

Strategies for success at Beltwide

By Adam Kay and Stephen Allen CSD, Greg Kauter ACGRA, Rod Mahon and Mike Bange CSIRO

The 2006 Beltwide Cotton Conference in San Antonio Texas had the theme 'Strategies for Success'. It was one of the best attended Beltwide for a number of years with over 5000 people registered. The Beltwide is split in two parts, with all of Wednesday and Thursday mornings featuring large grower forums looking at the big picture issues facing the US industry and hosted by the National Cotton Council (NCC).

Generally, the feeling from growers was good, as in many areas they had come out of the season with above average yields.

Of huge concern to many growers was the cost of energy (diesel). The 40 per cent increase in the cost of diesel was really starting to impact on growers and some talked about using less tillage and more sprays, while others were looking at bigger equipment that could till more country per gallon of diesel.

Interestingly, there was video footage of two new picking systems. One from Case that showed a picker that built the module on the go and another new picking design that used suction to remove the lint from the bush.

Panel sessions were held looking at the next generation of insect pests for US growers. These focused on plant bugs, stink bugs and spider mites.



Australian visitors to the Beltwide: Rachel Holloway (CRDC), Daniel Hamilton (QDPI&F) and Julie O'Halloran (NSW DPI).

Another keynote session was held on managing herbicide resistance. This was well attended and received, partly due to the recent confirmation of glyphosate resistance in Palmer amaranth (a major pigweed pest in the US).

The key message was early identification and action of any suspected resistant weeds. A panel session was held on variable rate technology where growers,

consultants and researchers looked at the current use of this technology.

On Thursday afternoon and Friday, the conference splits into 13 discipline-specific research conferences covering topics such as weeds, insects, disease and crop improvement.

TRADE AND MARKETING

The global cotton trade situation is a standing item on the Beltwide agenda and this year, discussions were dominated by the outcome of the recent World Trade Organisation meeting in Hong Kong. The National Cotton Council has publicly stated they are extremely disappointed with the latest WTO meeting statement regarding cotton.

The US domestic use of cotton has plunged over the past 10 years and last year exports were 16 million bales or 70 per cent of production. Imports of textile products have tripled since 1995 and in 2005 only around two per cent of production was utilised from 'dirt to shirt' in the US. This significant change has the cotton industry focused on what it will take to export around 15 million bales annually, an impact on world trade that Australian shippers are only too well acquainted with.



Roy Cantrell, Vice President of Agricultural Research, Cotton Incorporated with Greg Kauter, Executive Officer ACGRA.



CSD's Adam Kay with Texas Extension Agent, Harvey Buring.

◀ 26...2006 BELTWISE

In the same period China has emerged as the world's largest cotton producer, largest spinner, largest importer of raw cotton and largest US textile customer. The US industry leadership voiced strong concerns about China's favoured status as a developing country member of the WTO and its ability to continue to apply trade barriers in the form of export quotas and variable levies that effectively increase the price of cotton above Chinese synthetics and protect the Chinese man-made fibre industry.

The global cotton market was reviewed in a paper given by Gary Adams, Economic and policy analyst with the NCC. He noted that globally, man-made fibre use is 180 million bales and that cotton needs to increase demand and regain market share against man-made fibres (polyester and so on).

The US Farm Program which ensures price support along with other non-trade (or price) support programs always receives plenty of discussion at the Beltwide. A number of presenters referred to the lack of a strong market signal to growers to work on improving lint quality.

Dr OA Cleveland, Extension Marketing Specialist at Mississippi State University suggests that the Farm Program has led to growers receiving 'scant reward' for producing quality fibre. He made a direct appeal to growers to focus on 'quality cotton production' and become keener marketers of their cotton.

His challenge to the marketing sector was to become more proactive in rewarding growers who exceed base grade. His

message for the US industry was blunt: "Asia will look elsewhere and they will find ready suppliers in Australia and Brazil."

