

Resistance warning given for GM herbicide-tolerant crops



GM canola in Australia will need to be grown under particular protocols to limit the development of herbicide-resistant weeds. Carl Davies, CSIRO Plant Industry

The Cooperative Research Centre for Australian Weed Management (Weeds CRC) recently cautioned that Australia must observe Canada's approach to integrated weed management if it is to introduce herbicide-tolerant crops and manage them in a way that does not increase the risk of herbicide-resistant weeds.

The warning comes as Victoria and New South Wales lifted their moratoria on GM canola late last year and other states review their rules on GM crops.

Leading herbicide expert Dr Chris Preston, of the Weeds CRC and the University of Adelaide, believes the introduction of GM herbicide-tolerant crops can provide real benefits to agriculture, but there are clear lessons from the Canadian and US experience that Australia must not ignore.

Speaking at an awards dinner for the CRC's research achievements, Dr Preston highlighted that glyphosate-resistant weed problems are on the increase in the US due to the reliance on Roundup Ready® cropping systems. 'Since the introduction of GM herbicide-tolerant crops in the mid 1990s, glyphosate resistance has occurred in eight weed species,' he said.

Canadian farmers, on the other hand, are smiling. GM herbicide-tolerant crops were introduced in 1996, yet glyphosate resistance is yet to emerge. The difference is 'integrated weed management'.

'Herbicide resistance in Canada has

been kept at bay through effective rotations of both crops and herbicides used in their farming systems,' said Dr Preston.

'In Canada, there are three GM herbicide-tolerant canola types and only one is glyphosate-tolerant.

'Contrast this with the United States where 91 per cent of the soybeans, 70 per cent of the cotton and 52 per cent of the corn are Roundup Ready®.

'The chance of resistance developing is far lower in Canada where both crops and herbicides are rotated and glyphosate is used less intensively.'

In fact, adds Dr Preston, Canadian farmers have used glyphosate-tolerant canola strategically to manage other herbicide-resistant weeds and to reduce the weed seedbank in the soil. They employ other methods to maintain effective weed control in subsequent years.

This dramatically reduces the pressure on weeds developing resistance, and illustrates how GM herbicide-tolerant crops might be deployed in Australian farming systems to break weed cycles if they are introduced here.

'Australia is in an enviable position to use the experience of other countries to inform how GM herbicide-tolerant crops should be managed,' Dr Preston said.

The discovery earlier this year of Australia's second glyphosate-resistant weed – awnless barnyard grass (*Echinochloa colona*) – highlights the importance of managing glyphosate use.

'Awareness is the key,' said Dr Preston. 'We can follow the Canadian experience or go down the path that the US has, but we cannot say we have not been warned.'

'In Australia, we have successfully introduced Roundup Ready® cotton, and last year Liberty Link® cotton, with farmers following integrated weed management plans. We need the same attention to integrated weed management with herbicide-tolerant canola.'

The Weeds CRC provides Australian farmers with the tools and advice for effectively managing herbicide-resistant weeds with their manual, *Integrated Weed Management in Australian Cropping Systems*, launched last year.

'Adopting a strategy that combines chemical and non-chemical tactics for weed control will be even more important for the long-term sustainability of Australia's cropping systems if GM herbicide-tolerant crops are introduced.'

Adapted from text by the Weeds CRC.

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More information:

Integrated Weed Management manual:
www.weeds.crc.org.au/publications/iwm_manual_flyer.html

About glyphosate resistance (Glyphosate Sustainability Working Group):
www.weeds.crc.org.au/glyphosate/index.html