

This WEED REPORT does not constitute a formal recommendation. When using herbicides always read the label, and when in doubt consult your farm advisor or county agent.

This WEED REPORT is an excerpt from the book *Weed Control in Natural Areas in the Western United States* and is available wholesale through the UC Weed Research & Information Center (wric.ucdavis.edu) or retail through the Western Society of Weed Science (wsweedscience.org) or the California Invasive Species Council (cal-ipc.org).

Sorghum halepense (L.) Pers.

Johnsongrass

Family: Poaceae

Range: Nearly all contiguous states, including all western states.

Habitat: Disturbed sites, roadsides, fields, agronomic and vegetable crops. Grow best on fertile, moist, well-drained soils in warm temperate to sub-tropical regions where some warm-season moisture is available. Also found in orchards, vineyards, cotton fields, and ditchbanks. Occasionally in undisturbed wildlands, particularly riparian areas.

Origin: Native to the Mediterranean region.

Impact: Johnsongrass invades riverbank communities and disturbed sites, particularly fallow fields and forest edges, where it crowds out native species and slows succession. It quickly dominates the herbaceous flora and reduces plant diversity. Johnsongrass grows rapidly, is highly competitive with other plants, and can be difficult to control. In addition, it can hybridize with commercial sorghum cultivars. Healthy plants can provide good forage for livestock, but the foliage can produce toxic amounts of hydrocyanic acid when exposed to frost, stressed by drought, or damaged by trampling or herbicides. Under these conditions, the foliage can be poisonous to livestock when ingested. Young shoots and second growth are typically more dangerous than uncut mature plants because cyanide levels are higher. Dried plant material does not lose its toxicity, but well-cured hay from healthy mature plants is usually safe. Under certain conditions, plants may accumulate toxic levels of nitrates. Weedy sorghums are subject to various bacterial, fungal, and nematode infections. They also serve as alternate hosts for the sorghum midge (*Contarinia sorghicola*) and the viruses that cause sugarcane mosaic virus, maize chlorotic dwarf virus, and corn stunt disease.

Western states listed as Noxious Weed: California, Colorado, Idaho, Nevada, Oregon, South Dakota, Utah, Washington



Johnsongrass is a coarse, typically tufted perennial grass to 6 ft tall with tillers from the crown. The stems are erect and unbranched and the leaves are rolled in the bud, flat, glabrous to sparsely hairy, especially near the ligules. The leaf margins are scabrous with a conspicuously whitish midvein. The ligules are membranous, 3 to 6 mm long, with a fringe of hairs at the top. Johnsongrass has vigorous, coarse rhizomes up to 0.5 inch thick and 6 ft long. The rhizomes are whitish with large brown or purplish brown scales at the nodes, often rooting at the nodes. The seedlings resemble young corn seedlings, but can be distinguished by carefully removing young seedlings from the soil and examining the attached seed.

Inflorescences are open pyramid-shaped panicles 4 to 20 inches long. They are initially pale green or greenish-violet, but often mature to a dark reddish- or purplish-brown. Some panicles shed spikelets (shatter) at maturity. The lemma has awns that are bent, twisted, early deciduous. Johnsongrass reproduces both by seed and vegetatively from rhizomes. The seeds primarily fall near the parent plant. Some seeds survive ingestion by birds and mammals. Dormant seed can survive for at least 6 years under field conditions, and it has been estimated that some seed may remain viable for up to 15 years.

NON-CHEMICAL CONTROL

Mechanical
(pulling, cutting,
disking)

Hand pulling is considered too slow and not an effective control method unless all rhizomes are removed or new sprouts are controlled. Large mature plants are almost impossible to pull by hand. Rhizomes break easily and are often left in the soil where they will resprout. Best results are obtained in early spring when

	<p>soil is moist and rhizomes are least likely to break.</p> <p>Johnsongrass does not tolerate repeated, close mowing. Such a mowing regime can kill johnsongrass seedlings, prevent seed production, and reduce rhizome growth and regrowth of shoots. In most cases, however, mowing does not kill or eliminate established plants.</p> <p>Repeated tillage can be an effective control strategy. Smaller rhizome fragments are brought to the soil surface, where they are susceptible to desiccation and freezing winter temperatures. Shoots developing from these rhizome fragments are less vigorous. If cultivation is not repeated, the infestation can spread, since broken rhizome segments can produce roots and shoots. Repeated tillage (e.g. six times at 2-week intervals during the growing season) prevents rhizome development and reduces johnsongrass populations. Tilling can be used on some sites such as bottomlands and old fields. Shallow plowing helps control johnsongrass by breaking up rhizome systems, exposing rhizomes to the sun or killing frosts, and depleting carbohydrate reserves. First plowing is in spring (May), followed by similar plowings every 3 to 6 weeks.</p>
Cultural	<p>Grazing and burning are not effective for the control of johnsongrass.</p> <p>Prevent johnsongrass from becoming established in new areas. This can be accomplished by preventing the production of seed, the spread of rhizomes from infested to uninfested areas, and by controlling seedlings originating from shattered seed.</p>
Biological	<p>No biological control agents are currently available for the management of johnsongrass.</p>

CHEMICAL CONTROL

The following specific use information is based on published papers and reports by researchers and land managers. Other trade names may be available, and other compounds also are labeled for this weed. Directions for use may vary between brands; see label before use. Herbicides are listed by mode of action and then alphabetically. The order of herbicide listing is not reflective of the order of efficacy or preference.

