

Summary Beltwide cotton conference 2002 – Atlanta, Georgia

CRDC Sponsored attendee: Grant Roberts, Farming Systems Scientist, Australian Cotton CRC and CSIRO Cotton Research Unit

General Sessions (day 1 and 2)

Globalisation/Protectionism

The outlook for the American domestic textile industry is bleak and becoming worse (albeit the same as every other western country's textile industry). The number of mills has decreased significantly in the last 10 years mostly as a result of globalisation and the increased competition from countries with cheaper labour but lower living standards. This has resulted in a call for protectionism type policies by the mills, all in the name of protecting American jobs and companies. The author of this paper, Anderson Warlick (Parkdale Mills, North Carolina), made some powerful comments that would have gained large support from the farmer audience. He cited the increase in cotton clothing imports to the USA (without tariffs) from second tier countries and the inability to export back to those countries due to trade restriction or tariffs as evidence of an unequal playing field. His obvious solution was to retaliate with trade restrictions. As usual the discussion of free trade rarely involves all the industries that both benefit and lose from such policies making it difficult to determine who is actually winning. My discussion with several American farmers suggests that the farmers themselves are not winning. It is difficult to determine whether some of these farms would be viable without farm support schemes. Bill Dunavant Jr. provided perhaps the best solution for American growers – that is, to pay them not to produce cotton at all, rather than subsidise over production.

America's competitors

The session on American competitors production practices provided a slim overview of five other cotton producing countries (China, Australia, Brazil, India, West Africa). Most of the data was aimed at production area figures with some on production costs. Unfortunately there was little insight on how the production costs were calculated or what the main hurdles to production were in each country (i.e. water, insects, disease etc.). All presenters except the Australian presenter, Tim Drew (CSI), were associated with marketing of cotton and hence provided this flavour to the discussion. All were in agreement that China has the greatset potential to impact on world production and hence prices.

Secondary pests/transgenics

Roger Leonard (Louisiana State University) discussed the issues of increased secondary insects in low spray environments. Similar to our Ingard/Bollgard II potential problem, the use of selective insecticides coupled with Bollgard technology and poor weed control, mostly from Roundup Ready fields, was cited as the main reason. It was interesting to see Roundup Ready blamed as a potential source of refuge weeds for secondary insect pests. He put the weed escapes mostly down to late germinating weeds not controlled and the lack of residual herbicides used in the non-cotton areas of fields.

Cotton nematodes

There were several parts of days devoted to the ecology and management of nematodes in cotton systems. I did not attend any of these sessions, but it was clearly a major focus of the 2002 beltwide conference. Nematodes are considered to be an increasing problem with increasing incidence in the fields. They are also associated with the American fusarium strain. There does not appear to be the same association in Australia. Three species are now significant in the US.

Alternative Technologies

Precision Agriculture

The use of precision agriculture throughout cotton production areas in the USA is increasing at a steady pace. A unique use of digital cameras was discovered by the University of Missouri which allows digital pictures of cotton fields to be taken and with simple software filter out cotton plants from weeds or dead cotton plants from live ones. The images can be used to help make weed and re-plant decisions very accurately. The most exciting use of Precision Ag was the use of airborne imagery to help scout and apply insecticides, growth regulators and defoliants. By linking airborne imagery to a vegetative index in the cotton field the ability to apply agronomic treatments according to spatial variability becomes a reality. In all cases the use of an on-ground scout or cotton consultant was still essential in the decision making process.

Weed Science

Virtually every paper in this section could be divided into one of three topics - Roundup Ready, Liberty tolerant cotton (Glufosinate-ammonium) or CGA 362622 (formerly Enfield in Australia).

Roundup Ready

Many of the Roundup Ready papers compared Roundup Ready systems with conventional residual herbicide programs or against Liberty and Bromoxynil tolerant cotton. The big new news was the experimentation with enhanced Roundup Ready cotton, which should allow over-the-top applications of Roundup Ready herbicide up to the 12 node stage. Monsanto discussed they were still selecting the appropriate events to bring through back crossing to elite lines. A major concern is the appearance of another glyphosate tolerant weed, Horseweed (similar to Fleabanes in Australia) that could tolerate up to six times the rate of glyphosate that would normally control it. So far the problem seems to be limited to Eastern cotton regions, particularly Lauderdale county in Delaware (I think). In addition the control of Roundup Ready cotton volunteers in Roundup Ready Soybeans and vice-versa has created some weed control problems. Very few herbicides were identified that were both effective at controlling volunteers and cotton friendly. Ed Murdoch and Stanley Culpepper are working on this as a priority. Some excellent work in North Carolina (Wendy Pline, North Carolina State University) and Texas (Ramon Merry, Texas A and M) demonstrated the mechanism by which glyphosate causes pollen sterility and the importance of minimising glyphosate around male reproductive components. As glyphosate can be translocated through out the plant both vertically and laterally it will tend towards the strongest sinks, usually the first fruiting position.

