

# Controlling volunteer Roundup Ready cotton

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The control of volunteer seedlings before planting cotton in spring is usually done as part of a knockdown program. While Roundup is not labeled for control of conventional volunteer cotton, there have been many mixtures applied that included Roundup, targeting a range of weed species.

The challenge for some growers was controlling Roundup Ready volunteers before the emergence of the new crop. The degree of this challenge is often related to the amount of rain over winter and the number of workings that a field received. The plant-back period of many potential control products is another limitation which reduces the options for growers.

This article looks at three years of Monsanto data. The size of the volunteer seedlings ranged from just emerged through to the 8-leaf stage.

## What did we find?

A number of chemical options gave commercially acceptable control (above 85 per cent). The economics of the respective products was not in the scope of the trials — the focus was identifying potential control options.

Flumioxazin across a number of rates provided very high commercial control. While we did see some phytotoxicity at the higher rates evaluated, this was not evident at lower rates.

Bromicide 200 provided good commercial control at the rates trialed. The lower rates (750mls per hectare and one litre per hectare) worked well on smaller seedlings but struggled on larger seedlings. The higher rate of Bromicide (1.5 litres per hectare) provided robust control.

Basta applied at three and four litres per hectare gave consistent commercial control.

The higher rate of Hammer provided very good commercial control. The lower rates were not as robust and consistent. There was also some trash coverage on some replications that impeded control.

Sprayseed 250 applied at a rate of 0.8 litres per

FIGURE 1: Summary of three years of trials on Roundup-Ready volunteer seedling control

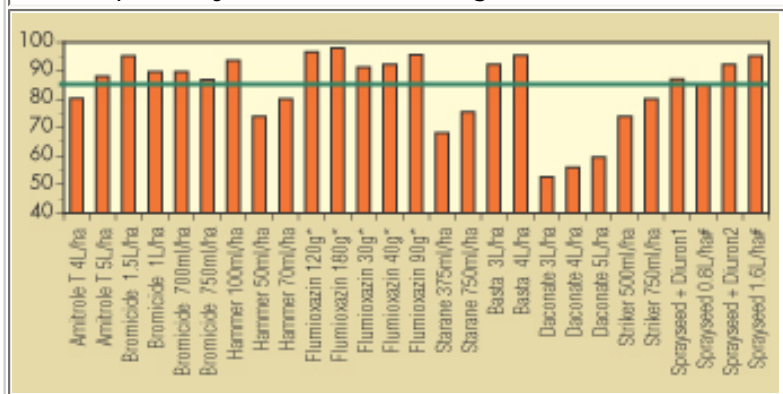


FIGURE 2: Percentage brownout 10 days after treatment

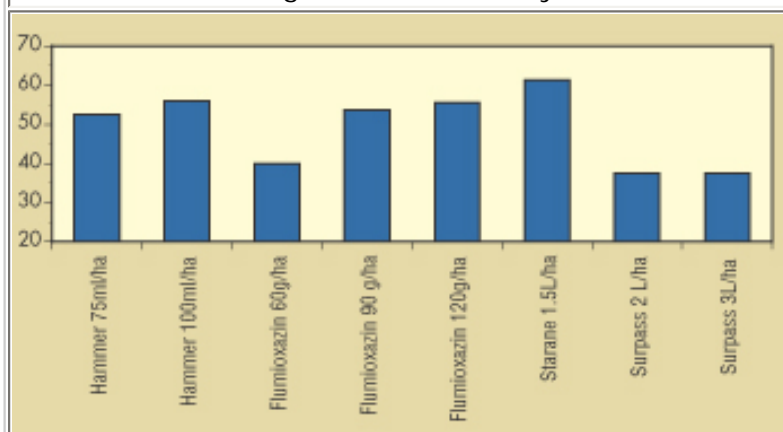
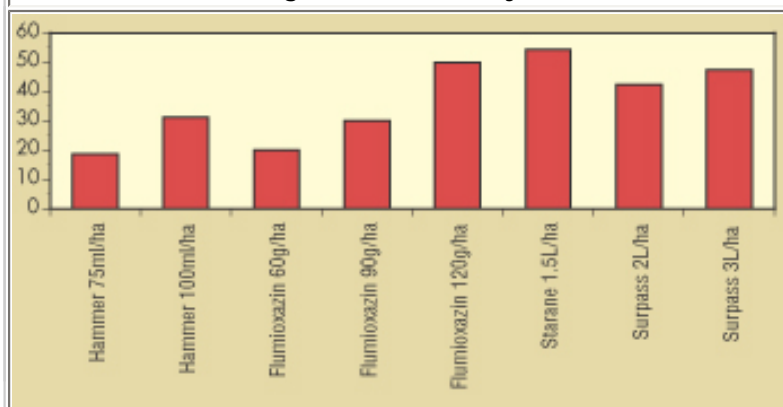


FIGURE 3: Percentage control 21 days after treatment



hectare provided commercial control on smaller seedlings. When applied at 1.6 litres per hectare, good consistent commercial control was observed. The addition of Diuron to Sprayseed did not have a significant effect on final control. Indeed, at the higher rate of Sprayseed, there was some drop off in the level of control.

