



## Biotech Bulletin 15

# Adventitious Presence

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Welcome to this edition of Agrifood Awareness Australia Limited's (AFAA) Biotech Bulletin.

Over the past month the grains industry has confirmed the detection of small quantities of genetically modified (GM) canola growing in Australia. Genetically modified canola varieties have been approved by Australia's federal regulator for commercial production, however state-based bans have prevented the commercial release of these varieties for use by Australian grain growers. The discovery of small quantities of GM canola, not allowed under state government legislation, has created a dilemma for Australia's state and federal policy makers (\*for background on the Australian GM canola situation see page 3).

This Biotech Bulletin examines the issue of adventitious presence (AP) thresholds and notes that agriculture worldwide has relied on practical thresholds. The establishment of such thresholds is critical if Australian farmers are to continue as leaders in the adoption of agricultural innovation.

### WHAT IS AP?

According to the Australian Seed Federation (ASF), the unintentional mixing of trace amounts of seed of one plant variety with another variety is commonly referred to as 'adventitious presence' (AP) or 'unintended presence' (UP). 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.

In relation to approved GM crops, such as the two canola varieties in Australia, their presence in conventional or organic production is not a food safety, environmental or human health issue because they have been approved by Government agencies, in Australia and in other countries, on these grounds. The issue of AP in this case concerns economic impacts - market access, contract specifications and consumer preferences.

### WHY DEVELOP AP THRESHOLDS?

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. Seed standards and tolerances, and seed production processes that minimise low levels of impurities, have been implemented to keep AP levels to a realistic and acceptable level in many different commodities, including grains.

During the growing season, external inputs interact with the crop and also reduce its purity. These inputs include weeds and other crops and can be carried by the wind, water, bees, machinery and other equipment. By implementing sound on-farm management practices, growers can, and have, kept AP levels within the required threshold. Management practices might include buffer zones and isolation distances and hygiene standards for cleaning processing machinery, transport equipment and storage facilities.

Generally, if AP is too high in a particular crop, the grower accepts a reduced price. Thresholds for AP become costly and more difficult in relation to compliance the lower they are set. It is for this reason that farmers growing specialty crops with such thresholds generally expect a greater return for their product.

Thresholds set at the commodity level are designed to meet end-product requirements such as customer expectations or regulated labelling requirements. For example, the European Union (EU) requires labelling of a food product as GM or containing GM ingredients if it contains more than 0.9 per cent GM content. This is the lowest threshold in the world in relation to GM content in food products.

## AUSTRALIAN INDUSTRY STANDARDS

Two key Australian agricultural organisations have established industry standards in relation to AP thresholds for GM canola, as follows:

The **Australian Seed Federation (ASF)** is the peak seed organisation in Australia. It represents the interests of its members involved in the breeding, production and marketing of sowing seed - at state, national and international level. In 2003, following two years of research and consultation with the canola seed industry, the ASF established via its national Code of Practice for Seed Labelling & Marketing, a non-GM canola tolerance threshold for the adventitious presence of 0.5 per cent GM seed in non-GM planting seed.

The ASF states, "The combination of sound crop management practices particularly relating to crop isolation or buffer zones and seed handling hygiene will provide a basis for Australian canola seed growers to meet the current market and regulatory non-GM requirements for seed production."

The **Australian Oilseeds Federation (AOF)** represents the common interests of all Australian oilseed industry participants and promotes the development, expansion and improvement of Australian oilseed production. Growers involved in the production of canola, cottonseed, soybeans and sunflower, as well as the minor oilseeds safflower and linseed are represented by the AOF.

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 AOF in order to satisfy non-GM market opportunities. The AOF also believes that sound crop management practices provide a basis for Australian growers to meet the current market and regulatory non-GM requirements.

The AOF noted in its submission to the OGTR Act Review that it "encourages state and Federal Governments to take leadership in this area and work together to provide a consistent approach nationally to economic and trade issues, including the establishment of tolerances and thresholds so that the industry can operate in a clearly defined, consistent and science-based system."

