

Comparing new herbicide options using shielded sprayers

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A wet start to the season can create a lot of post-emergent weed problems. If the rain extends over a long period of time, the weeds outgrow the cotton seedlings before it's dry enough to get machinery in the field to cultivate or spray.

The choice of options with a large inter-row weed population is limited. They include:

- Over the top applications of products like Staple which requires the weeds to be reasonably small.
- Inter-row cultivation which is an effective management tool, but has a number of limitations. Disturbing the soil causes moisture loss, root pruning, movement of weeds and possible compaction problems in wet soils. It is also only effective where the soil is drying otherwise weeds will continue to survive. In the 2001–02 cotton season, retaining moisture became important as conditions following cultivation continued hot and dry.
- Inter-row shield spraying where glyphosate is the most commonly used product.

In considering the management options available to control inter-row weeds, the use of a shielded sprayer is becoming an increasingly valuable tool. But to make them effective, they need to be of good design and correctly set up and they need to make use of a suitable herbicide option.

Emerging problem weeds

The management of problem weeds like Fleabane (*Conyza bonariensis*), Bladder Ketmia (*Hibiscus trionum*) and Cowvine (*Ipomoea lonchophylla*) is becoming an important issue because the mature stages of these weeds are showing considerable tolerance to normal rates of glyphosate.

A number of weed species are widely distributed in both irrigated and dryland cotton and represent a significant challenge for existing weed control technology. These are summarised in Table 1.

Available herbicides



The type of shield used and the experimental applicator which consisted of a minitank and electric pumps. The crop was about 50 cm high with good moisture. Spray volume was 134 L per hectare via three TeeJet TP 8001 EVS nozzles per

TABLE 1: Important weeds of cotton

Common name	Scientific name	Importance ranking
Noogoora burr	<i>Xanthium pungens</i>	High
Bathurst burr	<i>Xanthium spinosum</i>	Medium
Nutgrass	<i>Cyperus rotundus</i>	High
Cow (peach) vine	<i>Ipomoea lonchophylla</i>	High
Bladder ketmia	<i>Hibiscus trionum</i>	High
Yellow vine	<i>Tribulus terrestris</i>	Medium
Thornapple	<i>Datura stramonium</i>	High
Wild gooseberry	<i>Physalis minima</i>	Medium
<i>Polymeria pusilla</i>	<i>Polymeria pusilla</i>	Medium
Sesbania pea	<i>Sesbania cannabina</i>	Medium
Yellow-flowered devil's claw	<i>Ibicella lutea</i>	Medium
Volunteer cotton	<i>Gossypium hirsutum</i>	Medium
Barnyard grasses	<i>Echinochloa spp.</i>	Medium

Most registered post emergent herbicides are grass herbicides (up to seven are registered). There is only a small number of registered broadleaf herbicides for post-emergent use. Importantly, many of these broadleaf herbicides have set limitations on:

- Application timing (usually cotton must be more than 20cm high and the weeds very small).
- The number of sprays to be used (only once for Diuron); and,
- The re-cropping interval for following crops (for example 12 months for most crops following prometryn use).

Many of these broadleaf herbicides have similar modes of action (for example are Diuron, Prometryn, and Fluometuron are all group C herbicides and act similarly) and most have a tolerant weed spectrum.

The start of this research program aims to examine alternatives to glyphosate and how they might safely work in shield applications. Alternative chemicals were evaluated in an experiment in the Dalby district for weed control and crop safety. Most herbicides tested were damaging to cotton but no more than glyphosate. The efficacy results are shown in Table 2.

Key points

- Shielded sprayers should not be viewed as stand alone weed control. Total paddock weed control relies on early treatment of small weeds within the row using pre-emergent residual herbicides or early post-emergent Staple or Roundup Ready in combination with shielded spraying.
- Cotton growers need to be able to use herbicides other than glyphosate to ensure control of a range of weeds.
- Shields need to be properly set up to get the required results and avoid crop damage.
- It is essential to understand the mode of action of the herbicide to use it effectively under different conditions.
- Promising new herbicides include Basta (better control of mature Bathurst Burr, volunteer mungbean and cowvine than glyphosate) and Pledge. They could be strategically used to control weeds that show some tolerance to glyphosate.

For further information contact Mike Burgis

TABLE 2: Percentage weed control from the use of different chemicals tested in commercial shields

TREATMENTS	% weed control (mean of 3 replicates)					
	Caltrop (<i>Tribulus terrestris</i>)		Volunteer mungbean		Bathurst Burr (<i>Xanthium spinosum</i>)	
	7 DAT	21 DAT	7 DAT	21 DAT	7 DAT	21 DAT
Round Up Max 1.8L/ha	100	100	73	60	80	85
Round Up Max 1.8L/ha + Carfentrazone 120ml/ha (new product active — not yet registered)	43	10	40	3	32	0
Basta 4L/ha (new product — not registered)	92	95	83	97	82	100



The untreated areas of the trial giving an indication of weed size and population.

40
67
50
0
*

near the crop

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