Johnsongrass and Shattercane Control

An Integrated Approach

Johnsongrass and shattercane are closely related grass weeds that are troublesome and persistent in row crops, where they reduce yield and quality. The rhizomes of johnsongrass and the dormant seeds of shattercane make these weeds difficult to control. They can be managed with a consistent integrated program combining preventive, cultural, mechanical, and chemical methods.

Johnsongrass is a perennial weed that grows from seeds and overwintering rhizomes. It emerges from rhizomes in mid-May and from seeds in late May. Its smooth leaves have a prominent white mid vein, and young plants resemble corn or sudangrass. The seeds are 3 to 5 mm long, oval (about one-half the size of sorghum seeds), and are generally dark reddish brown, but can be tan or black. The thick rhizomes are cream colored and may be spotted with purple. The plant reaches 2 to 7 feet in height and flowers in late July with a loosely spreading or open, coarse, purplish panicle.

Shattercane, an annual weed resembling forage sorghum or sudangrass, has smooth, waxy leaves and reaches 4 to 8 feet in height at maturity. It does not have rhizomes. The seeds are ovate (egg-shaped), slightly smaller than sorghum seeds, shiny, and black to deep reddish purple at maturity. (Shattercane seed is larger and more rounded than johnsongrass seed and can be seen by carefully removing young seedlings from the soil—the seed remains attached to the base of the young seedling.) The seed head is a loose or open panicle that tends to droop and shatters easily, spreading seeds and causing future weed problems.

An integrated weed management program combines control methods to reduce competition with the crop. The methods may be preventive, cultural, mechanical, or chemical. The goal of an integrated program is to give reliable, effective weed control while minimizing environmental hazards.

PREVENTION

It is less expensive and time-consuming to keep johnsongrass and shattercane out of a field than to control these weeds once they are established. To prevent an infestation, plant only certified weed-free seeds. Control johnsongrass and shattercane in fencerows and noncrop areas to reduce sources of weed seeds. Drive equipment around, rather than through, isolated patches of weeds. To avoid spreading rhizomes, thoroughly clean equipment (especially combines) after working in infested fields, and harvest infested fields last so that seeds will not be transported into other areas.

GENERAL CULTURAL CONTROL

The following cultural practices help crops compete with weeds:

- Follow soil-test recommendations for fertilizer and lime.
- Plant high-yielding varieties adapted to your climate, soil, and field conditions.
- Plant as soon as soil temperatures are optimal, using narrow row spacings and high plant populations.
- Scout fields regularly for weeds, diseases, and insects, and control them when necessary.
- Include in the rotation crops that provide early competition such as alfalfa or small grains.

MECHANICAL CONTROL

Mechanical control methods include hand-pulling, hoeing, mowing, plowing, disking, and cultivating. While hand-pulling and hoeing are useful for controlling individual plants or small weed patches, these methods are too time-consuming and laborious to be economical on a large scale. Mowing or harvesting prevents weed seed production in small grains, pastures, and noncrop areas, but it is not suitable for corn and soybean fields.

Fall plowing, where appropriate, will expose johnsongrass rhizomes to killing temperatures. If fall plowing is not possible, plow in the spring as soon as the soil is workable.

Disking chops johnsongrass rhizomes, making them more susceptible to herbicides. Disk to a 6- to 8-inch depth several times before planting, and use a herbicide program that is effective on johnsongrass. Disking alone can spread rhizome fragments, so be sure to take appropriate follow-up measures.

Cultivation reduces carbohydrate reserves in weeds, making them less competitive. Cultivating controls weeds between crop rows, but does not kill weeds near crop plants. Cultivating two or three times during the first six weeks after planting will keep weeds in check between rows until the canopy is established. Always clean tillage equipment after working in one area and before moving into another.

CHEMICAL CONTROL

Herbicides can be a useful tool in a weed control program when combined with preventive, cultural, and mechanical methods. To ensure that the herbicides you use are as effective, safe, and economical as possible, always:

- Select the appropriate herbicide for your weed problem and crop. Stage of crop and weed growth, soil moisture, and temperature can affect herbicide selection. For suggestions, refer to the Penn State *Field Crop Weed Control Guide* or consult with your county extension agent.
- Read the product label and follow directions. The label provides important information on use, application, safety, and storage.
- Apply herbicides at the proper time.
- Apply the recommended rate to avoid injury, residues, or poor control.
- Mix only the amount of herbicide needed, to avoid disposal problems.
- Calibrate application equipment several times during the season to ensure that the correct amount of herbicide is applied.
- Wear proper protective clothing.
- Learn to predict weed problems. Scout fields regularly and record the types and locations of weeds present. Use records to plan integrated control programs.

