Residual Herbicide Use in Cotton

What You’ll Learn...

- Soil residual herbicides in cotton should be included in multiple applications from preplant through layby.
- Residual herbicides gradually lose their effectiveness as they lay in the field waiting to be activated by rainfall or irrigation.
- Consecutive residual herbicides should be applied to overlap the effectiveness interval of the previous treatment to prevent weed escapes.
- Weeds that escape herbicide control should be removed by hand to prevent competition with crops and to prevent the addition of weed seeds to the soil seed bank.

Importance of Residual Herbicides

Soil residual herbicides are essential when developing a weed management program in cotton. Understanding the weed spectrum on the farm, and using both preemergence (PRE) and postemergence (POST) herbicides from preplant through layby, helps provide the most effective season-long weed control. Achieving optimum weed control in cotton will generally require that combinations, or systems, of herbicides are used which are specific for the predominant weed species. A combination of herbicides with POST and soil residual activity and multiple sites of action help to remove weed competition and provide a system for weed resistance management.

Preplant Weed Management

Residual herbicides used for preplant weed control in cotton will vary depending on the geography (Table 1). The use of dinotrofonil (DNA) herbicides, trifluralin, and pendimethalin, preplant in the fall or at the beginning of the season can provide a foundation for season-long weed management in southwestern cotton production. The effectiveness of DNA herbicides is related to how well they are incorporated into the soil, either mechanistically or through rainfall or irrigation. If poorly incorporated, DNA herbicides can quickly lose their effectiveness for weed control.

Rowe® Herbicide or Valor® EZ can be effective residual herbicides when applied preplant to cotton in many areas. These herbicides have soil residual activity on broadleaf weeds, including many winter annuals, marestail, kochia, and pigweeds, including Palmer amaranth. A minimum of 30 days must pass, and 1-inch of rainfall or irrigation must occur, between application of these herbicides and planting of conventionally-tilled cotton. Warrant® Ultra Herbicide and Warrant® Herbicide are also effective preplant weed management products, depending on the geography. The addition of Roundup PowerMAX® and dicamba or 2,4-D in a tank mixture with these herbicides helps to increase burndown activity on emerged weeds.

Weed Management at Planting

Using PRE herbicides with residual activity to control weeds at planting will continue to help prevent early-season weed competition to cotton. Caparol® and fluometuron herbicides can provide good soil residual control of many large-seeded broadleaf weeds like annual morningglories. Diuron herbicide provides control of small emerged Palmer amaranth, and up to several weeks of residual control of weeds including kochia. Warrant Herbicide, Warrant Ultra Herbicide, and pendimethalin are other PRE herbicide options for application at planting. If weeds are emerged at planting time, a Gramoxone® brand herbicide can be tank mixed to provide burndown.

In-Crop Weed Management

All residual herbicides lose effectiveness over time, allowing weeds to emerge after PRE applications. Additional residual herbicide should be applied before the PRE residual treatment loses effectiveness. Application timing of 14 to 21 days after a PRE treatment is generally a good time to apply POST treatments to overlap the effective residual activity. Once cotton has emerged, the options for broadcast applied residual herbicides becomes limited. Warrant Herbicide and Dual Magnum® are acetamides effective for the residual control of grasses and small-seeded broadleaf weeds. Acetamides control weeds prior to their emergence, and can be tank-mixed with a Roundup® brand glyphosate-only agricultural herbicide in glyphosate-tolerant cotton for burndown of existing weeds.

Post-directed herbicide applications can be used in taller cotton to control small weed seedlings in the row, and mechanical control can be used to control weeds in the furrows. Layby herbicide applications help to prevent the growth of weeds in cotton when it is no longer possible to cultivate. A layby herbicide application should be applied as a directed spray to minimize contact with cotton plants. Finally, escaped weeds should be removed by hand to prevent weed seed being returned to the soil seed bank.
Table 1. Herbicide Recommendations for Cotton with Genuity® Roundup Ready® Flex or XtendFlex® Technology.

