

Roundup Ready Flex[®] Cotton Crop Management Plan

The Monsanto Roundup Ready Flex Cotton Crop Management Plan is a legal requirement for the approved release of Roundup Ready Flex Cotton in New South Wales, Queensland and Western Australia. The purpose of the Roundup Ready Flex Cotton Crop Management Plan is to protect the sustainability of Roundup Ready Flex Cotton and to aid in minimising the risk of the evolution of glyphosate resistant weeds in the Australian cotton production system.

The Roundup Ready Flex Cotton Crop Management Plan aims to ensure that all persons involved in the growing and management of Roundup Ready Flex Cotton crops have a good understanding of the legal requirements, agronomic considerations and application options associated with the technology. The Crop Management Plan (CMP) involves five parts as listed below.

- Training and Accreditation
- Communication
- Monitoring, Reporting and Compliance
- Adverse Event Reporting
- Crop Management

1. TRAINING AND ACCREDITATION

The following stakeholders must complete the Roundup Ready Flex Cotton Accreditation Program before they can purchase seed:

- The Technology Service Provider (TSP) and any employees of the TSP who conduct duties with respect to the management and sale of Roundup Ready Flex Cotton, or provide advice on the growth and management of Roundup Ready Flex cotton.
- The grower and people responsible for making the on-farm weed management decisions in Roundup Ready Flex cotton.

The accreditation course includes attending a training session. A comprehensive Technical Manual, which covers all aspects of managing Roundup Ready Flex[®] cotton is provided at the course and is also available on-line at http://www.monsanto.com.au/products/cotton/grower_info/default.asp

It should be noted that agronomists have a duty of care to ensure that all recommendations made are in accordance with the CMP, Technical Manual, Roundup Ready[®] Herbicide label and Roundup Ready Flex cottonseed label.

2. COMMUNICATION

The CMP will form part of the Technology User Agreement (TUA) and the relevant details for growers documented in the Terms & Conditions document. Details of the CMP are incorporated into the accreditation course or communicated separately to relevant growers as required.

3. MONITORING, REPORTING AND COMPLIANCE

The approval of Roundup Ready Flex Cotton is the responsibility of the Office of the Gene Technology Regulator (OGTR), and the use of Roundup Ready Herbicide is approved by the Australian Pesticides and Veterinary Medicines Authority (APVMA). These regulatory bodies require detailed reports confirming the successful management of technologies such as Roundup Ready Flex cotton.

To meet the reporting requirements for the regulators Monsanto engages Technology Service Providers (TSPs) whose role and function is to:

- Sell Roundup Ready Flex cotton planting seed.
- Prior to selling the seed ensure the grower has an accreditation number and a current TUA. These must be recorded and then submitted to Monsanto.
- Complete the Planting Audit.
- Notify Monsanto immediately if they identify any compliance issues.

The information for these reports is captured via an audit and a survey, which are undertaken by TSPs during the Cotton Growing Season. The results of the audit and survey form the basis of the compulsory regulatory reports that Monsanto is required to submit to the OGTR, APVMA and the Transgenic and Insect Management Strategies committee (TIMS) Herbicide Tolerant Technical Panel. The audit and survey are outlined below:

3.1 Planting Audit

The TSP is responsible for completion of the planting audit by the required date, as set down in the TUA. The Information required includes:

- Number of hectares sown
- Location of Roundup Ready Flex cotton
- Date of sowing

3.2 Weed Management Post Spray Survey

- Growers or their nominated agronomist should assess weeds remaining ten (10) to fourteen (14) days after an “over the top” (OTT) application of Roundup Ready Herbicide at a minimum of 6 nodes of crop growth, and not exceeding 16 nodes. During these inspections, any surviving weeds that are normally sensitive to glyphosate application, should be identified and reported to their TSP.
- Only accredited TSPs will be able to conduct the Weed Management Post Spray Survey.
- TSPs will undertake the Post Spray Survey on a percentage of fields growing Roundup Ready Flex cotton in accordance with Table 1. TSPs will assess all weeds remaining ten (10) to fourteen (14) days after an “over the top” (OTT) application of Roundup Ready Herbicide at a minimum of 6 nodes crop growth, and not exceeding 16 nodes.

