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VEGETATION MANAGEMENT GUIDELINE

Johnson grass (*Sorghum halepense* (L.) Pers.)

SPECIES CHARACTER

DESCRIPTION

Johnson grass is a robust perennial with fleshy rhizomes to 1 cm in diameter. It grows in dense clumps or nearly solid stands and can reach 8 feet (2.4 meters) in height. Leaves are smooth, 15-50 cm (6-20 inches) long and have a white mid-vein. Stems are pink to rusty red near the base. Flowering stems are usually unbranched and often have basal adventitious prop roots. Panicles are large, up to 50 cm long, loosely branched, purplish, and hairy. Spikelets occur in pairs or threes and each has a conspicuous awn 1-1.5 cm (1/2-3/4 inch) long. Seeds are reddish-brown to shiny black and nearly 0.3 cm (1/8 inch) long. Seeds can be dispersed by wind, water, livestock, birds and machinery. Johnson grass should be accurately identified before attempting any control measures. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable individual or by consulting plant identification manuals or keys.

SIMILAR SPECIES

Sorghum halepense with its white leaf vein, wide leaves, and reddish seedhead is distinguished from (1) eastern gamagrass (*Tripsacum dactyloides*), which has flowers in a spike rather than a loose panicle; (2) switchgrass (*Panicum virgatum*), which has no white vein, a loose greenish yellow flower head, and a characteristic tuft of hairs found in the ligule extending onto the upper surface of the leaf blade; 3) big bluestem (*Andropogon gerardii*) whose seed heads are usually divide into three branches and leaves are narrower and usually without a prominent vein; and 4) Indiangrass (*Sorghastrum nutans*) which has plume-like seed heads and a ligule that extends upward to form a fingernail-like projection. Vigorous plants of Indiangrass and switchgrass occasionally develop a whitened leaf midrib, similar to Johnson grass.

DISTRIBUTION

Originally native to the Mediterranean region and Syria, this grass is now present around the world and is considered as a serious problem in 53 countries in all warm-temperate regions of the world. It is widely distributed in Central and Northern South America. It is found throughout the United States and has moved northward into Canada. In Illinois, it is particularly common in cultivated river bottoms in the southern 1/4 of the State, especially along the Mississippi, Ohio, and Cache River bottoms.

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HABITAT

This species occurs in crop fields, pastures, abandoned fields, rights-of-way, forest edges, roadsides and along streambanks. It thrives in open, disturbed, rich, bottom ground, particularly in

cultivated fields.

LIFE HISTORY

Johnson grass is a very aggressive, perennial grass. It occurs in dense clumps that spread by seed and rhizomes to form nearly pure stands. Rhizomes can grow up to 90 m in a single growing season. The leaves emerge in late spring. Flower and seed production begin in early summer and continue until frost. Stems and leaves die back after the first frost, but the dead litter often covers the ground all winter. Rhizome cuttings commonly form new plants, making it very difficult to eradicate. Seeds can remain viable in the seedbank for several years with 50% still able to germinate after 5 years. Herbicide-resistant strains of Johnson grass have been reported.

EFFECTS UPON NATURAL AREAS

Johnson grass 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, reduces plant diversity and is unsightly. It occurs in disturbed parts of several natural areas such as Lower Cache, Horseshoe Lake, and Robeson Hills. This grass is a serious potential threat in right-of-way prairies and old fields where natural community restoration is desired.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN NATURAL COMMUNITIES OF HIGH QUALITY

Initial effort in areas of heavy infestation

Johnson grass does not heavily infest areas of high natural quality except for the naturally disturbed environment along river banks in southern Illinois where it is difficult to control selectively. Seed panicles may be cut and removed from the area where practical. Dense patches can be controlled by spraying the foliage with a 1.0% active ingredient solution of glyphosate herbicide such as Roundup Pro or Roundup Ultra, which have the same formulation, during June, just prior to seed maturity. Care should be taken to avoid contacting non-target plants, since glyphosate is a non-selective herbicide. **Do not spray so heavily that herbicide drips off the target species.** Treatment should encompass all of the infested area as Johnson grass will rapidly re-infest the site from untreated areas.

