overseas research organisations nor that Australia unilaterally ban all imports of any grains from North America due to the perceived risk of 'contamination' of the Australian 'GM free' image as has been suggested by some groups ideologically opposed to GM crops.

Likewise it is unreasonable to expect that parallel GM and non- GM canola and cereal grains supply chains could guarantee 100 % purity of bulk shipment of either type of canola.

We see a role for the Australian Government in partnership with companies involved in the providing services in the grains supply chain and State Governments to

determine what are tolerable levels of admixture of GM canola in any type of exported grain. The Australian position needs to be underpinned by scientific and economic analysis of cost vs. benefit of the testing regimes that are required to adequately address the cut –off criteria.

It is worth noting that forensic DNA testing is technically challenging and costly (in the order of \$ 100 -250 per sample analysed if done in-house). There are also issues with standardisation of sampling protocols of bulk consignments seed for presence of GM canola seed along the supply chain.

If it was decided that Australian exports grain shipments required to be DNA tested to meet internal or external market requirements there would be a potential role for Government in advising and accrediting research organisations involved in such analysis.

The EC Directorate General Joint Research Centre, within the Institute for Health and Consumer Protection, has got a dedicated Community Reference Laboratory (CRL) for GM food and Feed. The CRL develops tests for GM crops and evaluates their efficacy. A recent example is the standardised test it developed for the Bt 10 maize strain (<http://gmo-crl.jrc.it/detectionmethods/Bt10%20Detection%20Protocol.pdf>).

We believe that a thorough test of the capability of the grains supply chain to keep GM canola apart from non-GM canola is required. An approach to a trial of coexistence using the GM canola strains that had received regulatory approval was originally suggested by the Australian Oilseeds Federation in submissions to a number of State Governments in the beginning of 2003. We would suggest that the original proposal could be augmented by the establishment of independent testing authority modelled on the EC Community reference laboratory for GM food and feed.

There are companies involved in DNA testing of food and feed in Australia ([www.agriquality.co.nz/horticulture/agriquality\\_gmo\\_services.cfm](http://www.agriquality.co.nz/horticulture/agriquality_gmo_services.cfm)). Other major grain marketing organisation, including AWB, has decided to join groupings such as the Global Laboratory Alliance (GLA) which is supported by large US DNA testing companies such as Genetic ID. Genetic ID has recently also developed a test to Bt10 maize that is legally recognized by the EU ([www.genetic-id.com/pr/bt10\\_test.pdf](http://www.genetic-id.com/pr/bt10_test.pdf)) and aligned with the CRL protocol.

The State moratoria on GM canola and other GM novel crops are only a holding pattern and proactive leadership from the Federal Government is required in order for Australia to continue to benefit from the world leading agricultural biotechnology research and development undertaken by Australian public and private research organizations.

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SUMMARY OF COMMENTS AND RECOMMENDATIONS:

1) BENEFITS OF GM COTTON TO AGRICULTURE AND END CONSUMERS NOW AND IN THE FUTURE

- Our paper outlines the large economic and environmental benefits that insect resistant BT cotton, the first Australian GM fibre, food and feed crop, has provided until now.
- The direct benefits to end consumers of GM cottonseed with modified oil content will be realised with High Oleic GM cotton strains being evaluated in the field.

2) GM CANOLA AND THE BLOCKAGE TO ITS COMMERCIALISATION

- The present blockage to the commercialization of GM canola, the second Australian GM food and feed crop is unsustainable.
- The projected 'GM free' image of Australian agriculture and food export sector based on the State moratoria on GM canola is misleading and doesn't acknowledge the realities of the globally integrated efforts in the development of novel strains of major food and feed crops such as cotton and canola.

3) FEDERAL GOVERNMENT NEEDS TO TAKE A LEADERSHIP ROLE IN DEVELOPING A ROAD MAP PAST THE MORATORIA SPEED HUMPS

- Revamped Coexistence trials to evaluate the capacity for segregation along the grains supply chain needs to be undertaken by agriculture and food industry sector organizations and facilitated by Federal Government.
- Standardized DNA testing protocols based on scientific and economically sound cut-off levels for admixture of GM crops in non-GM canola and grain bulk consignments overseen by independent national authority like the EU Community Reference Laboratory (CRL) for GM food and Feed.
- In order for Australian agriculture and food sector to continue to be competitive in overseas markets Federal government needs to take a more proactive role in ensuring that Australian world class research and development efforts in these sectors converts good ideas and smart work to solutions that will benefit Australian rural communities, economy and end consumers.

