4-Step Program for Managing Glyphosate-Resistant Pigweeds in Cotton

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Glyphosate-resistant pigweeds—Palmer amaranth and common waterhemp—have developed in many Texas cotton farms and are expected to infest most of them unless farmers implement effective management strategies soon.

These weeds can reduce the yields of all Texas crops where glyphosate is used. If not controlled after a corn, sorghum, or wheat harvest, even more of the weeds will infest the following cotton crop. In most cases, by the time a farmer identifies glyphosate-resistant weeds in a field, they are too large for other selective cotton herbicides to control them effectively.

No new herbicides are on the horizon to control glyphosate-resistant pigweeds. New varieties of herbicide-tolerant cotton will likely be available in the next 2 to 4 years, providing some new herbicide options. However, planting these varieties in the future will not substitute for controlling glyphosate-resistant pigweeds and rotating herbicide classes or mechanisms of action now.

If proper action is not taken

If glyphosate-resistant pigweeds are not managed as recommended below, they will need to be removed by hoeing or pulling. Although hand removal is very labor intensive, leaving even a few plants will produce many more glyphosate-resistant plants in future crops. One female pigweed plant can produce over 500,000 seeds, and the pollen from glyphosate-resistant plants can spread several hundred yards to create glyphosate-resistant offspring in nearby fields.

Best management strategies

To minimize the losses from glyphosate-resistant pigweeds in cotton, take at least three of the four steps below. The key is to rotate herbicides with differing mechanisms of action to manage and prevent the development of herbicide-resistant weeds. Where appropriate, tillage can also help minimize these weeds.

1. Start clean

To destroy glyphosate-resistant pigweeds already growing in the fields, use burndown herbicide(s) containing non-glyphosate products or tank mixtures with glyphosate. If possible before planting, apply burndown herbicides that have residual soil activity to minimize new flushes of pigweeds. Use tillage, if appropriate, to destroy any pigweeds emerge.

For labeled products and planting restrictions for preplant burndown herbicides in cotton, see Weed Management in Texas Cotton (cotton.tamu.edu).

2. Prepare for planting

Apply a preplant incorporated (PPI) herbicide before planting and/or a preemergence (PRE) herbicide at planting. PRE herbicides must be activated by rainfall or irrigation. For lists of labeled products, see Weed Management in Texas Cotton (cotton.tamu.edu).

To maximize the performance of PPI herbicides, incorporate them thoroughly. Check the product labels for specific incorporation recommendations. Weed control often fails either because insufficient product is used, or because it is not incorporated well. Left uncontrolled, even a few weeds can cause big problems.

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Choose the cotton variety—Roundup Ready Flex, Glytol, Glytol/Liberty Link, or Phytogen Widestrike—that has the best herbicide-tolerant traits for your operation.

3. Manage the glyphosate-resistant pigweeds that emerge

Assume that your fields have or will have glyphosate-resistant pigweeds.

Roundup Ready Flex or GlyTol Cotton varieties

Treatment recommendations for Roundup Ready Flex or GlyTol Cotton varieties differ according to the types of weeds present, the farm’s location in Texas, and the suitability of tillage in the operation:

- If pigweeds have emerged, apply glyphosate with a tank mix partner such as Staple, Envoke, Dual Magnum, Warrant, or Prowl H2O to prevent additional weeds from emerging.
- If the pigweeds are ALS resistant, avoid Staple or Envoke as a tank mix partner with glyphosate.
- If other weeds but no pigweeds have emerged, apply glyphosate with a tank mix partner that has soil residual activity on pigweed, such as Warrant, Prowl H2O, or Sequence.
- If appropriate for your operation, use tillage to destroy the weeds between the rows.
- To control escapes, use spot spraying, hooded, or layby applications of herbicides. See Weed Management in Texas Cotton (cotton.tamu.edu).

Glyphosate + Liberty Tolerant varieties

Apply Liberty at 22 or 29 ounces per acre to weeds less than 4 inches tall. A key to the success of Liberty is good coverage. To help prevent new weeds from emerging, include a tank mix partner with soil residual activity on pigweed. If appropriate, use tillage for your operation. Use hooded or layby applications of herbicides to control escapes. See Weed Management in Texas Cotton (cotton.tamu.edu).

Liberty Link cotton varieties

Use sequential applications of Liberty at 22 or 29 ounces per acre to weeds less than 4 inches tall. Remember that a key to the success of Liberty is good coverage.

To help prevent new weeds from emerging, include a tank mix partner with soil residual activity on pigweed.

If appropriate, use tillage for your operation. Use hooded or layby applications of herbicides to control escapes. See Weed Management in Texas Cotton (cotton.tamu.edu).

4. Remedial control options: most expensive and least practical

Before seeds develop, destroy the plants using hand hoeing and pulling, and mature plants should be removed from the field to minimize seed deposit into the field. Although this method is cumbersome and expensive, keep in mind that seeds from the one weed you leave standing in the field can remain dormant but viable for up to 40 months.

For more information

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The suggestions contained herein are based primarily on herbicide labels and research conducted by the Texas A&M AgriLife Extension Service and Texas A&M AgriLife Research. The use of product names is not intended as an endorsement of the product or of a specific manufacturer, nor is there any implication that other formulations containing the same active chemical are not equally effective. Product names are included solely to aid readers in locating and identifying the herbicides suggested.