JOHNSONGRASS CONTROL

PURDUE UNIVERSITY
Extension

FNR-647-W

Do's

- Prepare the site for herbicide application with mowing.
- Combine various control practices.
- Prevent johnsongrass seedlings with imazapic as a preemergent (Apr).
- Treat johnsongrass seedlings when they are 2-8 inches with clethodim, imazapic or glyphosate (~May).
- Spot treat johnsongrass with clethodim, sethoxydim, imazapic, or sulfosulfuron (May-Jun) in diverse plantings.
- Consider a late-growing season fire combined with a follow-up herbicide application.

Don'ts

- Use light or moderate tillage.
- Mow johnsongrass after it has produced seed.
- Mow johnsongrass infrequently as a control method.
- Use prescribed fire during the dormant season as a standalone practice.

Johnsongrass (*Sorghum halepense*) is an invasive warm-season perennial grass common in Indiana. Johnsongrass can readily reproduce from rhizomes and seed. Seedlings can initiate rhizomes as few as 19 days following emergence. This ability to produce seed and rhizomes encourages rapid spread, making Johnsongrass difficult to control. Dense stands of johnsongrass offer poor structure for wildlife and little food value, especially if johnsongrass outcompetes native plants.

Plant Facts

- Warm-season perennial grass, 2-7 feet tall
- Spreads by seed and rhizomes
- Growing period: Late-April/early-May to October
- Flowering: June to October
- Seed Production: late June to October

EXPERT REVIEWED

Control Options

Johnsongrass is best controlled by preventing its growth, spread, and seed production, and by killing seedlings before rhizomes are formed. A combination of practices is often required.

Mowing

Spot mowing johnsongrass on a repeated (at least monthly), or strategically timed, rotation during the growing season may kill seedlings, deplete carbohydrate reserves in rhizomes, and with proper timing prevent seed production. However, mowing, especially infrequent mowing, is generally ineffective as a stand-alone practice for controlling established stands of johnsongrass. Additionally, frequent mowing during the growing season will also reduce many native plants and reduce the quality of habitat for wildlife. Avoid mowing after johnsongrass produces seed, as it can spread the seed. Frequent mowing is best suited for new stands of johnsongrass, rather than established stands, or in areas where you wish to limit its spread. Mowing is also useful as a site preparation method before an herbicide application.

Prescribed Fire

Prescribed fire may help reduce johnsongrass, depending on the timing of the fire. The use of late-growing season prescribed fire (Jul to early-Oct) has been shown to reduce johnsongrass density. However, dormant season prescribed fire (Nov-Mar) is not effective for controlling johnsongrass and may make the infestation worse. However, dormant season prescribed fire will prepare the site for spring or summer herbicide applications. Regardless of the time of fire, a follow-up herbicide application will provide better johnsongrass control.

Herbicide

Herbicides containing the active ingredients glyphosate, sulfosulfuron, imazapyr, imazapic, clethodim, sethoxydim, and multiple applications of fluazifop-P-butyl have been shown to be effective for johnsongrass control. In established conservation plantings, johnsongrass can be controlled after emergence (postemergence; May-Jun) with an application of clethodim, sethoxydim, imazapic, or sulfosulfuron with limited damage to native vegetation. Clethodim, fluazifop-P-butyl, and sethoxydim are grass-selective herbicides; therefore, they will harm grasses but not forbs. Many native grasses are tolerant of sulfosulfuron and imazapic, and some native forbs are tolerant of imazapic. Control seedling johnsongrass (but not rhizomatous johnsongrass) before it emerges (preemergent; Apr) with an application of imazapic. In diverse native plantings, spot treatments or wick applications (when johnsongrass is taller than native vegetation) can limit non-target damage. Resistance to herbicides such as glyphosate, clethodim, fluazifop-P-butyl, and sethoxydim, has been documented in johnsongrass.

Tillage

Disking, plowing, or other tillage can both increase and control johnsongrass, depending on the timing, frequency, and intensity. Fall tillage, especially heavy tillage (exposing >70% of the soil at a depth of 3 to 5 inches), can cut rhizomes into small pieces and expose them to cold temperatures, killing them. Regular intensive tillage during the growing season can also reduce johnsongrass. However, moderate or light tillage in the fall that does not expose the rhizomes to cold temperatures, or when conducted in the growing season can increase the infestation by spreading viable rhizomes throughout the field. Disking can also increase the spread and occurrence of other invasive species. Therefore, be cautious when using tillage as a tool to control johnsongrass.

