

Recommendations for Management of Glyphosate-Resistant **Waterhemp** in Illinois Soybean

STEP 1: Apply a *full rate* (according to label guidelines for soil type and organic matter content) of a soil-residual herbicide *no sooner than 7 days before planting*.

- Why invest in a soil-residual herbicide? Soil-residual herbicides may represent the only herbicide option for certain waterhemp populations. A waterhemp population resistant to both PPO inhibitors and glyphosate would not be controlled by any postemergence soybean herbicides. Waterhemp is competitive with soybean; previous research has shown that waterhemp can cause up to 40 percent soybean yield loss.
- Why use a full rate instead of a reduced (“set-up”) rate? Waterhemp germination and emergence extend late into the growing season. The later into the season that waterhemp emergence can be delayed, the greater the potential to maximize soybean yield.

STEP 2: The initial postemergence application of glyphosate (alone at 0.75 to 1.0 lb acid equivalent (ae)/ acre) must be made when waterhemp is 3 to 5 inches tall.

- Why use glyphosate alone instead of tank-mixing with a PPO inhibitor (such as lactofen, fomesafen, or acifluorfen)? Unless the herbicide sensitivity/resistance profile of the particular waterhemp population is known, the potential for significant antagonism with these tankmixes

Herbicide susceptible and resistant waterhemp following glyphosate application.



suggest glyphosate be applied alone. If the waterhemp population is confirmed to be:

- glyphosate-resistant: apply a PPO inhibitor followed 7 to 10 days later with glyphosate
 - PPO-resistant: apply glyphosate alone
- Increasing the glyphosate application rate from 0.75 to 1.5 lb ae/acre (the maximum rate allowed by label) did not consistently improve control of a confirmed glyphosate-resistant waterhemp population in field research trials (Table 1).
 - Susceptible waterhemp less than 5 inches tall is very sensitive to 0.75 lb ae/acre of glyphosate. Waterhemp plants that survive 0.75 or 1.0 lb ae/acre glyphosate when treated at 5 inches or less should be closely monitored.

STEP 3: Fields must be scouted 7 days after the initial glyphosate application to determine treatment effectiveness. If waterhemp control is inadequate and retreatment is necessary, consider applying a PPO-inhibiting herbicide (lactofen, fomesafen, or acifluorfen) at a full labeled rate (with recommended additives) as soon as possible.

- In field research trials, glyphosate-resistant waterhemp plants continued to grow at near-normal rates following treatment with glyphosate. If 7 to 10 days elapse before lack of control becomes obvious, glyphosate-resistant waterhemp plants might grow an additional 6 to 8 inches.
- PPO-inhibiting herbicides are the only remaining herbicide options for control of glyphosate-resistant waterhemp. Waterhemp control with PPO inhibitors is optimized when full rates are applied to small plants (5 inches or less).

STEP 4: Re-scout the treated field within 10 to 14 days. If any plants treated with a second herbicide application might survive, rogue these surviving plants from the field before they reach a reproductive growth stage.