

# Johnsongrass Management in Soybeans



## Johnsongrass Distribution and Biology

- Likely introduced to the United States before the 1800s and named for Col. William Johnson; johnsongrass was initially used as a forage crop.
- Johnsongrass (*Sorghum halepense*) has naturalized throughout the southern United States and West Coast but is now reported to be present throughout much of the continental United States, plus Hawaii, where it is considered invasive.
- Predominantly grows as a weed in cultivated and no-till cropland, perennial field crops, hay fields, roadsides and other wasteland areas.
- A rapidly growing warm-season perennial, often with erect multiple stems that grow from 2 to 8 feet in height. Mature plants are capable of reproducing by seed and thick, scaly rhizomes.
- Johnsongrass rhizomes initiate new shoot growth when soil temperatures reach 60 degrees. Seeds germinate when soil temperature reaches 70 degrees. Plants emerging from seed are capable of producing rhizomes within 3 to 4 weeks.
- Individual plants are able to produce nearly 30,000 seeds per plant. Even though the viability of johnsongrass seed in soil remains high for as long as five years, seed can remain viable in soil up to 10 years.
- When johnsongrass populations are high, it can be very competitive with soybeans. Johnsongrass densities reaching 30 stems per 100 square feet reduce season-long soybean yield by between 59 and 88 percent. In another study, the amount of time required for johnsongrass to reduce soybean yield was eight weeks when soil moisture was abundant, but only three weeks under dry conditions.

## Herbicide Resistance in Johnsongrass

- Since the 1990s, johnsongrass has evolved resistance to four different herbicide sites of action. (Table 1)
- The first report of glyphosate-resistant johnsongrass in soybeans came from Argentina in 2005. Documented

Table 1.

| Group #                 | Group 1  | Group 2   | Group 3                | Group 9    |
|-------------------------|--|---|------------------------|------------|
| <b>Site of Action</b>   | ACCase Inhibitors  | ALS inhibitors  | Microtubule Inhibitors | Glycines   |
| <b>Product Examples</b> | Assure <sup>®</sup> , Fusilade <sup>®</sup> DX, Fusion <sup>®</sup> , Select <sup>®</sup> , Poast <sup>®</sup> | Accent <sup>®</sup> , Beacon <sup>®</sup> , Option <sup>®</sup> , Resolve <sup>®</sup> , Autumn <sup>™</sup> , Pursuit <sup>®</sup> | Prowl <sup>®</sup>     | glyphosate |

reports of glyphosate resistance within the United States occurred in 2007 (Arkansas), 2008 (Mississippi) and 2010 (Louisiana).

## Management of Johnsongrass in Soybeans

Best-management practices to control johnsongrass in soybeans require efforts to control plants that emerge from seed and rhizomes. Johnsongrass can emerge before soybean planting, and new plants are likely to emerge after soybean emergence.

- 1. Control existing plants at planting.** Johnsongrass present at planting should be managed with a burndown-herbicide application or tillage. For populations susceptible to glyphosate, the most effective burndown treatment should include an application of glyphosate. Other herbicide options include foliar-grass herbicides unless the johnsongrass population is resistant to Group 1 (ACCase inhibitor) herbicides. Foliar-grass-herbicide options include Assure II (quizalofop P-ethyl), Fusilade DX (fluziflof-P-butyl), Fusion (fluziflof-P-butyl + fenoxaprop-P-ethyl) or Select Max<sup>®</sup> (clethodim). For glyphosate-resistant populations, the use of a grass herbicide with ACCase site of activity or preplant tillage will be necessary. However, preplant tillage of plants with rhizomes can sometimes encourage vegetative reproduction and proliferation of more johnsongrass plants.
- 2. A soil residual herbicide can help suppress plants emerging from seed.** Although not always highly effective, a soil residual herbicide, such as Prowl (pendimethalin) or Treflan<sup>™</sup> (trifluralin), can provide partial control of johnsongrass emerging from seed. Plants that have already germinated from seed or are emerging from rhizomes will not be controlled with a soil residual herbicide.

**3. Apply an effective postemergence herbicide.**

Most johnsongrass is treated after crop planting and the weed has emerged. If the johnsongrass is glyphosate-sensitive, one of the most effective treatments in Roundup Ready® soybean systems is glyphosate applied to actively growing plants at a minimum of 0.75 lb. acid equivalent per acre. Other effective choices include Group 1 (ACCase) type herbicides such as Assure II, Fusilade DX, Fusion and Select Max, which can be applied to conventional or Roundup Ready soybeans varieties. To reduce the potential for johnsongrass resistance in soybeans, it is important to rotate between glyphosate and ACCase

inhibitor type herbicides (Table 2). Also, rotating fields to other crops, such as corn, will allow use of other alternative herbicides that have Group 2 (ALS inhibitor) site of activity, such as nicosulfuron (e.g., Accent® Q, Steadfast® Q) or primisulfuron (e.g., Beacon, Spirit®).

**4. Scout fields 10 to 14 days later for effectiveness.**

If johnsongrass escapes initial control or new plants emerge, glyphosate may be applied a second time in Roundup Ready soybeans or an ACCase type herbicide can be used on conventional or Roundup Ready soybeans. Weeds not controlled with the second application should be tested for herbicide resistance.

**Table 2.** Effective postemergence herbicides for johnsongrass control in soybeans, based on the type of herbicide resistance (consult label for weed growth stage and proper timing for application)

| Herbicides              | Group # | Susceptible    | Resistance to:   |                    |
|-------------------------|---------|----------------|------------------|--------------------|
|                         |         |                | ACCase (Group 1) | Glycines (Group 9) |
| Assure II               | 1       | X <sup>2</sup> |                  | X                  |
| Fusilade DX             | 1       | X              |                  | X                  |
| Fusion                  | 1 & 1   | X              |                  | X                  |
| Glyphosate <sup>1</sup> | 9       | X              | X                |                    |
| Select Max (clethodim)  | 1       | X              |                  | X                  |
| Poast                   | 1       | X              |                  | X                  |

<sup>1</sup> Glyphosate is available in various products and formulations and must be applied to Roundup Ready soybeans.

<sup>2</sup> "X" indicates good control of johnsongrass. However, subsequent POST applications may be necessary for complete season-long control.

For more information and links to additional resources, visit [www.TakeActionOnWeeds.com](http://www.TakeActionOnWeeds.com).

Technical editing for this publication was led by J.D. Green, Ph.D., and James Martin, Ph.D., University of Kentucky, in partnership with other universities in the soybean-growing regions of the United States. The United Soybean Board does not make any representations or warranties relating to the use of the advice contained herein, and is not liable for the use or misuse of the information provided. Take Action is supported by BASF, Bayer, DuPont, Dow, Monsanto and Syngenta. ©2014 United Soybean Board.

