

GUIDE

Published by the University of Missouri - Columbia Extension Division

Johnsongrass Control

*Harold Kerr, Joseph M. Scott, L. E. Anderson, and O. Hale Fletchall
Department of Agronomy, College of Agriculture*

An important forage in various parts of the South, johnsongrass is a major weed problem along the Missouri River and several of its tributaries. From Atchison County in the northwest corner of the state through the Bootheel, thousands of acres of fertile bottomland have become infested to the extent that cropping has been seriously affected.

Originally introduced as a forage crop in South Carolina and later in Alabama, johnsongrass has spread north to Michigan and west to California and now is a major weed problem wherever it has become established. Several states have legislation requiring eradication or control programs, but johnsongrass shows little respect for natural or legal boundaries and continues to spread to new areas.

Johnsongrass is a controversial species: it is a cultivated forage in some states and a difficult-to-control, noxious weed in others. As a forage, johnsongrass yields well under good management and is palatable to livestock. Under favorable conditions, it yields from three to five tons per acre under dryland farming and up to 12 tons under irrigation. When properly harvested and cured, it makes excellent hay that compares well with sudangrass and timothy in nutritive value.

Johnsongrass is not a good permanent pasture grass because heavy grazing weakens and thins the stand, enabling weeds and inferior grasses to become established. Repeated mowing has a similar effect.

On the whole, johnsongrass is difficult to maintain as a desired crop and difficult to eradicate as a weed.

Plant Characteristics

Johnsongrass is well adapted to compete with crop plants and to spread to new areas despite intensive efforts to control it. An upright perennial, it often grows six to eight feet tall (Figure 1). It has wide leaves with thickened whitish midribs; its panicles (seed heads) are open, and the many branches support thousands of spikelets from which seeds are readily shattered.

In addition to a typical fibrous root system, johnsongrass has extensive rhizome development that enables it to persist as a perennial. (Rhizomes are modified underground stems.) Rhizomes develop rapidly under seedlings or established plants (Figure 2).

Propagation

Its extraordinary ability to reproduce and spread to uninfested areas is what makes johnsongrass a menacing weed. Extensive underground rhizomes (Figure 3) spread in all directions from the original plant and send up shoots which develop into new plants.

A johnsongrass plant may produce more than 80,000 seeds



Figure 1. This three-month-old plant originated from a single seed that germinated in late May.

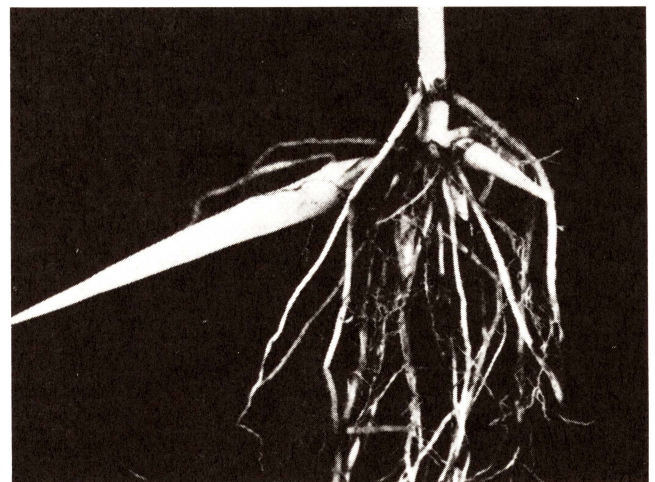


Figure 2. Rhizomes develop rapidly in seedlings.

in a single growing season. Seeds shatter easily and fall to the ground beneath the plants that produced them. Instead of germinating uniformly, seeds can remain dormant and produce plants several years later.

Johnsongrass generally grows in fertile bottomlands along creek and river banks, where shattered seeds can be carried downstream and deposited in new locations. When flood waters go over the banks, seeds go along. Irrigation ditch banks also are often overgrown with johnsongrass, and shattered seed is carried by the water. In a new location johnsongrass spreads rapidly and soon becomes a serious problem.

Agricultural seed, hay, and various livestock feeds sometimes become contaminated with johnsongrass seed. Also, watermelons trucked from the South are often bedded in johnsongrass hay, which is swept out at destinations.

Cultivation intended to control johnsongrass may actually help it spread. Breaking up rhizomes by tillage and dragging segments to new locations in the field may result in a better stand. Tillage is a common practice in the South where johnsongrass is used extensively for livestock pasture.

Thus, eliminating johnsongrass requires a method to control seedlings and to eradicate the established stand.

Interfertility With Sorghums

Plant breeders, seedsmen, and growers often observe off-type plants or "rogues" in fields of hybrid grain sorghum. Common rogues are the tall outcrosses to sudangrass, johnsongrass, and other sorghum types. Sorghum outcrosses with johnsongrass as the male parent often have rhizomes resembling those of johnsongrass. Johnsongrass-grain sorghum hybrids can become a serious weed threat.