In Australia, the industry body responsible for establishing industry standards is **NACMA, the National Agricultural Commodity Marketing Association**. NACMA develops and publishes grain standards to ensure objectivity in grain specification. The standards are updated yearly and are accepted as the industry's standard reference. NACMA has also released Codes of Practice relating to the storage and transport of basic commodities and basic value added products. These Codes are published in conjunction with Australian Oilseeds Federation (AOF).

NACMA has established tolerances for the presence of canola in other grain commodities. For example, under the Australian grains wheat receival standards as published by NACMA a threshold ranging between 0.6 and 1.2 per cent exists for the presence of small foreign seed contaminants, which includes canola, in wheat. The threshold range depends on the particular wheat variety, with feed varieties having a higher threshold for such seed contaminants. As yet, a standard for GM canola, or the presence of GM canola in non-GM canola or other commodities has yet to be established.

## AP AND 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)
- Pasta wheats and bread wheats

Under Australian standards as set by NACMA, for example, a malt barley has to be segregated and from the current harvest to meet market requirements, whilst this is not specified for feed barley. Similarly, Prime Milling Oats are not allowed to contain other oat varieties whilst feed oats can.

In relation to organic production, the International Federation of Organic Agricultural Movements (IFOAM) states "IFOAM accepts the reality that organic producers operate in the real world and cannot be completely isolated from environmental pollution or the effects of global development. Therefore it is IFOAM's position that we need to find a realistic balance between the rejection of GE in organic production and the practicalities of avoiding a distant link between organic production and genetic engineering."

Further, IFOAM states in its position statement on GMOs, "Organic certification shall not imply 'GE-free' certification. Rather it shall be presented as guaranteeing 'production without GE/GMOs.' As there is no guarantee that organic products are 100 per cent free from any GMO pollution, organic products shall not be marketed as 'GE-free', unless there are specific safeguards in place and certification procedures for that specific product. Organic producers and associations shall actively inform the consumers to this fact to ensure fair marketing claims and to avoid future debates about consumer deception."

In two countries where GM crops are widespread - the USA and Canada, there is no evidence according to CAST to suggest any organic farmer has lost their organic certification because of AP of GM material. The United States Department of Agriculture and the Saskatchewan Queen's Bench Court in Canada have concluded this in their jurisdictions.

## **IN CONCLUSION**

Eighty-one million hectares of GM soybean, corn, cotton and canola were grown around the world in 2004. This has increased almost 50-fold since 1996, and these crops were grown by 8.25 million farmers in 17 countries. They would not be grown if they did not perform or they did not have markets. Australia has had incredible success with GM cotton varieties, which now represent 80 per cent of the cotton area in Australia. CSIRO scientists are predicting pesticide reductions of up to 75 per cent with these varieties in the near future – with the industry already more than halving pesticide use since 1996.

State Governments have banned GM canola in their jurisdictions and allowed GM cotton production to continue. They have done this by classing cotton as a non-food commodity and canola as a food commodity. Cottonseed oil from GM cotton is used in food production in Australia, as oil from GM canola would be. Further, GM carnations are grown and sold in Australia; GM soy and corn have been imported for animal feed; and, FSANZ has approved 26 GM products as safe to eat and these are able to be legally sold in Australian supermarkets.

With Canada's GM canola traded around the world, and Australia's federal regulator, the OGTR, having declared two GM canola varieties "as safe to humans and the environment as conventional (non-GM) canola", it seems logical AP thresholds should be established. The establishment of practical AP thresholds, such as those established by the Australian seed and oilseed industries will allow farmers with small quantities of GM canola on their properties to produce a crop that meets global market specifications.

Thresholds relating to GM content need to be recognised and accepted by all government and industry. If no thresholds exist, then zero tolerance is the expectation. A zero tolerance imposes an impossible and unnecessary standard on Australian farmers and producers, and could herald the end of research and development trials impacting both conventional and gene technology breeding programs, and Australia's capacity to embrace innovation.