Liberty

Liberty tolerant cotton is still finding its niche and may be a serious alternative to Roundup Ready cotton in some regions. Many of the papers presented still believed that residual herbicides will be required in combination with Liberty. Combinations of Liberty plus Staple caused some leaf speckling but no yield loss. There appears to be more variety × herbicide tolerant systems interactions in the USA, which is possibly a function of their different weed spectrum. Lloyd May and Stanley Culpepper from the University of Georgia are specifically involved in testing these interactions.

The control of velvetleaf was considered good by all transgenic herbicides, Liberty, BXN and Roundup Ready, which is encouraging information to know.

CGA 362622

CGA 362622 is the new Syngenta post-emergent herbicide. Most papers reported good results with this product, but only on limited weed spectrums. Researchers have already experimented with mixing Staple and CGA 362622 to try and improve the number of weeds controlled with these herbicides. One paper suggested some leaf damage to 5-leaf cotton. In addition the usual grass selective herbicide antagonism has also been evaluated. Syngenta in Australia are finding different results which points to the importance of local evaluation.

Overall none of the herbicide systems mentioned above gave complete control on their own and all had specific weed weaknesses. So far USA researchers haven't pushed an Integrated Weed Management system, which would be highly beneficial to them. Our own requirements for a more refined and regulated Roundup Ready management system are well advanced on practices in the US.

Cotton Improvement

Ray Benson, (University of Arkansas, Keiser) demonstrated why he believed that glyphosate applications were not required in the evaluation of Roundup Ready varieties using a data set collected from several university trials, both in Arkansas and Mississippi. Conventional weed control was used to eliminate competition from weeds as a factor. This analysis is slightly different to the one performed by May and Culpepper in Georgia.

One paper presented by Brian Savoy, (Stoneville seed company, Mississippi) discussed the transfer and dispersal of cotton pollen between transgenic material. Using 38 inch row spacing they determined that outcrossing occurred at row one 2%, row eight 0.9%, row sixteen 0.2% and by row 24 nil. They used Roundup Ready and BXN traits in their test populations with Bollgard and heavily sprayed fields to eliminate insects. They concluded that 8 rows of buffer were sufficient to achieve greater than 98% target purity.

Cotton Physiology

Many diverse topics were covered in this section. The topic of Ultra Narrow Row cotton continues to be popular with Texas researchers claiming yield increases, earliness and lower production costs. The Californian Twin Row system continues to gain favour, being a compromise of UNR and conventional row spacing systems and

often fits in well with their other rotation crops such as vegetables. Arizona researchers are also testing this hypothesis. There was a small but growing group of papers looking at the lint quality aspects of cotton physiology/agronomy. Number of fruiting sites, nitrogen management, defoliation timing and time of last irrigation were all identified as issues pertinent to quality.

Earliness systems

Bill Pettigrew (USDA, Mississippi) relayed his work over the last few years on managing crops for earliness in the Mississippi delta region. He examined genotypes that were cold tolerant, seed treatments, early plant growth regulators (PGRs) and early planting times. The main significant effect he achieved was early planting (3-4 weeks earlier), with a 10% yield increase averaged across all years. Other associated changes were faster canopy closure and early picking (up to 2 weeks).

Mark Silva (MSU) agreed with our own work that excessive nitrogen (dryland and irrigated) contributed directly to the need for additional insect control at the end of the season (range 9-26 days).

Seed size

Owen Gwathmey, (University of Tennessee), showed the importance of seed size for plant vigour but more importantly, reducing gappiness in plant stands. He suggested grading seed for size as an important management tool to help improve uniformity. There appeared to be no difference in emergence time based on seed size though.

Conclusion

The Beltwide cotton conference is well worth attending as it is one of the few conferences specifically devoted to all aspects of cotton research. There are too many concurrent sessions to attend all topics, but this also provides for some variety as well. I endorse the CRDC's continued support of sending at least one researcher to attend every year in order for the Australian research community to benefit from this information source and communication exchange.