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Additional Resources

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Loux, M.M., Doohan, D., Dobbels, A.F., Johnson, W.G., Young, B.G., Ikley, J., & Hager, A. 2018. Weed control guide for Ohio, Indiana and Illinois. Ohio State University Extension.

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Rocateli, A. and M. Manucherhri. 2019. Johnsongrass in Pastures: Weed or Forage? Oklahoma State Cooperative Extension Service. PSS-2598.

Conservation Program Disclaimer: *The management practices in this publication may conflict with cost-share program (e.g., CRP) rules and regulations (e.g., primary nesting season). If you are enrolled in a conservation program, please consult with an agency representative before utilizing a prescribed practice.*

Control Scenarios

Below are only a few examples of common scenarios in the field. Many other scenarios exist. For your specific conditions, please consult a biologist.

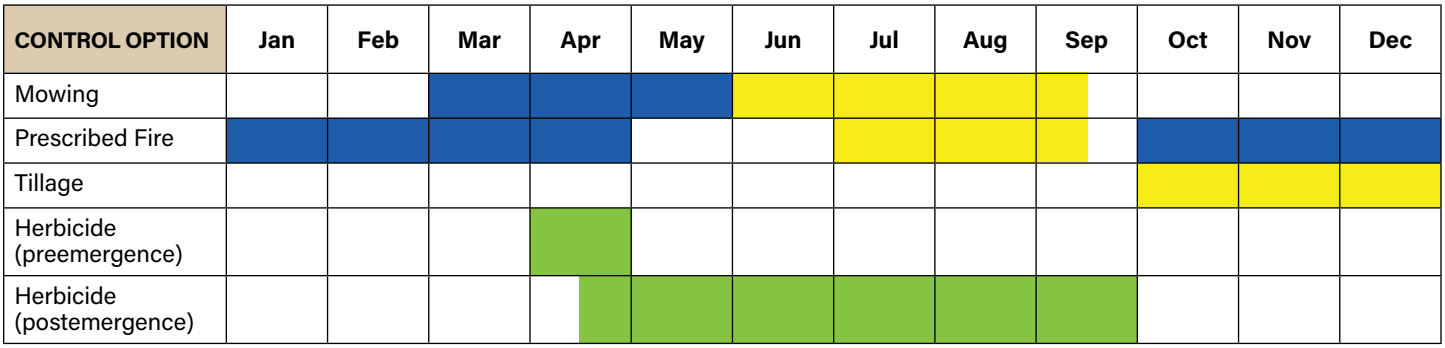
Native grassland with high-forb diversity and/or low johnsongrass infestation

OPTION 1.	OPTION 2.
Year 1 ▪ Prepare the site with a spring mowing (Mar-Apr). ▪ Treat johnsongrass regrowth with grass selective herbicide like clethodim during the growing season (May -Jun). ▪ Spot mow or treat any remaining johnsongrass prior to flowering. **Year 2** ▪ Treat johnsongrass with a preemergent application of imazapic prior to native plants emerging (~Apr). ▪ Spot treat remaining johnsongrass with clethodim (May-Jun). **Year 3+** ▪ Spot treat johnsongrass with clethodim (May-Jun).	**Year 1** ▪ Utilize prescribed fire during the late-growing season (Jul-Sep). **Year 2** ▪ Spot treat johnsongrass with clethodim during the growing season (May-Jun). **Year 3+** ▪ Spot treat johnsongrass with clethodim during the growing season (May-Jun). ▪ Utilize late-growing season prescribed fire as needed.

Old field, native grass pasture, or CRP field with low forb-diversity and heavy johnsongrass infestation

OPTION 1.
Year 1 ▪ Prepare targeted areas for herbicide application with a spring mow (Mar-Apr). ▪ Broadcast spray johnsongrass with clethodim, sulfosulfuron, or imazapic (May – Jun). ▪ Spot treat any remaining johnsongrass with clethodim, imazapic, or glyphosate (Aug-Sep). **Year 2** ▪ Mow any johnsongrass regrowth to prevent seed production and treat with clethodim, imazapic, or glyphosate. **Year 3+** ▪ Mow any johnsongrass regrowth to prevent seed product and treat with clethodim, imazapic, or glyphosate.