Cultural Control

Preventing johnsongrass from becoming established in new areas is the best control method available, since the weed spreads in so many different ways.

Johnsongrass control programs should:

- kill or weaken established plants and their underground rhizome systems,
- control seedlings originating from shattered seed, and
- prevent production of seed and its spread to new areas.

These objectives are closely related and are equally important to the success or failure of a control program. Control methods should be carried out thoroughly and persistently and as often as necessary.

Control programs may vary from suppressing johnsongrass to completely eradicating it. By suppressing the weed, a farmer "lives with it" and grows crops in the infested areas. In limited infestations, killing the weed and preventing seed production with chemicals is possible and desirable. The critical time to kill johnsongrass is while the weed is becoming established and before it has spread over the entire field. At this early stage a farmer should aim for complete eradication.

Frequently, johnsongrass infested areas can be so extensive that chemicals alone (Figure 4) may be too costly. Then, the objective should be to suppress it so certain crops can be grown. Postponing any control program only makes the job more difficult and costly.

Growing early maturing crops, plowing immediately after harvest, and tilling as needed are common methods to control johnsongrass in cultivated areas. Winter wheat works well with these methods since it is sown during the fall, after johnsongrass has completed its growing season. Also, wheat is harvested in early summer, before johnsongrass makes its maximum growth. Intensive tillage between harvest and



Figure 3. Rhizomes are underground stems capable of producing new plants.

sowing of wheat will greatly reduce johnsongrass stands and prevent seed production.

Other small grain crops that are harvested early can also be grown successfully in fields infested with johnsongrass. Once established, alfalfa competes well with johnsongrass for a limited time, but the alfalfa will gradually weaken. Repeated mowing of an alfalfa-johnsongrass mixture will prevent johnsongrass from producing seed and will inhibit rhizome development.

Intense grazing can be used to reduce a stand of johnsongrass. If grazed closely for at least two years, the plants become weak and stunted. Also, rhizomes become concentrated near the soil surface. Then, plowing in late fall, where possible, exposes rhizomes to low winter temperatures and reduces the stand considerably.

For infested areas that cannot be tilled or sprayed, intensive grazing probably is the best control. Although continuous grazing may not completely eradicate johnsongrass, it prevents or reduces seed production. Repeated mowing has an effect similar to intensive grazing.

Chemical Control

Non-Cropland. *Soil Sterilants* (Figure 5) are recommended for use only on those areas where bare soil and soil erosion are not objectionable and where runoff water from the treated area will not endanger desirable plants.

Soil sterilants are particularly well adapted for spot treatment. However, no herbicide will consistently provide 100 percent control: thus, follow-up treatments to control escaped plants and later emerging seedlings should be an integral part of any soil sterilant program. There are several sterilants (see UMC Guide 4901) that will effectively control johnsongrass.

Dowpon (dalapon) applied at a rate of 15 to 20 pounds per acre to rapidly growing johnsongrass will result in a satisfac-



Figure 4. Cropland was abandoned because of johnsongrass.

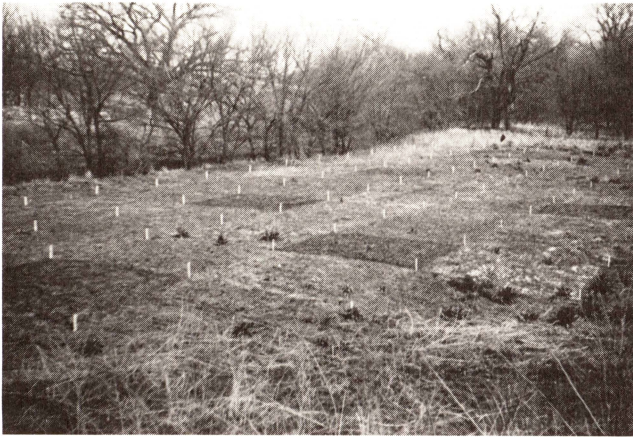


Figure 5. Various soil sterilants were applied before johnsongrass emerged.

tory kill. Apply when plants are from 16 to 20 inches in height in a sufficient water carrier to give thorough coverage. Addition of a surfactant will improve foliage wetting and may enhance the herbicide performance. Use according to label instructions. Since johnsongrass is a persistent perennial, a repeat application may be needed.

DSMA or *MSMA* are registered for use on non-crop areas but cannot be used on cropland.

Choice between *DSMA* or *MSMA* should be based on price differences since little performance variation has been noted.