LIPID SYNTHESIS INHIBITORS	
<p>Clethodim <i>Select, Envoy</i></p>	<p>Rate: 9 to 32 oz product (<i>Envoy</i>)/acre (2.25 to 8 oz a.i./acre)</p> <p>Timing: Postemergence, to rapidly growing johnsongrass; make the first application when rhizome johnsongrass is 12 to 24 inches tall and the second, if necessary, when it is 6 to 18 inches tall.</p> <p>Remarks: May require several applications with proper timing to insure effectiveness. Note that <i>Envoy</i> formulation is 1 lb a.i./gallon, <i>Select</i> is 2 lb a.i./gallon.</p>
<p>Fluazifop <i>Fusilade</i></p>	<p>Rate: 1 to 1.5 pt product/acre (4 to 6 oz a.e./acre)</p> <p>Timing: Postemergence, to rapidly growing johnsongrass 8 to 18 inches tall but before boot stage.</p> <p>Remarks: Apply with 1% v/v crop oil concentrate or 0.25% v/v non-ionic surfactant. Fluazifop acts very slowly, taking 2 to 4 weeks to show effectiveness. Do not apply to stressed grasses. If weed regrows, repeat application at 4 to 6 oz a.e./acre. Maximum use rate per year varies by state.</p>
<p>Sethoxydim <i>Poast</i></p>	<p>Rate: 1.5 to 2.5 pt product/acre (4.5 to 7.5 oz a.e./acre)</p> <p>Timing: Postemergence, to rapidly growing johnsongrass; make the first application at 1.5 to 2.5 pt product/acre when johnsongrass is 10 inches tall and the second application, if necessary, at 1 to 1.5 pt product/acre when plants are 8 inches tall.</p> <p>Remarks: Apply with 2 pt/acre crop oil concentrate. Sethoxydim acts very slowly, taking 2 to 4 weeks to show effectiveness. Do not apply to stressed grasses.</p>
AROMATIC AMINO ACID INHIBITORS	
<p>Glyphosate <i>Roundup, Accord XRT II, and others</i></p>	<p>Rate: 2 to 3 qt product (<i>Roundup ProMax</i>)/acre (2.25 to 3.375 lb a.e./acre)</p> <p>Timing: Postemergence, to plants that are growing rapidly and about 18 inches tall to the early flowering stage. Fall applications are also effective before seed production.</p> <p>Remarks: Glyphosate is a nonselective herbicide with no soil activity. Multiple applications will be required. After mowing, glyphosate can be applied at 2 lb product/acre within 2 to 3 weeks. Spot control is not effective unless surrounding seed sources are also eliminated. Control is not as effective when applied to moisture-stressed plants.</p>
BRANCHED-CHAIN AMINO ACID INHIBITORS	
<p>Imazapic</p>	<p>Rate: 12 oz product/acre (3 oz a.e./acre)</p>

<i>Plateau</i>	<p>Timing: Postemergence at the late-boot or early bloom stage.</p> <p>Remarks: Use a methylated seed oil at 1 qt/acre. Do not exceed 25 gal/acre spray volume. Imazapic is not registered for use in California.</p>
Imazapic + glyphosate <i>Journey</i>	<p>Rate: 21 to 32 oz product/acre</p> <p>Timing: Postemergence when grass is 18 to 24 inches tall.</p> <p>Remarks: Add a suitable surfactant to the spray mix. Not registered for use in California.</p>
Imazapyr <i>Arsenal, Habitat, Stalker, Chopper, Polaris</i>	<p>Rate: 2 to 3 pt product (<i>Habitat</i>)/acre (8 to 12 oz a.e./acre)</p> <p>Timing: Postemergence, to perennial johnsongrass. Residual activity may control emerging seedlings.</p> <p>Remarks: Untreated plants can occasionally be affected by the uptake of imazapyr through movement into the topsoil.</p>
Propoxycarbazone- sodium <i>Canter R+P</i>	<p>Rate: 0.9 to 1.2 oz product/acre (0.63 to 0.84 oz a.i./acre)</p> <p>Timing: Postemergence from the 2-leaf to 2-tiller stage when plants are growing rapidly.</p> <p>Remarks: Propoxycarbazone is a broad-spectrum herbicide that will control many species, and will give partial control of johnsongrass. Perennial grass species vary in tolerance. A non-ionic surfactant should be added at 0.25 to 0.5% v/v solution.</p>
Rimsulfuron <i>Matrix</i>	<p>Rate: 3 to 4 oz product/acre (0.75 to 1 oz a.i./acre)</p> <p>Timing: Postemergence, to seedlings.</p> <p>Remarks: Rimsulfuron gives good to excellent control, depending on the size of the plant. It controls several annual grasses and broadleaves. Perennial grasses are tolerant to fall applications when established and grown under dryland conditions. Application to rapidly growing or irrigated perennial grasses may result in injury or death of the crop. It provides soil residual control in cool climates but degrades rapidly under warm conditions. Rimsulfuron will not control summer annual weeds when applied in fall or spring. Add a surfactant when applying postemergence.</p>
Sulfosulfuron <i>Outrider</i>	<p>Rate: 0.75 to 2 oz product/acre (0.56 to 1.5 oz a.i./acre)</p> <p>Timing: Postemergence in spring or fall.</p> <p>Remarks: Sulfosulfuron is a broad-spectrum herbicide that may damage other non-target plants. For best weed control do not mow or graze 2 weeks before or after treatment. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.</p>

RECOMMENDED CITATION: DiTomaso, J.M., G.B. Kyser et al. 2013. *Weed Control in Natural Areas in the Western United States*. Weed Research and Information Center, University of California. 544 pp.