The new Farm Bill will be drafted in 2006-07 ahead of its passage through the House and Senate around April 2007. Extensive consultation is undertaken by the US House Representatives and Senate Agriculture Committee with industry and the community. There is sure to be a robust debate about the level of support and the mechanisms of delivery of payments to improve outcomes from the high level of public expenditure.

ECONOMICS CONFERENCE

The rising cost of energy was a strong theme throughout the conference. Oil price rises of 42 per cent in 2005 have led an overall rise in other energy prices, notably natural gas. US growers are also alarmed about the flow-on effects to input costs, especially fertiliser.

Many irrigators dependent on drip or overhead systems are busy determining where their breakeven yield levels will be in 2006 — not to mention checking on pumping efficiency.

Precision agriculture and variable rate input technology has become commonplace on the Beltwide agenda in recent years (there are 10,500 centre pivots in Texas alone). The development of hard and software has enabled producers to focus on both cost saving and optimum agronomic management for a wide range of inputs.

Considerable research and extension is underway to assist growers in adopting the best precision ag options for their farm. More information can be found at the Texas A&M University site <http://precisionagriculture.tamu.edu/>

A paper that attracted a reasonable amount of interest was presented on a comparison of profitability between the US and South America. The key messages were that input costs are lower in South America and yields are less variable than in the US (due to more reliable climate). But infrastructure is a problem and domestic exchange rates can have a big impact on the economics for US based farmers. Nevertheless there were plenty of interested US growers in the audience.

COTTON IMPROVEMENT CONFERENCE

The cotton breeding program has swung heavily towards molecular genetics in the past few years and not only transgenic engineering. Cotton Incorporated has a capacity building fellowship program in molecular biology for training young scientists along with programs for germplasm improvement and modified fibre characteristics. There are also numerous public and private research projects under-



The Beltwide featured a well attended trade display.

way exploring pathways for genetic resistance to cotton diseases and nematodes.

Variety development presentations were strongly focused on Roundup Ready Flex which was launched at the Beltwide conference. US growers have a wide range of Flex varieties available for planting in 2006 and many of the University based variety evaluation programs had specific trials for Roundup Ready Flex cultivars to report at the conference. Growers are generally pleased with the variety choice they will have for the 2006 planting.

COTTON DISEASE COUNCIL

The Cotton Disease Council included two symposia and 29 papers on seedling diseases (five), Fusarium wilt (three), Verticillium wilt (one), seed rot and hardlock (five) and nematodes (15) as well as the annual US disease loss estimates and the results of the annual Beltwide seed treatment evaluations.

Symposium topics were:

- Application technology —
 - Update on remote sensing;
 - Variable rate application
 - GPS and seed special applications as it relates to plant pathology and nematology in cotton; and,
- Disease resistance in cotton through

genetic markers and gene mapping.

One of the presentations even described 'seed specific' placement of in-furrow fungicides for seedling disease control.

The 'Cotton disease loss estimate report' compiles reports from each of 16 US cotton states. It was estimated that a total of 2.45 million bales (9.78 per cent) was lost to disease across the US during the 2005 season. Most of this loss was attributed to nematodes (4.71 per cent), seedling diseases (1.88 per cent), boll rots (1.49 per cent), Verticillium wilt (0.54 per cent), Texas root rot (0.50 per cent) and Fusarium wilt (0.33 per cent).

The most significant issue of the conference was the promotion of new seed treatments for nematode control which attracted huge interest. Four companies were promoting their new products.

The USDA has appointed new pathologists at Bakersfield, California and College Station, Texas to work on Fusarium wilt of cotton.

WEED CONFERENCE

The introduction of Roundup Ready Flex and Liberty Link cotton has focused weed research in the US on how these new technologies fit into the cotton weed control system. Many presentations on

weed control systems concluded that for fields with problem weeds, the use of residual herbicides continued to be an important addition to the use of transgenic herbicide tolerant cottons.