<table>
<thead>
<tr>
<th>Application</th>
<th>Southeast</th>
<th>Midsouth</th>
<th>East Texas</th>
<th>West Texas</th>
<th>Arizona</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Monsanto PowerMAX® II + dicamba or 2,4-D</td>
<td>Roundup PowerMAX® II + dicamba</td>
<td>Roundup PowerMAX® + Rowel Herbicide, Warrant® Ultra Herbicide (East of Hwy 77), or Valor EZ</td>
<td>pendimethalin or trifluralin or Dual Magnum® or pendimethalin</td>
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<tr>
<td>Preplant, Burndown</td>
<td>Roundup PowerMAX® II or Gramoxone® SL + Rowel® Herbicide or Valor® EZ</td>
<td>Roundup PowerMAX® II or Gramoxone SL + Rowel Herbicide, Valor EZ, or Reflex®</td>
<td>Roundup PowerMAX® + Rowel Herbicide, Warrant® Ultra Herbicide (East of Hwy 77), or Valor EZ</td>
<td>pendimethalin or trifluralin (February–March) or Roundup PowerMAX + Rowel Herbicide or Valor EZ and/or 2,4-D</td>
<td>pendimethalin or trifluralin or Caparol</td>
</tr>
<tr>
<td>At Planting (PRE)</td>
<td>Gramoxone SL + Warrant Ultra Herbicide, Warrant Herbicide, diuron, or fluometuron</td>
<td>Roundup PowerMAX® II or Gramoxone SL + Warrant Herbicide, diuron, fluometuron, pendimethalin, or pyrithiobac-sodium</td>
<td>Gramoxone SL + Warrant Herbicide, diuron, Caparol®, or fluometuron</td>
<td>pendimethalin or trifluralin or Caparol</td>
<td></td>
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<tr>
<td>POST 1</td>
<td>Roundup PowerMAX® II + Warrant Herbicide or Dual Magnum® (14 days after PRE)</td>
<td>Roundup PowerMAX® II + Warrant Herbicide or Dual Magnum (14 days after PRE)</td>
<td>Roundup PowerMAX® + Warrant Herbicide, Dual Magnum, or pyrithiobac-sodium</td>
<td>Roundup PowerMAX® + Dual Magnum, or pyrithiobac-sodium</td>
<td>Roundup PowerMAX® + pendimethalin</td>
</tr>
<tr>
<td>POST 2</td>
<td>Roundup PowerMAX® II + Warrant Herbicide or Dual Magnum (6-8 leaf cotton if necessary)</td>
<td>Roundup PowerMAX® II + Warrant Herbicide or Dual Magnum (6-8 leaf cotton if necessary)</td>
<td>Roundup PowerMAX® + Warrant Herbicide, Dual Magnum, or pyrithiobac-sodium</td>
<td>Roundup PowerMAX® + Warrant Herbicide or Dual Magnum, or pyrithiobac-sodium</td>
<td>Roundup PowerMAX® + Caparol, diuron, or Layby® Pro</td>
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<tr>
<td>Layby, Hooded, Directed Spray</td>
<td>Roundup PowerMAX®II, Gramoxone SL, or MSMA+ Rowel Herbicide, Valor EZ, Caparol, or diuron</td>
<td>Roundup PowerMAX®II, Gramoxone SL or MSMA + diuron, Rowel Herbicide, or Valor EZ</td>
<td>Roundup PowerMAX®, Gramoxone SL or MSMA + diuron, Rowel Herbicide, or Valor EZ</td>
<td>Roundup PowerMAX® or MSMA + diuron, Layby Pro, Rowel Herbicide, or Valor EZ</td>
<td>Roundup PowerMAX® + Chateau®, Caparol, or Layby Pro</td>
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</table>

*Reflex must be applied 14 days prior to planting. NOTE: Chateau Herbicide is labeled for use in Arizona cotton. Warrant Herbicide is not labeled for use in Arizona. When using Warrant Ultra Herbicide, only apply 21 days before planting in medium-fine textured soils, and preemergence only in sandy soils (see label for application restrictions by soil type, geography, and use rates). No more than two applications of Warrant Herbicide may be applied in a single growing season. If using Warrant Ultra Herbicide, no more than one application of Warrant Herbicide may be applied in a single growing season. Refer to all product labels for use rates, application guidelines, rotational crop, and additional restrictions that may apply. For more details on cotton weed management recommendations and product use incentives, consult Roundup Ready PLUS Crop Management Solutions at www.RoundupReadyPLUS.com.

For additional information, contact your local seed representative. Developed in partnership with Technology, Development & Agronomy by Monsanto.