Control Timeline



Control[1]

Suppression[2]

Site Preparation[3]

[1] Control = provides effective control of Johnsongrass

[2] Suppression = reduces johnsongrass vigor, dominance, or seed production, but may not provide long-term control

[3] Site preparation = used prior to herbicide application to improve herbicide efficiency

Herbicide Recommendations

Active Ingredient	Trade Names[1]	Application rates[2]	Application Timing	Adjuvant Information[3]	Additional Information
clethodim	Clethodim 2EC, Select Max	**Broadcast:** 6-16 oz/ac (Clethodim 2EC) **Spot Spray:** 0.33-0.65 oz of clethodim (Clethodim 2EC) per gallon of water	May to June when seedlings are 2 to 8 inches or when rhizome johnsongrass is 8 to 18 inches tall and prior to bolting	Add COC at 1qt/acre and AMS at 2 lb/A to generic clethodim products.	Use lower rate for seedling johnsongrass control. Multiple applications often required for rhizome johnsongrass. Second application should be 2-3 weeks after first application.
fluazifop-P-butyl	Fusilade DX	**Broadcast:** 8 oz/ac (seedling johnsongrass); 12-24 oz/ac (rhizome johnsongrass) **Spot Spray:** 0.75 oz of Fusilade DX per gallon of water + 1.5 oz of COC OR 0.5 oz of NIS	May to June when seedlings are 2 to 8 inches or when rhizome johnsongrass is 8 to 18 inches tall and prior to bolting	Add COC at 1% v/v or NIS 0.25-0.5% v/v to improve herbicide performance	Rhizome johnsongrass may require two applications in same growing season, 12-24 oz/ac for first application (when johnsongrass is 8-18 inches tall) and 6-16 oz/ac for second application (when johnsongrass is 6-12 inches tall).
glyphosate	Roundup, Gly Star Plus, and others	**Broadcast:** 1.5–2 qt/ac **Spot Spray:** 2-3% solution of glyphosate by volume	May to June or August to September (Johnsongrass begins allocating carbohydrates from leaves to rhizomes in fall)	Add AMS (2-3 lbs/A). Add NIS to improve control of tough to control species of if the formulation does not contain a spray adjuvant.	No selectivity. Will also kill native grasses, forbs, and other beneficial plant species.
imazapic	Plateau, Panoramic 2SL	**Broadcast:** 4-6 oz Preemergence (johnsongrass seedlings; Plateau); 12oz postemergence **Spot Spray:** 0.3-1.9 oz Plateau per gallon of water	April (Preemergence), May to June (Postemergence) when johnsongrass is 18-24 inches tall	Apply with NIS (1 qt./100 gal.). Plateau can be more effective when applied with MSO (1.5 to 2 pts./A) instead of NIS, but will be more injurious to the existing plants. The addition of AMS may improve control of certain weeds, but will also increase risk of injury to non-target plants	Select native grasses and forbs are tolerant of imazapic at specific rates (see label).
imazapyr	Arsenal, Arsenal AC, Polaris, Polaris AC	**Broadcast:** 2-3 pt/ac (Arsenal) **Spot Spray:** 0.5-3% solution of imazapyr by volume (Arsenal)	May to June or August to September (Johnsongrass begins allocating carbohydrates from leaves to rhizomes in fall)	Apply with NIS (1 qt./100 gal.).	Imazapyr is soil active and may damage desirable overstory trees by translocation throughout the root system. Do not spray imazapyr within the dripline of desirable trees. Many Rubus species and legumes are somewhat tolerant of imazapyr. Arsenal AC is the Applicator's concentrate and has 2x the active ingredient of Arsenal.
sulfosulfuron	Cryder, OutRider	**Broadcast:** 0.75-2 oz per acre **Spot Spray:** equivalent to broadcast rate	May to June apply when johnsongrass is 18-24 inches tall (before bolting)	Apply with NIS (0.25 to 0.5% v/v)	Some native grasses are tolerant of sulfosulfuron (see label). Controls various grass and broadleaf weeds.

[1] Product names are provided as examples and for educational purposes. Several other products with the same active ingredient may exist. Listing of the products does not constitute an endorsement.

[2] The rates for these applications are provided for one specific product as an example. These products are sold under several trade names with different concentrations (active ingredients per gallon). Be sure to read the label to determine application rates for specific products.

[3] Spray adjuvants, including surfactants, are supplemental products added to a spray mixture to improve the performance of the chemical. Please refer to the product labels for more information. AMS = ammonium sulfate, COC = Crop Oil Concentrate, MSO = Methylated Seed Oil, NIS = Nonionic Surfactant, v/v = volume/volume

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