Research on the optimum timing for herbicide application commonly known as the 'critical period for weed control' has re-examined the cost of weed competition across the US cotton belt. This is very complex trial work but it has been made somewhat easier by Roundup Ready Flex cotton (as weed competition can be removed in an accurate manner across a range of treatments over a number of weeks).

The results of this work reinforce that early season competition from weeds can be costly in terms of yield. Numerous studies confirm a critical four to six week early season period for broadleaf weed control with yield losses of around 0.6 bales per week in untreated controls.

Concerns about the development of herbicide resistance continue with the confirmation of glyphosate resistant *Amaranthus palmeri* in Georgia in the south east of the cotton belt. Palmer amaranth is one of nine weedy pigweed species found in summer crops in the

30 ▷

NEW STANDARDS FOR industrial power

Power Options

3126B/C-9
175-350 hp
C-10/C-12
310-500 hp
C-15/C-16
425-660 hp

Engine Speed Options

1800-2100*rpm
*2500 for 3126B



- Superior Performance
- Diagnostics
- Commonality
- Programmable
- PTO Mode
- Increased Oil Change Intervals

Caterpillar Electronic Engines

NSW/ACT PHONE: (02) 9600 3915
VIC/TAS PHONE: (03) 9703 4000
QLD PHONE: (07) 3278 8441

SA/NT PHONE: (08) 8269 2722
WA PHONE: (08) 9353 2299

Energy Power
Systems



southern US and is a major weed of cotton.

The physiology of Palmer amaranth results in a formidable weed of cotton as it has a very rapid and competitive growth habit, female plants can produce up to one million seeds under good conditions and there are potentially two generations per summer. Roundup Ready cotton has proved particularly useful for the control of this weed.

Seed from plants surviving late season applications of Roundup in 2004 was used to produce controlled cross populations for greenhouse studies in 2005. These studies conducted by Dr Stanley Culpepper at the University of Georgia resulted in only 40 per cent mortality of the selected plants from the label rate of Roundup and required up to eight times the label rate to control the total population.

Field trials in 2005 have shown field populations with around 80 per cent control from one application which is considered a field failure due to the very high numbers of seedlings. In these situations, sequential applications only control around 30 per cent of the surviving plants.

This species is dioecious (male and female plants) and this is thought to be



Insects were a feature at the production conference.

advantageous for the development and spread of resistance as the species is reliant on cross pollination. The emergence of resistance reinforces that selection from continued applications of one herbicide group will advantage individuals naturally able to tolerate and survive that herbicide.

The resistant Palmer amaranth is believed to be present on over 200 hectares in central Georgia. Researchers at

the University of Georgia, in collaboration with Monsanto, are conducting further monitoring of this species from over 100 sites in Georgia to establish the level and distribution of resistant populations.

The development of glyphosate resistance in a previously susceptible major weed is a significant reminder of the importance of integrated weed management and of following the crop management plan for Roundup Ready cotton. Fortunately a number of other herbicides are labelled for the control of Palmer amaranth, and affected growers are still able to manage this weed with the addition of pre-emergent and residual layby products in addition to glyphosate.

Central Georgia growers also have an important message about detection of resistant weeds for their colleagues and they are equally applicable for Australian growers:

- Ensure that any weed survival from a labelled herbicide application can be explained.
- If weed survival cannot be explained look for indicators of resistance
 - one species survives while others do not;
 - weeds survive in small or scattered patches; and,
 - some plants of the same species are controlled and others are not.
- For Roundup Ready cotton, the crop management plan requires growers to contact Monsanto if weed resistance is suspected.

MOREE PICKER PARTS
For new quality JD & Case IH parts
COMPETITIVE PRICES GUARANTEED!

Full workshop backup with satisfied customer. Australia wide.

