W1336

Johnsongrass in Forage Systems: Control, Risks, and Benefits

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Classification and Identification

Johnsongrass (*Sorghum halepense* L. Pers.) is a warm-season perennial grass that grows tall and upright (Fig. 1), often reaching heights of 6 to 8 feet. It spreads through seeds and creeping underground rhizomes. The leaves are long and smooth and have a distinct light midvein (Fig. 1). Leaves appear maroon near the base, while stems may be pink or rusty near the soil (Fig. 2). An important characteristic is the large, thick white rhizomes (Fig. 2), which help distinguish it from other grasses (McWhorter, 1971; Smith & Sellers, 2012). Capturing clear pictures and consulting your county Extension agent ensures accurate identification and guidance before using any control methods. Luckily, there are now various web-based and mobile-friendly apps like PictureThis®, iNaturalist® and Google Lens® to assist with fast and accurate weed identification.

Figure 1: *Johnsongrass tussock and leaf detail (Photos: Roger Furlan)*

Figure 2: *Johnsongrass root system (Photo: Roger Furlan)*

Weed Potential

Johnsongrass is one of the most troublesome weeds in Tennessee, most commonly present in soybean, corn, cotton, hayfields and pastures. Some cases of resistance to glyphosate, fluaziflop-butyl and quizaloflop-butyl have been reported on row crops. Competition from johnsongrass may reduce yield in grain crops and complicate the harvesting process. Johnsongrass can compete with other forage grasses, negatively impacting the production of the desired grass. Since Johnsongrass is a warm-season grass that thrives in summer, it becomes more challenging to control when cool-season grasses like tall fescue and orchardgrass go dormant. Due to its extended growing season and competitiveness against cool-season grasses, johnsongrass is often a challenge in second-cutting hay in Tennessee.

Toxicity

Though livestock may graze johnsongrass, in certain circumstances, it can be toxic to them. Under certain stressing conditions, johnsongrass can be a potential source of nitrate and prussic acid poisoning.

Nitrates can accumulate in several grasses, with bermudagrass, corn, sorghum and johnsongrass being the most affected under stress conditions like drought, herbicide injury or nitrogen fertilization. In Tennessee, the primary cause of nitrate buildup is spring fertilization, followed by summer drought. Nitrates do not dissipate after harvesting or baling. If your forage was exposed to one of these stressful conditions, consider testing. For more information on nitrates, reference UT Extension Publication W1314 Nitrate Toxicity in Forages. After consumption, nitrates are converted in the cattle rumen to nitrites, which bind to red blood cells and reduce their ability to transport oxygen. This can lead to breathing difficulty, weakness, incoordination, dark brown-colored blood and, in severe cases, death to livestock within hours (Strickland et al., 2013).

Prussic acid (cyanide) can be produced by johnsongrass, sorghums, sudangrass and sorghum-sudangrass hybrids after frost, posing a deadly risk to grazing animals. To prevent poisoning, livestock should not graze johnsongrass for at least two weeks following a freezing event (Mullenix et al., 2019).

Forage Potential

The same characteristics that make johnsongrass a troublesome weed also can make it a valuable forage for cattle: competitiveness, persistence, and high-forage accumulation even in limited-fertility soils. Overall, it can yield 2 to 5 tons per acre, with crude protein levels ranging from 10 percent to 14 percent and total digestible nutrients reaching up to 60 percent In the vegetative stage, cattle readily graze johnsongrass, but it should be avoided for horses due to the risk of equine cystitis (Mullenix et al., 2019). For optimal grazing management, a stubble height of 6 to 8 inches should be maintained. Like other tall-growing grasses such as indiangrass, switchgrass and big bluestem, johnsongrass is highly sensitive to close grazing (Rocateli & Manuchehri, 2017).

Control Methods

Effective weed management is not about relying on a single method but about combining multiple strategies in a thoughtful and coordinated way. This approach, known as Integrated Weed Management, uses a blend of cultural, mechanical and chemical methods to sustainably reduce weed pressure over time. By understanding how different techniques work together, producers can reduce herbicide resistance and minimize negative environmental impacts.