Spot-treat isolated patches of johnsongrass or shattercane with glyphosate (Roundup Ultra 4S or other products containing glyphosate) when the weeds are 12 to 18 inches tall and actively growing. Add 1.25 ounces Roundup Ultra per gallon of water (1 percent volume per volume (v/v) solution).

Control In Corn

Johnsongrass and shattercane are generally harder and more costly to control in corn than in soybean. Traditional programs have centered around the use of EPTC (Eradicane and Eradicane Extra). With the introduction of effective foliar-applied corn herbicides and herbicide-resistant corn hybrids, additional programs can be developed to manage these troublesome weeds in corn.

SOIL-APPLIED TREATMENTS

—***Eradicane 6.7E*** or ***Eradicane Extra 6E*** (EPTC). For suppression of johnsongrass rhizomes and control of shattercane and johnsongrass seedlings, thoroughly disk and delay corn planting until grassy weed growth begins in mid- to late May. Apply 7.33 pints Eradicane or 8 pints Eradicane Extra per acre and incorporate in two passes in opposite directions with a disk set at 4 to 6 inches deep. Immediate and thorough incorporation is necessary for effective herbicide activity. Eradicane Extra contains an extender and should be used in fields with a history of EPTC use.

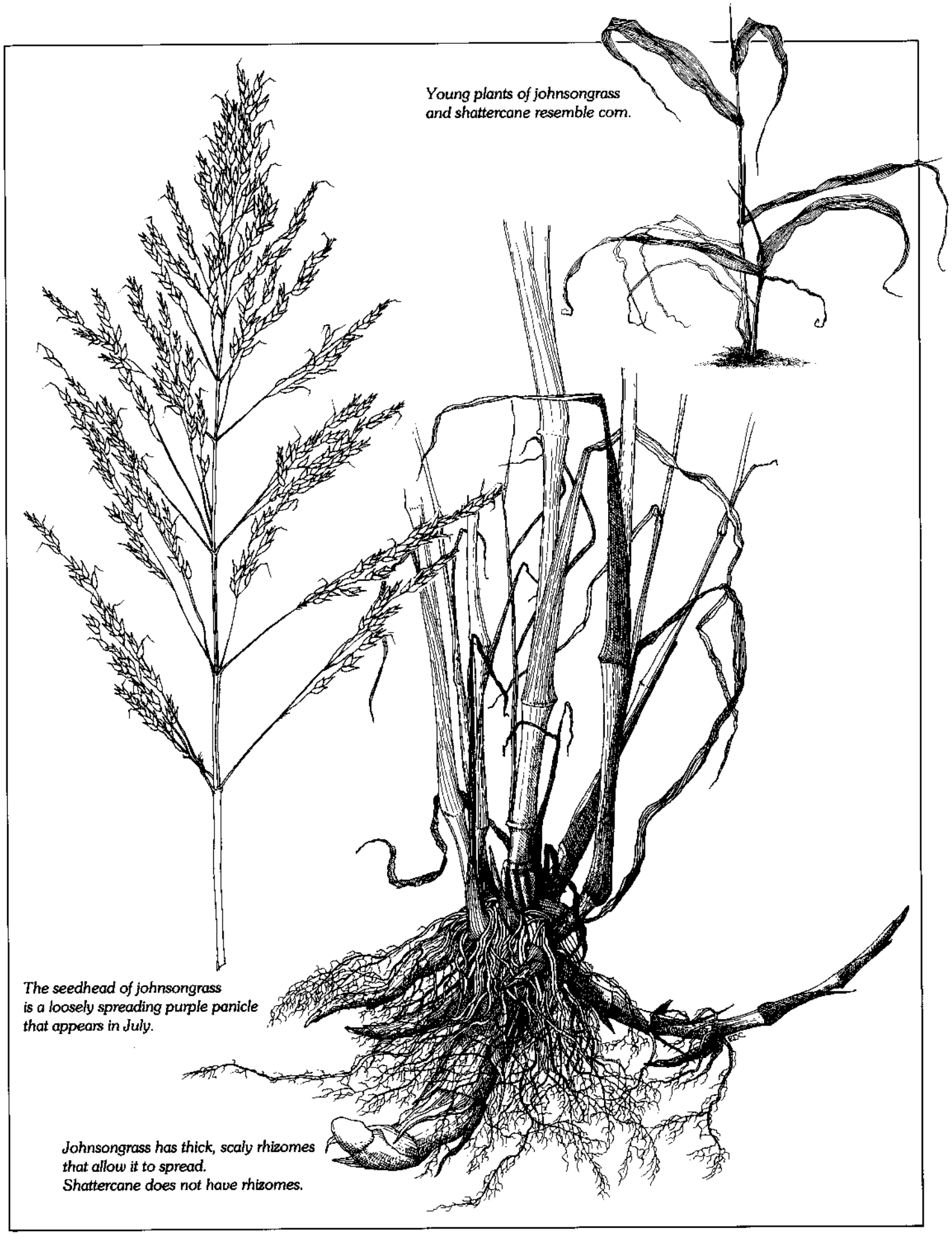
FOLIAR-APPLIED TREATMENTS

Most foliar-applied herbicides do not provide soil residual control of johnsongrass or shattercane. Especially with johnsongrass, two applications may be necessary for complete control.

