

# Evaluating Roundup Ready cotton in the Ord

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If a winter season cotton industry is to develop on the Ord River Irrigation Area (ORIA), weed management will be an important consideration. Unlike traditional cotton growing areas in Australia, warmer dry season (winter) weather means that the same spectrum of weeds can grow during the wet and dry seasons in northern Australia.

As a result, weeds can quickly multiply over the wet season to become a significant problem in the subsequent dry season. Weed control is difficult during the wet season in the ORIA when tractor operations are limited due to the heavy clay soils.

Aerial application of herbicides over the wet season is possible but expensive and the choice of broad-spectrum herbicides limited. Finally, to avoid fibre discounts from early wet season showers, sowing needs to take place early in the dry season (late March or early April).

The current proposed weed management strategy involves using Stomp — either incorporating or surface application after sowing — followed by an inter-row cultivation at around the 10 node stage. This is usually successful in controlling barnyard grass and giant (black) pigweed, but it does not control native rosella or native hibiscus (see photo) growing in the plant line. Roundup Ready cotton potentially has a place in cotton production in



Native rosella (*Abelmoschus ficulneus*) — one of the most difficult to control weeds in cotton in the ORIA. (Photo G. Charles)

the Ord if growers can sow as soon as possible after the wet season, water up, then initiate weed control later.

## Options available

An experiment was conducted at the Kimberley Research Station in the 2003 dry season to investigate how Roundup Ready technology would fit into the dry season cotton production system proposed for the ORIA. The experiment consisted of eight treatments:

- Cover crop (dwarf pearl millet) over the wet season. Seed was direct drilled with Stomp (455 ai g/l at 3 l/ha surface

applied) plus Roundup (690 ai g/kg at 800g/ha) when the third leaf was expanding.

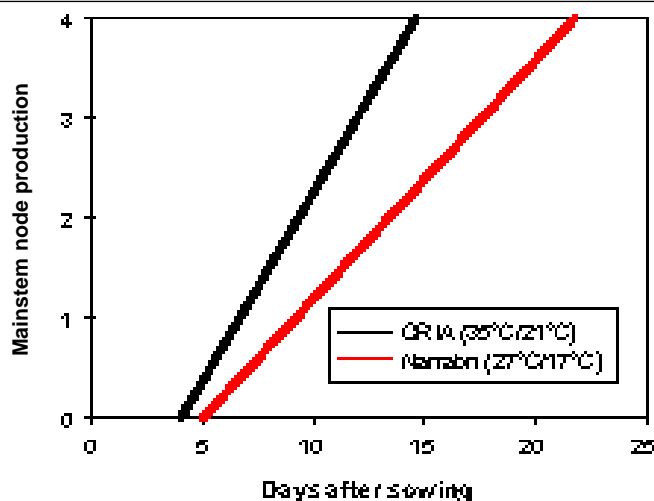
- Cover crop (dwarf pearl millet) over he wet season, seed direct drilled. Stomp alone.
- Dry season sorghum stubble retained. Seed direct drilled, Stomp plus Roundup.
- Dry season sorghum stubble retained, seed direct drilled, Stomp alone.
- Wet season fallow, cultivated, Stomp plus Roundup.
- Wet season fallow, cultivated, Stomp alone.
- Wet season fallow, cultivated, Roundup alone.
- Wet season fallow, cultivated, no herbicides.

Bollgard II/Roundup Ready cotton (CSX 415BR) was sown on March 21, 2003 and watered up.

## Potential problems

One of the greatest issues facing Roundup Ready cotton on the ORIA is the rate of early season growth of the cotton plants. With an average maximum/minimum temperature in late March/early April of 35°C/21°C, growth is much faster than traditional cotton growing areas in Australia (see Figure 1). With Roundup to be applied prior to the emergence of the fourth leaf, the ORIA will have consider-

FIGURE 1: Rate of mainstem node production for ORIA (April sowing) and Narrabri (October sowing)





Plots without (left) and with (right) Stomp applied. Beds were watered up to the plant line. This photo was taken 13 days after sowing.

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ably fewer days compared to traditional cotton growing areas in Australia. In this example, there were only 13 days available to apply Roundup to Roundup Ready cotton. This is a small spray window, particularly as rain could interfere with machinery operations at this time of year.

### Results

As expected, Stomp did a good job at controlling weeds early in the season (see photo). There was very little native rosella or native hibiscus in the paddock and the few weeds that did grow were giant pigweed which were not exposed to the herbicide. The application of Roundup also did an excellent job of controlling weeds

(see photo, page 15), although the combination of both herbicides was not required for effective weed control. Plots that did not have Roundup applied had to be inter-row cultivated at the 10th leaf stage to control giant pigweed which had germinated after the first irrigation.

Weed control was shown to be essential in this trial with all other treatments yield-

ing significantly more than the fallow without either herbicide (Figure 2). The treatments which involved the use of either cover crops (CC) or retaining stubble from the previous dry season in combination with either herbicide treatment were some of the highest yielding which provides hope for the use of a wet season cover crop or retention of stubble in a winter season cotton production system for the ORIA.

This is promising given the belief that a system involving minimal cultivation prior to the cotton being sown may be desirable. The treatments involving cultivating the soil prior to sowing also yielded well (over 7.5 bales per hectare), provided either Stomp or Roundup was used. There was no advantage in using the combination of both herbicides.

### Conclusions

- This experiment demonstrated the potential of Roundup Ready cotton in a no-till system where either stubble was retained or cover crops were grown over the wet season.
- Due to high temperatures there is a narrow window for the application of Roundup.
- Both Stomp plus inter-row cultivation and Roundup provided effective control of giant pigweed, although the combination of both was not required.
- Roundup Ready may be the preferred where Stomp resistant, but Roundup susceptible weeds, such as native rosella and native hibiscus, are a problem. Management of these weeds is a priority for future research

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The success of the Roundup application (foreground) on plots that did not have Stomp applied. Roundup was applied 13 days after watering up and this photo was taken 11 days later.

**FIGURE 2: Yield (bales per hectare), of various treatments in the Roundup Ready trial at Kununurra, 2003**

