

4-step Program for Managing Glyphosate Resistant Pigweeds in Texas Cotton

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“Assume the Worst”:

- Glyphosate resistant pigweeds (Palmer amaranth and common waterhemp) are currently present on a significant portion of Texas cotton farms and are expected to infest the majority of farms in the near future if the management strategies below are not implemented.
- Although some crops have additional herbicide options, glyphosate resistant weeds will negatively impact the economics of all crops in Texas. In most cases, by the time resistant weeds are identified in a field, the weeds will be too large to be effectively controlled by other selective cotton herbicides.
- Uncontrolled resistant weeds following corn, sorghum, and wheat crop harvest, will lead to increased resistant weed levels in the following cotton crop.
- For the foreseeable future, no new herbicides are being developed to control glyphosate resistant pigweeds. New herbicide-tolerant cotton varieties will likely be available in the next two to four years and will provide some new herbicide options. However, these technologies will not be a “silver bullet” for controlling glyphosate resistant pigweeds and rotating herbicide classes or mechanisms of action will remain essential for managing herbicide resistant pigweeds.

Remember:

If glyphosate resistant pigweeds are not managed with the recommendations below, hand removal of glyphosate resistant pigweeds will be necessary. Hand removal is very labor intensive, but leaving even a few plants will result in substantially more glyphosate resistant plants the following seasons. After all, one female pigweed plant can produce over 500,000 seeds. Additionally, pollen from glyphosate resistant plants can spread several hundred yards and create glyphosate resistant off-spring in nearby fields.



Best Management Strategies for preventing and managing herbicide resistant pigweeds in Texas.

A minimum of 3 of the 4 recommendations below should be followed to minimize the impact of glyphosate resistant pigweeds in cotton. The key is to rotate herbicides with differing mechanisms-of-action for management and prevention of herbicide resistant weeds. Where appropriate, tillage is another weed management strategy that will reduce the risk of developing herbicide resistant weeds.

1. Start clean before planting:

- Use burndown herbicide(s) containing non-glyphosate products or tank mixtures with glyphosate to control the glyphosate resistant pigweeds. See Weed Management in Texas Cotton (cotton.tamu.edu) for labeled products and planting restrictions for preplant burndown herbicides in cotton.
- If possible use burndown herbicides with residual soil activity to minimize additional flushes of pigweeds prior to planting.
- Use tillage, if appropriate, in your operation to destroy emerged pigweeds.

2. Preparation for Planting:

- Apply a preplant incorporated (PPI) herbicide before planting and/or preemergence (PRE) herbicide at planting. Remember, rainfall or irrigation is necessary to activate PRE herbicides. See Weed Management in Texas Cotton (cotton.tamu.edu) for labeled products.
- For PPI herbicides, thoroughly incorporate to maximize herbicide performance. See product labels for specific incorporation recommendations. Weed control failures are often the result of insufficient rate and incorporation, and could leave a small percentage of weeds uncontrolled causing big problems.
- Identify the cotton variety with the best herbicide tolerant traits for your operation, whether it is Roundup Ready Flex, Glytol, Glytol/Liberty Link, or Phytogen Widestrike varieties.

3. Postemergence Weed Management: Assume you have or will have glyphosate resistant pigweeds.

- Roundup ReadyFlex or GlyTol Cotton varieties
 - only apply glyphosate with a tankmix partner if pigweeds are emerged, such as Staple, Envoke, Dual Magnum, Warrant, or Prowl H20. If ALS resistant pigweeds exist, avoid Staple or Envoke as a tankmix partner with glyphosate. Envoke is not currently labeled in West Texas.
 - if no pigweeds have emerged but other weeds have, apply glyphosate with a tank mix partner that has soil residual activity on pigweed, such as Warrant, Prowl H20, or Sequence.

- use tillage, if appropriate for your operation, to destroy weeds between the rows.
- use hooded or layby applications of herbicides to control escapes. See Weed Management in Texas Cotton (cotton.tamu.edu).

- **Glyphosate + Liberty Tolerant varieties**

- Apply Liberty at 22 or 29 oz/a to weeds less than <4" tall. Remember that thorough plant coverage with the spray solution is a key factor in the success of Liberty. The Liberty label recommends a minimum carrier volume of 15 gallons/acre. Under arid conditions, the efficacy of Liberty is typically lower and the use of ammonium sulfate is generally recommended.
- Include a tank mix partner with soil residual activity on pigweed to minimize additional weed flushes.
- Do not apply a tank mixture of Liberty and Roundup (glyphosate) because antagonism will likely result when these herbicide are applied together. It is better to apply these herbicides in a sequential application with 7-14 days between applications.
- Apply glyphosate at the label rate to control any weed escapes. Do not make the glyphosate application less than 10 days after the Liberty application because some regrowth will be necessary for glyphosate to work on previously injured weeds.
- use tillage if appropriate for your operation
- use hooded or layby applications of herbicides to control weed escapes

- **Liberty Link cotton varieties**

- Apply sequential applications of Liberty at 22 or 29 oz/a to weeds less than <4" tall. Remember that good coverage is a key factor in the success of Liberty.
- Include a tankmix partner with soil residual activity on pigweed to minimize additional weeds from emerging.
- use tillage, if appropriate for your operation.
- use hooded or layby applications of herbicides to control escapes.

4. Remedial control options: Most expensive and least practical.

- Destroy the plants prior to seed development using hand hoeing or pulling, although this is a cumbersome and expensive method, keep in mind that the one weed you leave standing in the field can shed a 500,000 seed and remain dormant but viable for up to 40 months.

The suggestions contained herein are based primarily on herbicide labels and research conducted by 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.



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This publication is no substitute for the herbicide product labels. It is intended to serve only as a guide for controlling weeds in cotton. Labeled rates and restrictions change constantly; therefore, consult the product label before use.

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