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## **\* BACKGROUND**

**Canola in Australia** - Canola is one of the most important winter grain crops grown in Australia, and in 2003 it had a four-year gross value of production of \$596 million, even with the drought affected season of 2002-2003. Canola is not only a valuable crop itself, it acts as a disease break for crops grown after it in rotation. Break crops such as canola reduce the incidence and severity of fungal diseases in subsequent wheat crops resulting in higher yields and quality. Research in Australia has found that wheat following canola has a 20 per cent yield benefit over wheat

following wheat. It is also worth noting that Australian farmers grow two conventionally-bred herbicide tolerant varieties.

**GM canola commercial approvals** - In 2003, two GM herbicide tolerant varieties of canola developed by Monsanto Australia and Bayer CropScience were approved for commercial cultivation in Australia after six years of field trials and regulatory evaluation. The Office of the Gene Technology Regulator (OGTR) found the herbicide tolerant GM canola varieties to be "as safe to humans and the environment as conventional (non-GM) canola." Australia's food regulator, Food Standards Australia New Zealand (FSANZ), has also approved the two GM canola varieties as safe for human consumption.

**State moratoria** - Despite these approvals at the Commonwealth level, Australian canola growing states imposed bans to prevent the commercial cultivation of the GM canola varieties, claiming concerns related to the impact on current markets for Australian grain. Most of these bans are in place until 2008. These bans were implemented despite the following facts:

1. Both varieties are approved for cultivation, production and food use in Japan, Canada and the United States of America. China also accepts GM canola imports. The European Union, an opportunistic market for Australian and Canadian canola, is the only market that stopped taking imports of GM canola from Canada in 1995, however it has since implemented new GM legislation and is once again approving GM products.
2. A number of independent reviews by industry and state governments relating to the impact of introducing GM canola confirmed that the introduction of GM canola would have no significant impact on Australia's ability to export its grain products to current export markets.

**Grains industry protocols** - During the development of GM canola in Australia, the Australian grains industry supply chain collaborated and developed coexistence protocols to ensure choice in relation to the production of GM, conventional or specialty canola. The protocols consisted of pre-, on- and post-farm components.

Following the OGTR approval of GM canola varieties and the development of coexistence protocols, a proposal was developed in 2004 to undertake trials to demonstrate the protocols, however permission by state governments was not granted.

Monsanto Australia has subsequently withdrawn from all canola breeding program activities in Australia. Bayer CropScience is only involved in a small-scale GM canola research and development program in Victoria and South Australia with trials permitted and overseen by the respective State Governments.

**Detection of GM canola** - In July 2005, the presence of GM canola was detected in routine testing by ABB Grain Limited in a consignment of canola from Victoria. The level of GM content was reported as 0.01 per cent. This detection level is ten times below the reportable level of 0.1 per cent utilised by the international GMO testing community, and one hundred times below the level required for food labelling for GM content in Australia (one per cent). Australia's major grain marketers have indicated that finding this GM content should not alter their ability to meet international customer requirements.

More recently, conventional canola trials planted across Australia as part of National Variety Trials (NVT) have tested positive for the presence of traces of Monsanto's GM herbicide tolerant canola. The National Variety Trials are an initiative funded by the Grains Research and Development Corporation (GRDC). The objective of the NVT system is "to provide growers and their advisers with independent information on the performance of newly released varieties of winter field crops, relative to the current commercial varieties grown in their area. The intention is to have two years of data available at the time each new variety is made available for commercial production."

**GM canola under Australia's moratoria** – Under state government moratoria legislation, it is illegal to cultivate GM canola in Australia. Further, the moratoria legislation has a zero threshold for GM canola, that is, a nil tolerance. This situation has created a major conundrum for policy makers. While many state politicians have indicated that they will not prosecute farmers who have GM canola growing on their properties as a result of these incidents (because they unknowingly cultivated it) policy makers must now decide on the way forward. Their options include maintaining a zero threshold and destroying all crops with GM content, treating the current crops with GM content as GM trials, or implementing a practical AP threshold.

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