—***Accent 75DF*** (nicosulfuron) provides 85 to 95 percent control. Foliar-apply 0.66 ounces 75DF per acre when shattercane is 4 to 12 inches tall or rhizome johnsongrass is 8 to 18 inches tall. Accent may be broadcast until corn is 20 inches tall or postdirected until it is 36 inches tall. Avoid direct contact with the corn whorl. Include a nonionic surfactant in the spray mixture at 1 quart per 100 gallons (0.25 percent v/v) or crop oil concentrate at 4 quarts per 100 gallons (1 percent v/v) with or without 1 gallon per acre nitrogen fertilizer solution (UAN). Do not use on corn that has been treated with the insecticide Counter, and do not tank-mix with Basagran, Laddok, or 2,4-D. May be tank-mixed with Buctril, Buctril plus atrazine, Banvel/Clarity, or Marksman, but include only a nonionic surfactant.

—***Basis Gold 89.5DF*** (nicosulfuron plus rimsulfuron plus atrazine) provides 70 to 90 percent control. Apply 14 ounces of Basis Gold before corn is 12 inches tall (or the 6-collar stage) and when shattercane or seedling johnsongrass is less than 8 inches tall. Include crop oil concentrate at 1 gallon per 100 gallons and UAN at 2 quarts per acre in the spray mixture. Be cautious of restrictions associated with the use of certain organophosphate insecticides such as Counter, Lorsban, Dyfonate, and Thimet. May be tank-mixed with other herbicides.

—***Beacon 75DF*** (primisulfuron) provides 80 to 95 percent control. When corn is 4 to 20 inches tall, foliar-apply 0.76 ounces 75DF per acre to shattercane that is 4 to 12 inches tall or rhizome johnsongrass that is 8 to 16 inches tall. Include a nonionic surfactant in the spray mixture at 1 quart per 100 gallons (0.25 percent v/v) or crop oil concentrate at 4 quarts per 100 gallons (1 percent v/v) with or without 1 gallon per acre UAN. A second application or split application may be made before tassel emergence. With split applications, apply 0.38 to 0.57 ounce 75DF per acre early, followed by a second application before tassel emergence (total 0.76 ounce 75DF). Apply with drop nozzles if weed coverage is a concern, and avoid contact with the corn whorl. Do not apply to corn that has been treated with the insecticide Counter. Also, do not apply foliar organophosphate insecticides within 10 days before or after Beacon.



Young plants of johnsongrass and shattercane resemble corn.

The seedhead of johnsongrass is a loosely spreading purple panicle that appears in July.

Johnsongrass has thick, scaly rhizomes that allow it to spread. Shattercane does not have rhizomes.

May be tank-mixed with Banvel/Clarity, Buctril, Marksman, or 2,4-D, but include only a nonionic surfactant.

—***Exceed 57WG*** (prosulfuron plus primisulfuron) provides 70 to 80 percent control. Apply 1 ounce per acre to 4- to 12-inch-tall shattercane or seedling johnsongrass. Include a nonionic surfactant in the spray mixture at 1 quart per 100 gallons (0.25 percent v/v) or crop oil concentrate at 1 to 2 pints per acre with or without 1 gallon per acre UAN. Be cautious of restrictions associated with the use of certain organophosphate insecticides such as Counter, Lorsban, Dyfonate, and Thimet. May be tank-mixed with Banvel/Clarity, Buctril, Marksman, or 2,4-D, but include only a nonionic surfactant.

—***Liberty 1.67L*** (glufosinate) provides 60 to 80 percent control. *For use only on Liberty Link or glufosinate-resistant corn hybrids.* Apply 20 to 28 fluid ounces when shattercane or seedling johnsongrass is 4 to 8 inches tall. Include 3 pounds per acre of ammonium sulfate in the spray tank. A sequential application of Liberty likely will be necessary for suppression of rhizome johnsongrass. Liberty will control only weeds that have emerged. Liberty may be tank-mixed with other appropriate postemergence herbicides to broaden the spectrum of control.

—***Poast 1.5EC*** (sethoxydim) provides 80 to 85 percent control. *For use only on Poast Protected/SR corn hybrids.* Apply 1 pint per acre to shattercane before it is 18 inches tall and to seedling johnsongrass before it is 8 inches tall. Add 2 pints per acre crop oil concentrate and 2 quarts per acre UAN to the spray mixture. If tank-mixing with broadleaf herbicides, add UAN only to the spray mixture.

