

Some papers provided further validation of the competitive nature of early weed infestations. Such studies are relatively easy now with Roundup Ready cotton. These trials conclude that heavy weed populations (even of small weeds) during plant establishment can result in a competitive disadvantage to the cotton crop. In Roundup Ready cotton, weed competition can be virtually eliminated by two applications in the OTT window. About 44 per cent of Roundup Ready fields were treated in this way in 2002.

There is no doubt that weed control is moving towards predominately post-emergence knockdown strategies with a number of papers reporting on trials with Staple, Envoke, Roundup Ready, and Liberty Link cotton. Approximately half the cotton acreage in the US no longer receives a pre-emergence residual herbicide application. Bayer CropScience will have limited areas of Glufosinate-ammonium resistant cotton available in the US in 2003.

*Also Cotton CRC.

Recordings of selected presentations can be found at www.csd.net.au or for details of any of the papers mentioned please do not hesitate to contact the authors of this article; Greg Kauter (07 4671 1648) or Brian Duggan (08 9166 4059).



New products the future of cotton biotech

Two major announcements were made at the Beltwide about potential new cotton biotech products. Both Syngenta's Vip gene and Dow's Widestrike may offer some new biotech choices to cotton growers over the next few years.

These are in addition to the announcements by Monsanto on the approval for Bollgard II and updates from Bayer on the future introduction of Liberty Link cotton.

Syngenta's Vip

Vip (vegetative insecticidal protein) cotton is the working name of a new product which has been submitted for registration with the US Environmental Protection Agency. Syngenta anticipates registration in time for US commercial sales in 2004.

Vip Cotton controls target pests through a novel mode of action.

It offers broad-spectrum, full season control of major lepidopteran pests, including heliothis and Spodoptera species such as fall armyworm and beet armyworm.

Current transgenic traits utilise proteins from the *Bacillus thuringiensis* bacterium known as delta endotoxins. The Vip protein (discovered by Syngenta in 1994) is an

exotoxin derived from the *Bt* bacterium. It is structurally, functionally and biochemically different to Bt delta endotoxins, making Vip cotton a potential choice to minimise the threat of insect resistance.

The Vip protein is expressed in the entire cotton plant, including the floral parts, to provide complete plant protection. When pest larvae feed on Vip cotton, the protein is ingested and causes the larvae to stop feeding and soon die.

"Despite heavy bollworm pressure in North Carolina in 2002, Vip Cotton delivered effective control throughout the season," said JR Bradley, professor of entomology at North Carolina State University.

"After years of study, Vip Cotton is expected to be our first introduction into the transgenic cotton market," said Ken Flower, Syngenta global seed and traits manager for cotton. "The new technology will have an immediate impact as an alternative to what is currently available and promises to offer even more benefits as our research continues."

Dow's Widestrike

Dow AgroSciences announced the selection of WideStrike as the brand name for its cotton insect protection trait.

The product — a combination of the Cry1F and Cry1Ac Bt proteins — has been in development and field study by Dow AgroSciences for several years. This is a different combination of Bt proteins than current commercial transgenic products. It is on track for regulatory approval and commercial introduction in 2004.

During 2002, the WideStrike insect protection trait was in 75 extensive agronomic, efficacy and resistance management trials across the US cotton belt. Preliminary results from those trials show season-long protection against a broad spectrum of lepidopteran pests such as cotton bollworm, tobacco budworm, pink bollworm, beet armyworm, fall armyworm, yellowstriped armyworm, cabbage loopers and soybean loopers.

An Experimental Use Permit for 2003 trials is expected from the US Environmental Protection Agency, with full federal registration anticipated in 2004. WideStrike will be introduced in elite varieties from Phytogen Seed Company in 2004, and is expected to be available in varieties from other cottonseed companies by 2005.

