

Bollgard II gets the nod

By Donald Turner, Cottonworld

Growers seeking further savings in pesticide use with Bollgard II cotton won't be disappointed, judging by results from 13 Australian trial sites — although red tape delayed approval of 2002 plantings and left seed companies in a sweat.

The Office of the Gene Technology Regulator (OGTR) announced its approval for the limited commercial release of Bollgard II following a comprehensive scientific assessment and public consultation process.

The OGTR has approved the commercial release of Bollgard II in the established cotton growing regions of Queensland and New South Wales (south of 22 degrees south) and the limited and controlled release in northern Australia.

The limitations in northern areas relate to continuing concerns about the ability of GM cotton to pose a weed problem in those areas. The OGTR licence allows up to 20 trials to take place in northern areas, with no site larger than 200 hectares. The total area planted to Bollgard II in the north will not exceed 800 hectares at any one time.

Monsanto Australia's Cotton Business Manager, Roger Boyce, explained that there was a clear reason for the two-part approval.

"The OGTR has talked extensively about limited, as opposed to commercial, release in northern Australia where cotton is only grown for trial purposes," he said.

"Monsanto's focus is the commercial cotton growing regions of Queensland and New South Wales where the OGTR has given approval for commercial release of Bollgard II."

The decision came with cotton planting already under way in Central Queensland.

Latest anti-GMO salvo

As the Gene Technology Regulator (Dr Sue Meek) considered her decision on Bollgard II, Britain's main certifier of organic food, the UK Soil Association, launched the latest anti-GMO salvo. In a recent report, it claims GM crops have not delivered promised benefits to US farmers and have resulted in loss of export markets for US crops.

Monsanto Australia spokesman Brian Arnst says the UK report does not correspond with figures showing a 15 per cent increase in GM acreage each year since 1996.

"There's a lot of reasons farmers are using these crops. They're more flexible and they believe they're better for



Approval has been granted for commercial release of Bollgard II in all major cotton growing regions.



Monsanto's Stewart Addison.



the environment," he says.

Roger Boyce says Monsanto aims to produce about 5000 hectares of Bollgard II in 2002–03 for seed increase and commercial evaluation, followed by 50,000 hectares in 2003–04. The plan is to remove Ingard from the market in 2004–05.

He says the staggered introduction of Bollgard II will allow breeders to address varietal concerns, ensuring the best agronomic traits are carried forward.

Bollgard II cotton produces two insecticidal proteins that are toxic to lepidopteran caterpillar pests — the cry1Ac and cry2Ab genes from the bacterium *Bacillus thuringiensis*.

Given the presence of two insecticidal genes, Bollgard II promises to increase insecticidal action relative to Ingard, as well as reducing the potential for insect pests to become resistant to the toxins.

Promising results

It is safe to assume pesticide use will be reduced relative to this increase in insecticidal action. And there is evidence of how effective the technology can be in Australian conditions.

Testing this past season of prospective Bollgard II lines compared them with conventional and Ingard cotton. Monsanto entomologist Stewart Addison and his team at Boggabri evaluated 24 Bollgard II lines developed by Australian seed companies, comparing protein expressed in leaf tissue and squares.

"These trials revealed that Bollgard II delivers two to three times the total expression of toxin in the terminal leaf," says Stewart. "Perhaps more exciting is the level of expression in squares, with Ingard showing average expression of cry1AC toxin at 27 micrograms per gram of dry weight compared with 150 micrograms in Bollgard II. A six-fold increase."

Ingard produces half the amount of protein in squares versus leaves (27 versus 50 micrograms), but in Bollgard II, squares produced more protein than leaves in the 24 lines under evaluation. "As that is the part of the plant we are trying to protect, that is comforting news," Stewart says.

Comparing trials from Warren to Emerald, Bollgard II average first position retention of 84 per cent compared with 68 per cent in conventional cotton and 74 per cent in Ingard. "This may require some further management development of Bollgard II to ensure high retention does not impact on the potential of the plant at the end of the season."

Looking at individual sites, Stewart says a trial at Boggabri required six sprays for heliothis on the grower's chosen conventional variety versus no sprays on DB50BXbx, a non-commercial line of Bollgard II. Total

sprays for all pests ended at seven on conventional and two on Bollgard II.

At Moree, there were 10 applications for heliothis on the conventional and none on Bollgard II. In a dryland trial at Gurley, it was five on conventional and none on Bollgard II.

At Dalby Agricultural College it was 12 versus none, with three sprays each for mirids.

Sprays for heliothis across all trials averaged 8.3 on conventional versus 0.2 on Bollgard II, and nine versus 2.5 for all pests.

For more information on GM trials, go to Office of the Gene Technology Regulator: <http://www.ogtr.gov.au>. For a video interview with Stewart Addison and a review of the trials, see Cottonworld Video, issue 15, spring 2002.

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