Table 1. Survey requirements for cotton fields containing RR Flex cotton

Row width	Configuration
< 50 ha	4 x 100 meters linear row
51 – 100 ha	6 x 100 meters linear row
101 – 150 ha	8 x 100 meters linear row
> 150 ha	8 x 200 meters linear row

The minimum distance between each 100m or 200m count must be 100 rows

The Weed Management Post Spray Survey must be completed by the TSP and provided to Monsanto prior to the date specified by Monsanto. Details required include:

- Any remedial action taken to stop seed set;
- Comments about the level of weed control achieved in Roundup Ready Flex cotton, including the efficacy of remedial actions undertaken; and
- Adverse event reporting.

Monsanto will collate this data and discuss the findings with relevant industry weed scientists and will report these findings back to the TMS Herbicide Tolerant Technical Panel.

In order to remain compliant growers must adhere to the following:

- Meet all requirements of the TUA;
- Meet all requirements of the CMP; and
- Use only glyphosate that is registered for use in Roundup Ready Flex Cotton.

4. ADVERSE EVENT ACTIONS/REPORTING

Growers and TSPs are required to report any adverse events, such as suspected weed resistance, to Monsanto as soon as it is identified. Monsanto will investigate the incident and produce a report if weed resistance is confirmed. Monsanto will also inform the TMS Herbicide Tolerant Technical Panel of any such activities.

In Roundup Ready Flex cotton, weeds identified to have survived Roundup Ready herbicide applications must be controlled by an alternative management strategy in order to prevent those weeds from setting seed.

5. CROP MANAGEMENT

Roundup Ready Flex crops must be effectively managed to achieve optimal yields, while protecting the integrity of the technology. To achieve the best results with Roundup Ready Flex cotton, management should commence before the crop is sown, and continue on past picking, in line with industry best management practices (BMP). The principle components of crop management are:

- Field identification
- In-crop management
- Integrated Weed Management Strategy (IWMS)
- Herbicide drift management
- Post-crop and volunteer management

These components are covered more fully in the Technical Manual.

- **Field identification**

Fields sown to Roundup Ready Flex cotton should be clearly identified on farm maps and at the boundaries of these fields to prevent accidental product application to a field not planted to Roundup Ready Flex cotton.

- **In-crop management**

To achieve the best result from Roundup Ready Flex cotton, weeds should be sprayed when they are small and are actively growing. Applications should not be made when weeds are stressed, when rain is expected soon after application, or when

high temperatures or strong winds make spraying conditions unsuitable.

Roundup Ready herbicide applications must comply with all conditions specified on the product label.

In-crop management should be part of a proactive integrated weed management strategy targeted to each individual field.

- **Integrated Weed Management Strategy (IWMS)**

The purpose of the Roundup Ready Flex cotton Integrated Weed Management Strategy (IWMS) is to minimize the risks associated with the evolution of glyphosate resistant weeds in Australian cotton production systems. Minimising this risk may best be achieved by following the integrated weed management strategy guidelines summarised below.

1. Scouting - Regularly check fields before and after herbicide applications. Ensure that weeds not controlled by a herbicide application are controlled by some other method.
2. Field Records - Maintain records of crops, weed control methods and the effectiveness of each management operation.
3. Accurate weed identification - Ensure that weeds are correctly identified, always be on the look out for new weeds.
4. Use as many different weed control options (chemical and non-chemical) as applicable in both crop and fallow phases (including in rotation crops).
5. Use the appropriate registered product for the target weed species and make every herbicide application count - use the registered rate that kills.
6. Enter a cropping phase with low weed numbers.
7. Farm hygiene – minimize new weeds entering fields. Clean down vehicles and equipment between fields.

- **Herbicide drift management**

Always ensure both crop and environmental conditions are suitable before spraying Roundup Ready herbicide onto a Roundup Ready Flex cotton crop. Conditions should be monitored throughout the spraying operation and all application guidelines of the registered herbicide label are to be adhered to. Spraying must cease whenever unsuitable conditions occur.

Growers should ensure that the spray applicator is made aware of the nature of all surrounding fields and of the possible consequence of drift from Roundup Ready herbicide applications.

- **Post-crop and volunteer management**

Ratoon and volunteer Roundup Ready Flex cotton plants will not be controlled by Roundup Ready herbicide, or any generic Glyphosate product.

As with conventional cotton, volunteer and ratoon Roundup Ready Flex plants may occur in fallows, and non-cropping areas of a farm such as irrigation ditches, module pads, water storages, etc. Volunteer and ratoon cotton should be controlled in both cropping and non-cropping areas as these plants may be a source of disease and insect infestations. These plants are best managed with cultivation and/or the appropriate registered herbicides. Growers should ensure that they have an effective weed management strategy developed for the control of these weeds.