

Germinating ideas

By CSD Extension and Development Team

In this issue of Germinating Ideas we provide an update on the progress towards commercial cotton production in the Ord and Burdekin areas, and also discuss a number of disease enquiries suspected of being caused by *Fusarium* wilt during the 2009 season.

Cotton in northern Australia

The high rainfall experienced during the wet season in northern Australia this summer continues to focus interest in the potential for cotton production in the Ord River Irrigation Area. With discussions about climate change, recurring drought and water reforms rarely far from the headlines, the attraction of a more secure supply of water for irrigation remains very enticing.

Extensive research carried out over more than a decade by the Cotton CRC and industry partners has demonstrated that economic and environmentally acceptable cotton production can be reliably and sustainably achieved in northern Australia (NORpak 2007). But experiences in the Burdekin over the past few summers illustrate that translating potential cotton

production to commercially viable areas is never without its challenges.

Reviving cotton in the Ord River Irrigation Area (ORIA)

In March this year, the WA Department of Agriculture and Food convened a meeting in Kununurra to consider the potential development of cotton as a commercial crop in the Ord River Irrigation Area. The meeting was well attended and included local growers, CSD, Queensland Cotton, Monsanto and other industry participants. The goal of the meeting was to consider the commercial opportunity for cotton in the Ord.

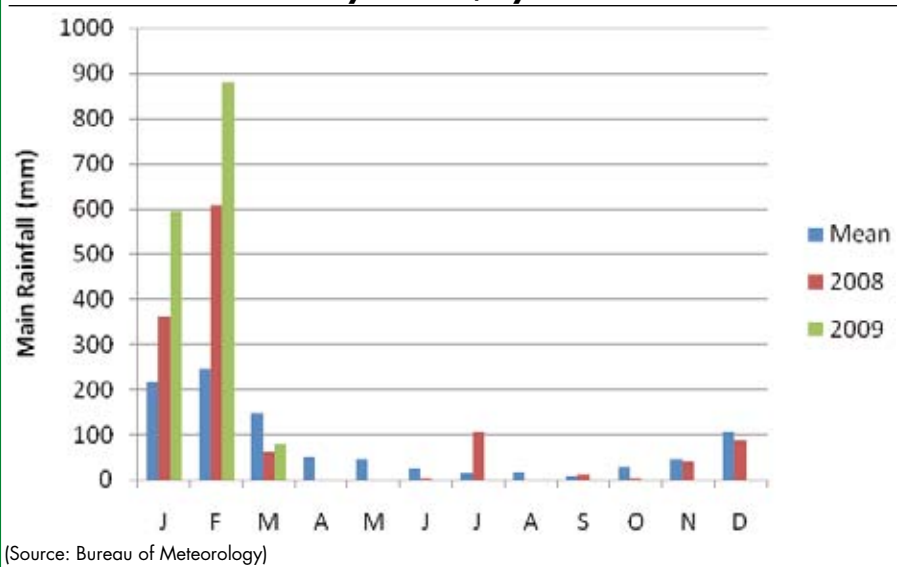
This meeting follows a couple of important milestones. Firstly, the recent decision of the Western Australian Government to lift the state's moratorium on growing biotech cotton. Previous attempts to grow cotton in the Ord region were spectacularly short-lived, particularly as a consequence of excessive pest control regimes. The advent of transgenic cotton varieties combining high yields with insect control and weed management systems is fundamental to future cotton production in the ORIA.

Secondly, and arguably a more important decision taken by the WA government, is to proceed with the development of an expanded irrigation area in the ORIA. Work on this development has commenced and it is estimated that developed agricultural land will become available in 2011. This development will cover an area of approximately 8000 hectares.

The industry based research and development efforts over many years has culminated in NORpak – Cotton production and management guidelines for the Ord River Irrigation Area (2007), compiled by Stephen Yeates, Geoff Strickland, John Moulden and Andrew Davies.

It is important to note that there are current constraints on the ability of growers ...48▷

FIGURE 1: Mean monthly rainfall, Ayr DPI Research Station.