Amitrole T at five litres per hectare also provided commercial control.

Moderate levels of control were observed with four litres per hectare of Amitrole T, 500 mls per hectare and 750 mls per hectare of Striker, and both 375 and 750 mls per hectare of Starane.

Poor control of seedling volunteers was observed with three, four and five litres per hectare of Daconate.

### Get them early

Volunteers, whether they are conventional or Roundup Ready plants are best controlled when they are small. Control past the six leaf stage becomes far more unpredictable because of the mode of action of most pre emergence herbicides, and requires considerably greater coverage to achieve commercial control.

Consideration needs to be given to trash levels and soil clods when making decisions on controlling volunteers. Both can impede coverage and efficacy.

There is a range of products that can potentially control volunteer cotton. There should be at least two more chemical options for volunteer control in the spring of 2003.

Interrow cultivation can eradicate volunteer numbers from shoulder to shoulder when timed correctly.

### Risk assessment checklist

A subjective assessment of whether volunteers will be an issue can be made at the end of August by asking a series of questions;

- Has the winter been dry? Volunteers will germinate over winter, more so in a mild, wet winter.
- How many passes have I put over the field in the winter? This will help in reducing volunteer numbers.
- Is there a lot of lint and seed in/on the beds?
- Is the field back-to-back or fallow?

- Am I going to water up or pre water? Monsanto recommends only watering up fallow fields where volunteers are thought not to be an issue. Pre irrigation is an effective means of germinating and eradicating volunteers.

## Controlling Ratoon or Stub Cotton

Cotton is a perennial plant, commercially grown as an annual plant. Once the fully mature fruit has been harvested, the plant moves from a physiological hiatus in reproductive growth, to grow vegetatively initially, then reproductively again. This growth is known as ratoon growth. This occurs because of the huge root mass present (from the previous crop) producing photosynthate and the plant having no 'sink' or area to deposit this photosynthate.

These ratoon plants are inherently difficult to control chemically due to their large root mass and the lack of non-persistent herbicide options.

Monsanto established replicated trials in the 2002–03 season in NSW and Queensland under permit to evaluate several herbicide options.

The ratoon cotton plants in this trial had regrowth up to 10–20 centimetres in length at the time of treatment. There was some mechanical damage to the plants that could be attributed to the planting process at one site, but the plants were actively growing at the time of application.

Application volumes were 75 litres per hectare and the spray pressure was 200 kpa. Sicot 189rr and Sicala V2rr were the two varieties evaluated.

Brownout (Figure 2) is very different to control (Figure 3), and in these trials commercially acceptable brownout or control was not achieved with any of the products evaluated.

Those herbicides that are contact inhibitors of photosynthesis are really limited in their effectiveness. The huge resources provided by the existing root mass cannot be influenced by this mode of action.

The suppressing effect of Starane is typical of what is seen in commercial experience. They do offer some control of regrowth until cultivation.

## Recommendations

Ratoon plants are notoriously hard to control due to the large root mass they have accumulated in their first crop. Commonly these ratoon plants are controlled by being 'root cut', and/or 'stalk pulled'.

During these operations there is always the opportunity for plants to be half cut or pulled leaving them to grow when they receive adequate moisture. It is these plants that growers find hard to control at a later date.

### Limited choices

These plants can only normally be controlled chemically by a residual herbicide which may have an extended plant-back period. These herbicides act predominantly via root uptake, hence their effectiveness. This method is not favoured due to the uncertain effect of the persistent herbicide on subsequent crop germination and growth.

Other alternate chemistries like the photosynthetic inhibitors are really the only choices left to the farmer.

Monsanto Australia has conducted trial work this past season demonstrating the ineffectiveness of these shoot uptake herbicides in controlling ratoons. Indeed Roundup is quite ineffective at anything other than minimal suppression of non-Roundup Ready cotton growth.

The recommendation is to use a phenoxy based herbicide to suppress growth of the ratoons, until a supplementary cultivation pass is undertaken.

Experience has shown that a very harsh frost has a good chance of killing ratoon plants over the winter period, before the next spring planting. This in combination with a low persistence phenoxy herbicide and a cultivation is the best way to control ratoon cotton, whether they be transgenic or non transgenic.

Always consult the respective labels and be aware of the plant back issues and soil persistence.

NOTE: These trials were done under APVMA permit number TPM0001A. The trials are presented for information only and no recommendations should be inferred. Some of the products mentioned may be subject to permit and/or may not be fully registered at the time of publication.