In areas where Johnson grass has overtopped native vegetation or is interspersed with highly valued native species a rope wick or hand held wick applicator may be used to wipe herbicide on target plants. A 33.0% solution Roundup Pro is recommended.

Sethoxydim (Poast, Poast Plus) and Clethodim (Envoy) and Fusion (Fluazifop-P-butyl + Fenoxaprop-P-ethyl) are grass specific herbicides that usually do not effect sedges or broadleaf forbs, but only provide suppression of Johnson grass. Poast and Poast Plus should be applied as 0.3% active ingredient solution, Envoy as a 0.1% active ingredient solution and Fusion as a 0.06% active ingredient solution. Application of these herbicides may prevent seed production.

All herbicides should be applied while backing away from the area to avoid walking through wet herbicide. By law, herbicides may only be applied as per label

instructions and by licensed herbicide applicators or operators when working on public properties.

Frequent monitoring and re-treatment will be needed to ensure eradication.

Effort in areas of light infestation

Clumps and individual plants may be hand pulled during June, just after a rain when the ground is soft. If only a small area is involved, all below ground plant parts, including broken stems and roots, should be dug up and removed from the area. It may be more effective to spot-treat the individual plants with herbicide than to pull them. Large clumps can be sprayed with 1.0% active ingredient solution of Roundup Pro using a hand sprayer or backpack sprayer. Herbicide treatment may need to be repeated for several years to ensure control.

Maintenance control

The preferred treatment is hand pulling or spot treatment of individual plants immediately upon discovery with a 1.0% active ingredient solution of Roundup Pro. If pulled, all plant parts, including rhizomes, must be removed. It may be necessary to hand pull a population several times to obtain control. Surrounding seed sources should be eliminated where possible to prevent continual re-invasion. Repeated mowing or hand-cutting can be effective in preventing seed production and may reduce the vigor of the plant, but will not eradicate it.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Initial effort in areas of heavy infestation

All treatments applicable to high quality areas may be employed on buffer and disturbed sites.

Spraying 1.0% active ingredient solution of Roundup Pro on foliage using a high pressure sprayer provides effective control for large infestations.

Repeated and close mowing stunts Johnson grass seedlings, prevents seed production and reduces rhizome growth and regrowth of shoots. Mowing equipment should be inspected, and cleaned if necessary, to prevent the spread of Johnson grass seed.

In heavily infested areas, livestock may be used to reduce vigor of Johnson grass by grazing. However, care must be taken as cattle may be poisoned by feeding exclusively on Johnson grass during certain times of the year. Grazing can result in excessive trampling of native vegetation, damage to non-target species and soil compaction. Seeds of Johnson grass are able to survive passage through the gut of animals and may be transported by the coats of animals. Grazing may also increase the potential for introducing other exotic plants into the area.

At sites where natural quality is very low, control through tillage practices may be possible. Cultivation when the grass is about 36 cm tall prevents the plant from developing rhizomes and seeds. Repeated tillage (e.g. 6 times at 2- week intervals during the growing season) may effectively reduce rhizome development and Johnson grass populations. Early season or a single tillage serves only to encourage rhizome growth and can increase the size of the infestation by spreading pieces of the rhizomes. This method can be labor-intensive, and therefore cost prohibitive, and may not practical in

many areas because of terrain and erosion hazard. It is seldom effective by itself and allows other weedy species to invade. It may also destroy populations of native species.

Effort in areas of light infestation

Cutting and removal of seed heads during early July and then spot application of 1.0% active ingredient solution Roundup Pro to the foliage is usually effective if continued for 3-4 years.

Maintenance control

Preferred treatment is same as given above for high-quality areas.

BIOLOGICAL CONTROL

No biological controls are known that are feasible in natural areas.

FAILED OR INEFFECTIVE PRACTICES

Hand control is too slow and not practical in large areas where infestations are heavy. Rhizomes break easily and are often left in the ground. Large mature plants are almost impossible to pull by hand.

Single herbicide applications or treatment efforts rarely eradicate Johnson grass from an area.

Mowing may suppress, but usually does not kill or eradicate established plants.

More research is needed on the usefulness of fire. Spring burns may encourage regrowth.

Manipulation of water levels resulting in extended inundation may not be practical and could have negative impacts on non-target species.

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