BHC
 Agricultural Implements & Machinery

All of our parts are subject to strict ISO 9000 factory quality control

Ph: 02 6753 3712

Fax: 02 6752 3681 — Email: lavee@mpx.com.au

INSECT CONTROL CONFERENCE

Entomology research in the US is now focused on the management of transgenic insect control traits and emerging pests not controlled by the transgenic technologies. Boll weevil and pink bollworm eradication programs still occupy a small amount of time on the conference agenda.

In the US, crop losses due to insects vary between five and 10 per cent and are declining. But the costs of insect control are not declining. Heliothis control, including access to Bt-cotton varieties, is the most costly practice, with sucking bugs a close second. Boll weevil remains an important cost but more through the eradication program than direct damage to cotton.

While unevenly distributed in the various growing areas, Bt-cotton of various varieties has been generally widely adopted. Similar to the situation in Australia, the reduced application of insecticides for heliothis control has led to the emergence from relative obscurity of the sucking bug complex. The trend is compounded in areas where the cotton industry's long time foe, the boll weevil, has been eradicated.

In the US the 'plant bug' complex contains insects (*Lygus* spp. etc) similar in activity to the Australian green mirid. And like mirids, plant bugs were historically coincidentally controlled by sprays for lepidopteron pests (heliothis and armyworms). In 2005 in Louisiana, the average number of plant bug sprays increased to six at an average chemical cost of US\$8 per acre.



Adoption of Bt technology has led to problems with plant bugs.



CSIRO's Rod Mahon gave a presentation at the Beltwide.

This represented 66 per cent of all insect pest sprays.

With new chemical control products proving very expensive and higher rates of traditional products required to overcome increasing resistance levels, researchers are looking to IPM and area wide management for additional tactics against plant bugs.

Single Bt gene Bollgard and two Bt gene Bollgard II are both available in the US and a number of growers report improved performance from Bollgard II varieties from further reductions in larvae control — especially in boll weevil eradication control areas (where Lepidopteron infestations can be induced by broad spectrum control of boll weevil).

Several presentations indicated favourable efficacy of the newly introduced Widestrike (expressing Cry1Ac and Cry1F) from Dow Agrosiences. Transgenic varieties expressing Vegetative Insecticidal Protein (VIP) from Syngenta are likely to be stacked with Cry1Ab toxins, are not yet registered and commercial releases remain 'a few years off'.

The US Environmental Protection Agency registrations for Bollgard (known as Ingard in Australia) and Bollgard II expire in September 2006. Interestingly, in the process of re-registering these products, Monsanto will argue for the removal of mandated refuges.

The argument is based on field data that indicate that in many of the cotton growing areas of US, the diversity of crops and other hosts available for heliothis is such that these 'natural' refuges generally contribute sufficient moths to fulfil the role of a refuge.

While the argument to EPA may or may not prevail, it is important that we do not assume that a similar situation is applicable in Australia where *H. armigera*, our major pest of cotton, is a repeat offender in evolving resistance and on occasions is largely restricted to cotton hosts. But this research has utilised techniques that would be valuable to assist further validation of the value of refuges in the Australian Bollgard II cotton system.

PHYSIOLOGY AND AGRONOMY CONFERENCES

A large emphasis in the agronomy area was on the release of Roundup Ready Flex. Many agronomic and physiology studies were initiated in all the states to test the performance of Roundup Ready Flex under different agronomic regimes.

The reason for this was that there was a belief that the varieties which contained Roundup Ready Flex were released relatively early and did not have the performance of their conventional counterparts. In fact, the recommendation from Monsanto was not to plant any more than 50 per cent of Roundup Ready Flex or mix the varieties on the farm.

There was also a considerable emphasis on testing the effect of different farming practices on fibre quality. Many studies incorporated economic analysis, including assessment of fibre quality on textile performance using micro spinning technologies. Many of the studies mentioned are also being conducted in Australia.

NOTE: Greg Kauter's attendance was supported by Monsanto and ACGRA. Mike Bange's attendance was supported by CSIRO, CRDC and Texas A&M University.