Attached: Abstract to paper by Tribe and Kalla submitted and published by ICABR July 2005.

**9th International Conference on  
Agricultural Biotechnology: Ten Years After**

organized by the:

**International Consortium on Agricultural Biotechnology  
Research (ICABR)**

and the:

**Catholic University of Leuven CEIS - University of Rome "Tor Vergata" Center of  
Sustainable Resource Development, University of California at Berkeley Economic  
Growth Center, Yale University**

**Ravello (Italy), July 6-10, 2005**

**“Economic Impacts of Two Genetically Modified Crops in  
Australia”**

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**ABSTRACT**

Currently in Australia, two genetically modified (GM) crops – canola and cotton – have passed through formal regulatory scrutiny of their health and environmental impacts, but the two have achieved very different market place results.

Insect-resistant (Bt) cotton has been grown in Australia since 1996, and the Australian GM cotton industry was essentially self-regulating until the introduction of a national regulatory framework for agricultural biotechnology by Federal and State Governments in 2001.

The very successful uptake in Australia of Bt cotton has been attributed to a strategically well organized partnership between the local cotton industry, GM technology providers, public research bodies and farmers. Scientifically important factors have been an effective Bt resistant insect management strategy that mandates refuges, and the introduction of stacked two-gene Bt-cotton in 2004. GM technologies have been credited as the savior of an industry under threat from pests, and with transforming the industry into a sustainable and profitable export income earner.

The Australian canola industry is still developing but has suffered some recent setbacks not experienced by the cotton industry. Public research bodies have developed disease resistant cultivars of Australian canola grade oilseed rape over the last 15 years. More recently herbicide tolerant GM canola varieties have been bred and evaluated in small scale field trials. Canola is now grown in crop rotations with wheat, the major Australia export grain. Although herbicide tolerant GM canola may fit well agronomically with this rotation, wheat exporters have been slow to endorse GM canola, and have rejected outright drought-resistant and salinity-tolerant GM wheat varieties presently under development in Mexico and Australia.

Insect resistant Bt cotton last year comprised 80 % (250,000 ha) of the area sown to cotton and earned Australia the reputation of being a Biotech crop ‘Mega-country’ (ISAAA Brief No. 32-2004). However, herbicide tolerant GM canola that received regulatory approval for commercial release by the Federal regulator in 2003 has been blocked from commercial planting. State Governments which have the final say on commercialization of GM crops remain concerned about possible economic impacts of proposals for stepwise adoption of GM canola.

Australia is leading the way in the research and development of second and third generation GM oil crops. Some of the novel Australian GM oilseed crops, incorporating new traits with direct health benefit to the consumers, are being evaluated in small contained field trials at present. If a clear route- to-market for these crops existed it is very likely that they would attract increased foreign investments into Australian agriculture. However, the present block to commercialization of the major GM oilseed crop in Australia, namely canola, has dried up investments into the Australian canola industry and has had the effect of shifting the domestic investment focus away from the temperate regions of Australia to domestic GM cotton grown in the sub-tropical parts of Australia or overseas to countries that have successfully adopted GM soybeans.

A major factor causing the blocks to commercialization of GM canola has been different and often conflicting judgments by different stakeholders of the claimed export marketing advantages of an Australian “GM-free stance”, particularly as far as marketing benefits for other agricultural exports such as wheat and dairy produce. In Australia though, GM cottonseed feed is freely traded and GM soy-meal animal feed freely imported belying any state claim to a “GM-free stance”.

Different member States of the Australian Federation and the Federal Government have made substantially different legislative decisions on these issues, and different voter constituencies (inner city versus rural) provide opposing inputs to political decisions. Unlike the cotton industry, a coherent strategy and process has yet to be established for the Australian grains industry to achieve timely commercialization and investment certainty with GM grain crops.