What You’ll Learn...

- Waterhemp, Palmer amaranth, common and giant ragweed are some of the toughest weeds to control in soybeans.
- Weed resistance is an ongoing problem in soybeans that requires proactive weed management.
- Warrant® Ultra Herbicide or Cobra® herbicide can be tank-mixed with Roundup® brand glyphosate-only agricultural herbicides to provide control of many broadleaf weeds in soybeans.

Weed Control

Recent research shows that soybean yield loss from weed competition occurs earlier in wide versus narrow row spacing.\(^1\) The critical period for weed removal in soybeans ranges from the V1, V2, or V3 soybean growth stages for 30, 15, or 7.5 inch on row spacing, respectively. Soybeans are least tolerant of weed competition in 30-inch rows versus 15- or 7.5-inch row spacing.\(^1\) Even if weed densities are similar between row spacings, narrow rows reduce the quantity and quality of light available to weeds, making weeds less vigorous and competitive with soybeans. Research shows that delaying weed removal beyond the critical period can result in a two percent yield loss for each crop leaf stage. For example, the critical period is defined as five percent soybean yield loss, if weed removal is delayed from V3 to V4 growth stage of soybeans, the yield loss will be seven percent.\(^1\) Weeds that emerge after pre-emergence residual herbicides breakdown compete with soybeans to reduce yield and produce weed seed to interfere with succeeding crops. Post-emergence (POST) weed control is necessary to manage weeds with extended emergence patterns, as well as weed escapes, to prevent yield loss and seed production.

Warrant® Ultra Herbicide

Warrant® Ultra Herbicide can be applied pre-plant, at-planting, and POST prior to soybeans reaching the R2 growth stage. Warrant® Ultra Herbicide provides residual control of annual grass and broadleaf weeds and POST control of broadleaf weeds. Warrant® Ultra Herbicide offers two different sites of action. The acetochlor active ingredient (Group 15) provides residual control of annual grasses and small-seeded broadleaf weeds, including foxtails, Palmer amaranth, and waterhemp (Table 1). The fomesafen active ingredient (Group 14) provides PRE and POST control of broadleaf weeds, including Palmer amaranth and waterhemp. To tank mix Warrant® Ultra Herbicide with Roundup® brand glyphosate-only agricultural herbicides on Roundup Ready® Soybeans and Genuity® Roundup Ready 2 Yield® Soybeans:

- Apply after soybeans are fully emerged up to the R2 stage of growth. Optimum application timing is the V2 to V3 soybean growth stages.
- Spray when weeds are 4 inches or less. Use the highest labeled rate for the area of use. Consult the glyphosate product label for use rates for tough-to-control weeds and heavy weed infestations.
- The unique formulation of microencapsulated acetochlor with fomesafen provides excellent crop safety for POST applications in soybeans compared to competitive products.
- For emerged, glyphosate-resistant or PPO inhibitor resistant weeds, or weeds not listed on the Warrant® Ultra Herbicide label, it may be necessary to add another labeled post-emergence herbicide to the tank mixture with a different site of action.

For specific crop and product recommendations visit www.RoundupReadyPLUS.com.

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Cobra® Herbicide

Tank mixing Cobra herbicide with Roundup® brand glyphosate-only agricultural herbicides can help manage tough to control broadleaf weeds in soybeans including waterhemp, Palmer amaranth, common, and giant ragweed. Cobra is a proto-porphyrinogen oxidase inhibitor (PPO, Group 14) with rapid, foliar contact action on emerged weeds. Good coverage of young, actively growing weeds is essential for maximum weed control.

- Apply Roundup® brand glyphosate-only agricultural herbicides tank mixed with Cobra when weeds are less than four inches tall. Small, actively growing weeds are most susceptible to foliar applied herbicides.
- Use Cobra at 10 to 12.5 fluid ounces per acre tank-mix with 32 to 44 fluid ounces per acre Roundup® brand glyphosate-only agricultural herbicides.
- Apply at or before the V3 growth stage of soybeans to prevent yield loss and target small weeds.
  - Once soybeans exceed the V3 stage of growth the canopy may interfere with spray coverage and reduce weed control and soil residual activity.
  - In drilled soybeans, application may be required prior to V3 to avoid soybean canopy interference.
- Late applications of this tank mixture may be applied through the R2 growth stage of soybeans. Cobra may be applied alone as late as R6 growth stage of soybeans.

- PPO inhibitor herbicides, like Cobra®, disrupt cell membranes wherever spray droplets contact exposed leaf surfaces. Symptoms may include necrosis, speckling, bronzing, or cupping or crinkling around leaf margins. New, unsprayed leaves are normally unaffected because PPO herbicides are not systemic. In tolerant crops like soybeans, foliar symptoms are temporary and rarely impact soybean yield. Consult the Cobra label for specific precautions. Roundup® brand glyphosate-only agricultural herbicide formulations contain adjuvants that complement the activity of Cobra without increasing the risk of crop injury.

PPO Herbicide Resistance Management

PPO inhibitor herbicide resistance has been confirmed in some waterhemp and Palmer amaranth biotypes. Multiple herbicide resistance has been confirmed in some weed species including waterhemp and Palmer amaranth, demonstrating the need to proactively manage herbicides to preserve herbicide options. To help manage PPO inhibitor herbicide resistance:

- Apply full rates of pre-emergence residual herbicides that are effective on target weeds.
- Use herbicides with multiple effective sites of action.
- Spray weeds when they are small.
- Use cultural practices such as regular scouting, crop rotation, and mechanical or hand weeding.

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

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