Cultural Control: Well-established cool-season pastures, with an adequate fertility program and not overgrazed (stubble height should be at least 3-4 inches), will be more resilient and will present fewer warm-season weeds such as johnsongrass, foxtail and pigweeds (Furlan & Pedreira, 2024).

Mechanical control: If renovating the pasture, tillage may spread johnsongrass rhizomes and worsen the infestation. Repeated mowing (two or three times during the summer) or grazing close to the ground (3-4 inches stubble height) can help control Johnsongrass and upright-growing plants. For the best results, mow just before the johnsongrass reaches the seed head stage (Furlan & Pedreira, 2024).

Chemical control: Tall fescue pastures have fewer chemical control options than bermudagrass pastures, making it essential to integrate cultural and mechanical control methods.

- **In small patches of the pasture:** Spot-spray with 1 qt/ac of glyphosate when johnsongrass is heading (second half of the summer).
- **Broadcast applications on established fescue pastures:** Rope wick applications of glyphosate are recommended to control johnsongrass in tall fescue pastures. Use a 33 percent to 75 percent glyphosate solution and make applications in mid- to late-summer when tall fescue is dormant and the johnsongrass is actively growing. It is recommended to wait until johnsongrass is at least 6 inches taller than the fescue before making a rope wick application.
- **Broadcast applications on established bermudagrass pastures:**
    - Spray 1.25 oz/ac of Outrider 75WDG (sulfosulfuron) to control johnsongrass. Always associate with non-ionic surfactant at a rate of 0.25% v/v (1 qt./100 gal. of spray mix). Applications at this rate have performed well on 18-24 inches of johnsongrass, although temporary bermudagrass stunting may occur. Do not harvest for hay for 14 days.
    - Pastora 71.2 WG (nicosulfuron + metsulfuron) also is an option to control the weed on Bermuda pastures only; it may slightly harm Bermuda but will kill fescue and orchardgrass. Spray 1-1.5 oz/ac overtop to control johnsongrass. Always add non-ionic surfactant at 0.25% v/v (1 qt./100 gal. of spray mix). Noticeable forage growth reduction and discoloration following application usually occur, but bermudagrass will recover. Injury may be reduced by applying when bermudagrass has less than 2 inches of new growth following green-up or within seven days following hay harvest. Pastora has no grazing or hay-cutting restrictions.
- Rope wick is an herbicide application technique that uses capillary action to transfer the herbicide solution from a reservoir to the targeted weeds. The applicator comprises soft-woven nylon ropes that are inserted through holes in a PVC pipe filled with herbicide. To enable the herbicide to wick up the rope, one end of each rope is soaked in the solution, and the other end extends out. As the applicator moves through the field at low speeds (under 5 mph), taller weeds touch the herbicide-soaked ropes. This targets only the weeds growing above the pasture canopy (Hoette et al., 1982). The rope wick is a great option for treating orchardgrass and timothy fields where other selective herbicide options for johnsongrass aren't available The most commonly recommended mixture used in a rope wick applicator is one part herbicide plus two parts water. This method allows for efficient, precise weed control without damaging the surrounding crops.

Always check the herbicide label for recommendations and restrictions. For detailed information on appropriate herbicides and rates for pastures and hayfields, see UT Extension Publication PB1580 Weed Control Manual for Tennessee. Ensure that the equipment is accurately calibrated and that environmental conditions are optimal. For more information on spray calibration, refer to the UT Extension Publication W315 A Simple Method to Calibrate Sprayers.

Summary

Johnsongrass can be used to feed cattle when it is not exposed to stress conditions that can cause nitrates and prussic acid to build up. If the grass is under drought stress or has been fertilized, it's important to test the forage for safety before grazing. Since there are limited chemical options for controlling johnsongrass in tall fescue and orchardgrass fields, proper fertilization and grazing management become even more important. By maintaining good soil fertility and avoiding overgrazing, you can improve pasture resilience and help the grasses better compete against weeds.

Online Resources

UT Extension Publication W315: A Simple Method to Calibrate Sprayers, **tiny.utk.edu/dAKnw**

UT Extension Publication PB1580: Weed Control Manual for Tennessee, **tiny.utk.edu/spRPK**

UT Extension Publication W1314: Nitrate Toxicity in Forages, **tiny.utk.edu/nitrates**

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