A spray program should consist of repeated applications of three to four pounds per acre active *DSMA* or its equivalent of *MSMA* (2.6 to 3.5 pounds per acre) in a water solution containing one quarter of one percent (one quart per 100 gallons of spray mixture) of reliable surfactant. The amount of carrier used in spraying these herbicides is not as important as uniform coverage of plants. Commercial equipment normally requires about 50 gallons of water per acre to get uniform coverage.

The first herbicide application of the season should be made when johnsongrass is in the boot stage. Spraying should be repeated when the regrowth again reaches the boot stage. In cases where the previous spraying did not give top-kill (usually under low temperature conditions), repeat the application when dying back has stopped and plants begin to recover.

DSMA and *MSMA* are highly responsive to temperatures. Air temperatures above 70 F are required for johnsongrass control, but optimum control is obtained when air tempera-



Figure 6. Bare area was treated with a soil sterilant.

tures are above 85 F.

Roundup (Glyphosate) is a relatively new herbicide that effectively controls johnsongrass. Applied to the foliage, it translocates throughout the plant, including the root and rhizome systems. Apply two to three quarts per acre. For best results, apply when plants approach early seed head development but before leaves start to turn brown. Check label for suggested volumes of water carrier.

Cropland. *Dowpon M* can be used for control of established johnsongrass in corn, cotton, and soybeans. Using *Dowpon M* involves a spring application after johnsongrass has emerged to a height of six to 12 inches (the 12-inch stage is preferable), followed by tillage and seedbed preparation. Emergence will be more rapid and uniform in an undisturbed soil; thus, tillage operations should be delayed until after *Dowpon* application.

Apply five to seven pounds of *Dowpon M* per acre to emerged johnsongrass. Only a short time is required for the chemical to translocate from the treated foliage to underground roots and rhizomes. Such treatment should result in a 75 percent kill of established plants. Plow three to five days after the *Dowpon M* application and prepare seedbed. Wait five days before planting the crop. Cultivate as necessary during the growing season.

During a cold spring, johnsongrass emerges late and grows slowly. Therefore, soybeans may have an advantage over corn because of the late planting date necessitated by the herbicide application for johnsongrass control.

Where a *Dowpon M* pre-planting program is used, make every effort to destroy johnsongrass seedlings that emerge after the crop has been planted. If allowed to grow, seedlings will begin to develop rhizomes (Figure 2) within a period of three weeks.

In addition to mechanical control, several herbicides that effectively control johnsongrass seedlings are available. The general program for control of established johnsongrass is similar for the three row crops. However, herbicides to control escaped perennials and seedlings will vary.

Trifluralin (*Treflan 2x rate*) is registered for control of established johnsongrass. Application should be made for at least two consecutive years at twice the rate recommended for spring application for general use (except do not exceed two pounds/acre). Rate of trifluralin should be based on soil type. Soybeans should not be planted deeper than two inches. Planting should be delayed until stress from adverse early season weather is no longer a hazard. Control of johnsongrass is improved by intensive tillage to break the rhizomes into small pieces before incorporation of trifluralin.

Disk four to six inches deep in two directions. Repeated tillage during the crop season will contribute to control.

Do not expect acceptable control with only one year of trifluralin at the 2x rate. Crop injury may occur, but the loss normally will be less than the loss from johnsongrass competition. Follow soybean crops, given this double rate of trifluralin, with only those crops for which trifluralin has been registered as a pre-plant treatment. Apply up to 10 weeks before planting or immediately before soybeans are planted.

Profluralin (Tolban) for established johnsongrass control requires the same seedbed preparation as Treflan. Rates:

sandy loam	3 pts./A
silt loam	4 pts./A
clay loam	6 pts./A

Do not use on muck or peat.

Roundup (Glyphosate) is registered for spot treatment of established johnsongrass in barley, oats, corn, sorghum, soybeans, and wheat. Application should be made before heading of small grains, initial pod setting on soybeans, or silking of corn. Apply according to rates on the label. Crop plants in the treated area will be killed along with the johnsongrass. Users must have the label in possession at the time of application.

Seedling Control in Row Crops. Several herbicides that effectively control johnsongrass seedlings in row crops are available. They are:

- Corn: Sutan⁺, Eradicane, Lasso, Dual 6E, Prowl, and Ramrod.
- Soybeans: Treflan, Tolban, Cobex, Basalin, Prowl, and Vernam.
- Cotton: Treflan, Cobex, Basalin, Prowl, Tolban, DSMA, and MSMA.

For detailed information on use of the above chemicals for seedling johnsongrass control, see the following agricultural guides:

- 4136, *Recommendations for Chemical Weed Control in Corn*
- 4236, *Recommendations for Chemical Weed Control in Cotton*
- 4436 and 4437, *Recommendations for Chemical Weed Control in Soybeans, Parts I and II*

No discrimination is intended and no endorsement is implied by the use of brand names.

