

## **QUESTIONS & ANSWERS ON DECISION ON LICENCE APPLICATION DIR 057/2004: BAYER CROPSCIENCE PTY LTD'S GENETICALLY MODIFIED INDIAN MUSTARD**

Bayer CropScience Pty Ltd (Bayer) submitted an application to undertake a field trial of genetically modified (GM) herbicide tolerant hybrid Indian mustard (*Brassica juncea*) under limited and controlled conditions in September 2004. The Gene Technology Regulator issued a licence for the release on 2 June 2005.

### **When and where can the release occur?**

The trial may be conducted at four sites, on a maximum area of four hectares per site, during each of the winter and summer growing seasons of 2005-2008, in up to 17 shires in New South Wales, South Australia and Victoria. The total maximum area permitted over the six growing seasons is 96 hectares.

### **What is the purpose of the release?**

The trial involves early stage research that aims to evaluate the agronomic performance of up to 70 different GM Indian mustard lines, including comparison with conventional Indian mustard and GM and conventional canola (*B. napus*), to assess the effectiveness of the herbicide tolerance trait in the field, and to produce seed from lines selected for ongoing evaluation (subject to further approvals).

### **What is *Brassica juncea* and what is it used for?**

*Brassica juncea*, commonly known as Indian, Oriental or Brown Mustard, is cultivated worldwide as a vegetable, condiment and for oilseed. In Australia, Indian mustard (*B. juncea*) has been grown for condiment and oil purposes and as a break crop to wheat for the past 25 years and occupies several thousand hectares of agricultural land. The centres of production are in western Victoria and central New South Wales

Conventional breeding programs are developing 'canola quality' cultivars (i.e. high oil content and low erucic acid and glucosinolate levels). There is interest in growing canola quality Indian mustard as an alternative crop to canola, particularly in agricultural areas with low or inconsistent rainfall, due to Indian mustard's greater tolerance of heat and water stress, lower seed pod shatter, and superior yield enhancement in wheat rotation crops in some circumstances due to stronger suppression of cereal root pathogens (soil biofumigation).

### **What is the relationship between Indian mustard and canola?**

Indian mustard (*B. juncea*) is considered to have originated by hybridisation between turnip (*B. rapa*, formerly known as *B. campestris*) and black mustard (*B. nigra*). Canola (*B. napus*) originated by hybridisation between *B. rapa* and *B. oleracea* (cabbage, broccoli, cauliflower). Hence canola and Indian mustard are closely related botanically and grow in a similar way. All of these species belong to the *Brassicaceae* family (formerly Cruciferae) and may cross pollinate with each other and other related *Brassica* species. However, not all progeny are viable and genetically stable. The Risk Assessment and Risk Management Plan (RARMP) prepared in relation to DIR 057/2004 imposes licence conditions to limit the possibility of outcrossing (see below).

### **How has the GM Indian mustard been modified and what is the effect?**

The GM Indian mustard incorporates Bayer's hybrid breeding system (also present in InVigor® canola) that emulates the natural phenomenon of hybrid vigour. It also contains a gene that confers tolerance to a particular herbicide. This would enable the herbicide to be

applied to control weeds in the crop without affecting the GM plants. The genetic modifications are explained in greater detail in Appendix 1 of the RARMP.

**Is this the first release of this GM Indian mustard?**

Yes. However, the same genetic modifications were introduced into a GM canola that is currently being trialled under Licence No. DIR 032/2002. Two field trials of similar GM Indian mustard were also authorised under the former voluntary system overseen by the Genetic Manipulation Advisory Committee (GMAC).

**Will any of the Indian mustard from this trial be used for human food?**

No. None of the GM Indian mustard, conventional Indian mustard, or GM and conventional canola plants, or any by-products from the release would be permitted to be used in human food. Approval from Food Standards Australia New Zealand would be required before any material from the GM mustard could be used for this purpose.

**Have controls been imposed on this release?**

Yes. The licence conditions include a range of control measures that will restrict the direct exposure of people, animals and other organisms to the GM Indian mustard and GM canolas (if grown), and the spread of GMOs from the trial site e.g. limitation on the scale and duration of the trial, destruction of GM material not required for further research, harvesting and transport conditions. Other measures are primarily designed to limit the transfer of the introduced genes to related plant species and persistence of the GMO at the trial site eg. imposing monitoring and isolation zones, insect proof cages/tents, pollen trap, and post-harvest site management to remove regrowth. Full details of the licence conditions are set out in the final version of the Risk Assessment and Risk Management Plan (RARMP) that was prepared for this application and formed the basis of the Regulator's decision to issue this licence.

The complete document, which also includes a summary of the submissions received through the consultation process with expert groups and the public, and an Executive Summary, are available on the OGTR website ([www.ogtr.gov.au](http://www.ogtr.gov.au) under 'What's New?') or via Freecall 1800 181 030.

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