Signage (top) referring to "The Ord expansion – Works on the existing channel infrastructure starting February 2009; Land available 2011." Lake Argyle (bottom), East Kimberley, WA.

to commit to cotton production. These chiefly relate to local ginning and processing capabilities. There is a small, research scale gin in Kununurra which has limited capabilities so any major expansion in cotton production would require a significant investment in local ginning infrastructure.

The potential for a small area of commercial cotton to be planted in the 2009 season is being examined. Further information on the NORpak guidelines can be found on the Cotton CRC website (www.cotton.crc.org.au).

Plight of the 2009 Burdekin crop

Although it has an abundance of water and an already thriving agricultural industry dominated by sugar cane and horticultural production, the potential development of a cotton industry in the Lower Burdekin is not without its challenges.

Over the past few seasons a modest expansion to around 900 to 1000 hectares of cotton in the Burdekin River Irrigation Area has focused attention on commercial scale production. Undoubtedly one of the greatest challenges for growing cotton in the tropics to date has been the impact of prolonged wet and overcast conditions.

The wettest months are traditionally January and February. As shown in Figure 1, close to 1000 mm of rainfall was recorded for this period in 2008 which was well above the mean monthly rainfall at Ayr. With 2009 being considerably wetter again, the crop has suffered further from the combined effects of water logging, low radiation and nitrogen shortages.

The almost continuous overcast weather in February this season has resulted in massive fruit shedding. It is not uncommon for combined first and second position reten-

tion on bottom five fruiting branches to be below 15 per cent. The wet conditions have also resulted in small bolls not shedding their dried floral remnants and aborting.

With Nodes Above White Flower approaching three or four in some crops, large applications of nitrogen have been side-dressed since the rainfall eased to encourage plant growth. Whether the cotton's relatively small root systems are sufficient to pick up enough nitrogen in time remains to be seen.

Traditionally the finer weather through March and April allows plants to compensate and crops will require a good finish for the 2009 crop to achieve an acceptable yield. The experience gained from growing cotton in these really wet seasons will stand growers in good stead for more average seasons.

Disease or lightning strike?

While Fusarium wilt has been common in some cotton crops this season there has been some confusion with other diseases and disorders of cotton with similar symptoms.

Sudden wilt has been observed in many of the crops this summer. It is not a common problem, and is usually associated with hot weather in the middle of the season. Several instances of lightning strike have also been reported as a potential disease issue.

While easy enough to confuse the symptoms with Fusarium wilt, the following information outlines crop effects and the main differences. "If in doubt, Check it out" – there is never any harm in sending samples for diagnosis by a plant pathologist.

Sudden wilt

Sudden wilt is caused by 'ordinary' species of Fusarium that are usually weakly pathogenic. Characteristically, affected

plants wilt suddenly, defoliate and usually die, although in some situations plants may re-shoot. Symptoms include a brown discoloration which is confined to the woody parts of the roots and lower stem only and is often evident just below the bark.

Sudden wilt usually occurs in small patches of plants, often extending along a single row. All affected plants develop symptoms simultaneously. With Fusarium wilt, symptoms may develop throughout the season and the brown discoloration in the stem extends from the roots to the top of the plant.

Sudden wilt often appears mid season and may be associated with water logging, especially in low-lying areas or tail drains. Root damage can be a contributing factor, particularly when a final cultivation or side-dressing is followed by an irrigation or rainfall and hot weather. The disease does not re-occur in the same places in the following crop.

Lightning

Patches of dead or damaged plants appear in either a circular or sometimes in an irregular pattern. Symptoms develop across an area of anything from a few metres to 50 metres in size. A key characteristic is that all plants may be killed, wilt and dry down quickly at the same height and without any loss in plant stand.

Sometimes in more mature crops only the top of the plant is damaged. Browning inside the stem may occur in the top of the plant but the roots and lower stem are unaffected, allowing some plants to reshoot and recover.

Acknowledgements to Dr Stephen Allen, CSD, for his input into this article.

For more information, checkout the Cotton IDM Guidelines on the Cotton CRC website (www.csd.net.au)



Tail drain end of variety trial in the Burdekin with the okra leaf variety on the right showing more white flower (mid March).



Sudden wilt (left) with affected plants extending along a single row. Lightning (right) with all plants killed at same time, leaves frozen on plants, and tops only affected in a few plants surrounding the dead area.

