CROP ProtectionUpdate

Technology Development by MONSANTO

Managing Waterhemp

Waterhemp has become one of the most troublesome weeds in the Midwest. Managing waterhemp can be challenging in agronomic crops, and it generally takes more than one herbicide application during the season to be successful. Growers should plan to control this weed in their corn and soybeans with preemergence followed by postemergence herbicide applications.

Why is it hard to control?

Waterhemp is a member of the pigweed family of weeds (Figure 1). Distinguishing characteristics of the weed are long and narrow leaves with no hairs on the leaves and stems and a very glossy appearance. Common waterhemp (*Amaranthus rudis*) and Tall waterhemp (*Amaranthus tuberculates*) are both native species to the Midwest. Since these species are similar with frequent hybridization between the two, they are often grouped into one waterhemp species. The weed is also dioecious, meaning that its male and female flowers are on separate plants. Therefore, two plants will mix their genes during reproduction to produce seed. This results in a lot of diversity within waterhemp populations that favors its survival in agronomic systems and increases its potential to develop resistance to herbicides.

Waterhemp has become more prevalent in corn and soybeans. It produces small seed that can emerge only from shallow depths, so it favors no-till and reduced tillage practices. Compared to most other summer annual weeds, it produces more seed, has a higher growth rate, and tends to emerge more continuously and late into the growing season. Therefore, the timing of herbicide applications becomes more critical to successfully manage waterhemp.

Waterhemp populations can be resistant to many different herbicides, including ALS-inhibitors (sulfonylureas, imidazolinones), PPO-inhibitors (diphenylethers), photosynthesis inhibitors (triazines), and glyphosate. It is important to use different herbicide modes-of-action and monitor their performance to help prevent the spread of resistant populations.

Use a Preemergent Herbicide.

Applying a soil residual herbicide with good preemergence activity on waterhemp is key to a successful control program. A preemergence herbicide will reduce early season competition and help provide more consistent control of waterhemp. It adds other herbicide modes-of-action in the program to help prevent the development of waterhemp resistant biotypes. It also expands the postemergence application window which provides more flexibility and can reduce weather related risks of untimely treatments.

Figure 1. Early growth stage of waterhemp. Courtesy: USDA ARS, online location: http://www.ars.usda.gov/is/graphics/photos/apr98/K8040-1.htm (Photo by Aaron Hager).

There are many preemergence herbicides for use in corn and soybeans that have good activity on waterhemp (Tables 1 and 2). This includes chloroacetamide herbicides such as Degree® and Harness® products in corn and INTRRO® in soybeans. Under ideal conditions, preemergence herbicides can provide full-season control of waterhemp. However, you should scout fields to determine if later emerging waterhemp plants are present and follow-up with cultivation or a postemergence herbicide to maintain control and prevent production of new weed seed.

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Make Timely Postemergence Herbicide Applications.

Since waterhemp continues to emerge late into the season, the timing of a postemergence herbicide application is important even after a preemergence residual treatment. Plants can vary in size when postemergence treatments are applied. Its important to target waterhemp plants when they are up to 4 inches and no more than 6 inches tall. You need to provide proper coverage, especially if the waterhemp population consists of a mixture of smaller and larger plants. Waterhemp also needs to be actively growing and not under heat or drought stress for good postemergence control.

In Roundup Ready® cropping systems, sequential herbicide programs using a soil-applied herbicide followed by a postemergence herbicide treatment with a different mode-of-action is recommended for managing waterhemp (Tables 1 and 2).

Integrated Management.

Combining cultural, mechanical, and chemical programs will provide the most consistent long-term control of waterhemp. Crop rotation and tillage will improve consistency of control. Timely scouting, proper herbicide timing, and implementing a herbicide program with multiple modes-of-action are key components for successfully managing waterhemp. For more information on waterhemp management programs visit the following websites:

www.weedtool.com
www.weedresistancemanagement.com

Table 1. Herbicide families for managing waterhemp in corn.

PREEMERGENCE

Chloroacetamides—
Harness®/Degree® (acetochlor)
Micro-Tech® (alachlor)
Dual® (metolachlor)
Outlook® (dimethenamid)

Triazines—
Atrazine
Simazine

Isoxazoles—
Balance Pro® (isoxaflutole)
Callisto® (mesotrione)

POSTEMERGENCE

Glyphosate—
In Roundup Ready® Corn 2: Roundup® brand agricultural herbicides

Triazines—
Atrazine + oil

Phenoxys—
2,4-D

Benzoic acids—
Banvel®/Clarity® (dicamba)
Marksman® (dicamba + atrazine)
Distinct®/Status® (dicamba + diflufenzopyr)

Isoxazoles—
Callisto® + atrazine
Impact® + atrazine

Table 2. Herbicide families for managing waterhemp in soybeans.

PREEMERGENCE

Chloroacetamides—
INTRRO® (alachlor)
Dual® (metolachlor)
Outlook® (dimethenamid)

N-phenylphthalimides—
Valor® (flumioxazin)
Gangster® (flumioxazin + cloransulam)

Triazinones—
Sencor® (metribuzin)
Boundary® (metolachlor + metribuzin)

Aryl triazinones—
Authority® (sulfentrazone)

Dinitroanilines—
Prowl® (pendimethalin)

POSTEMERGENCE

Glyphosate—
In Roundup Ready® Soybeans: Roundup® brand agricultural herbicides

Diphenylethers -
Cobra®/Phoenix® (lactofen)
Ultra Blazer®/Storm® (acifluorfen)
Flexstar®/Reflex® (fomesafen)

Tables 1 and 2 list a number of products with activity on Waterhemp species. Always consult the product label for information on rates, additive recommendations, and appropriate tank mix partners.

Source: D. Nordby, B. Hartzler, and K. Bradley. 2007. Biology and Management of Waterhemp. The Glyphosate, Weeds, and Crop Series. Purdue University Extension. GWC-13. www.ces.purdue.edu/new.