—***Pursuit 2AS/70DG*** (imazethapyr) or ***Lightning 70DG*** (imazethapyr plus imazapyr) provides 70 to 90 percent control. *For use only with IMI-corn varieties.* Check with your seed supplier for available varieties; Pursuit may be foliar-applied at 4 fluid ounces 2AS or 1.44 ounces 70DG per acre up to the 8-leaf stage of corn. Apply Lightning at 1.28 ounces per acre to 1- to 8-inch-tall shattercane or johnsongrass and before corn is 12 inches tall. See the "Control in Soybean" section for additional information about Pursuit, and be aware of the potential for resistant weed development from repeated applications of sulfonylurea or imidazolinone herbicides (e.g., Accent, Beacon, Canopy, Classic, Pursuit, Scepter, Python).

—***Roundup Ultra 4S*** (glyphosate) provides 90 to 95 percent control. *This treatment can be applied over-the-top to Roundup Ready corn hybrids only.* Apply 0.5 to 1 quart per acre 3 to 5 weeks after planting and before shattercane and johnsongrass exceed 18 inches in height. A sequential Roundup application (0.5 to 1 quart per acre; do not apply more than 2 quarts per acre total) may be necessary for improved rhizome johnsongrass control. May be tank-mixed with other herbicides. Consult product label for additional restrictions.

Control In Soybean

Johnsongrass and shattercane can be easier to control in soybean than in other crops since several post-grass herbicides and herbicide-resistant soybean varieties are available. In addition, several soil-applied herbicides can suppress or control johnsongrass and shattercane seedlings.

SOIL-APPLIED TREATMENTS

These treatments will not effectively control johnsongrass rhizomes.

—***Command 3ME*** (clomazone) provides 80 to 95 percent control of johnsongrass and shattercane seedlings. It is not effective on johnsongrass rhizomes. Apply Command preemergence at 1.33 to 2.67 pints per acre. Refer to a Command label for specific application information and restrictions.

—***Canopy 75DF*** (chlorimuron plus metribuzin) or ***Canopy XL 56DF*** (sulfentrazone plus chlorimuron) are primarily broadleaf herbicides that will suppress johnsongrass and shattercane seedlings. Neither herbicide is effective on johnsongrass rhizomes. Canopy is soil-applied at 4 to 8 ounces and Canopy XL at 5.1 to 7.9 ounces per acre. Do not use on soil with a pH greater than 6.8 or rotation crop injury may result. See a current label for additional restrictions.

—***Pursuit 2AS/70DG*** (imazethapyr), ***Scepter 1.5AS/70DG*** (imazaquin), or ***Steel 2.59E*** (imazethapyr plus imazaquin plus pendimethalin). Pursuit and Steel provide 75 to 85 percent control of johnsongrass and shattercane seedlings; Scepter suppresses both. These herbicides are not effective on johnsongrass rhizomes. Apply Pursuit at 4 fluid ounces 2AS or 1.44 ounces 70DG per acre; Scepter at 0.66 pints 1.5 AS or 2.8 ounces 70DG per acre; and Steel at 3 pints per acre preplant or preemergence. Preplant-incorporated applications of Pursuit, Scepter, or Steel are more effective on johnsongrass and shattercane seedlings than are surface applications. See current Pursuit, Scepter, or Steel labels for additional guidelines and restrictions.

—***Prowl 4EC*** (pendimethalin) or ***Treflan 4EC*** (trifluralin). Incorporated applications of Prowl or Treflan will suppress johnsongrass and shattercane seedlings. They are not effective on johnsongrass rhizomes. Apply Prowl at 1 to 3 pints and Treflan at 1 to 2 pints per acre.

FOLIAR-APPLIED TREATMENTS

Several postemergence applications can effectively control shattercane and johnsongrass. Application timing is critical for success.

—***Assure II 0.8E*** (quizalofop) provides 85 to 95 percent control. Apply 5 fluid ounces postemergence to shattercane and johnsongrass seedlings and 10 fluid ounces to rhizome johnsongrass. Apply when johnsongrass seedlings are 2 to 8 inches tall, shattercane is 6 to 12 inches tall, and rhizome johnsongrass is 10 to 24 inches tall. Always include a nonionic surfactant in

the spray solution at 1 quart per 100 gallons (0.25 percent v/v) or crop oil concentrate at 4 quarts per 100 gallons (1 percent v/v). A second application may be needed for complete control. Before tank-mixing with broadleaf herbicides, read an herbicide label for guidelines to avoid reduced grass control.

—***Fusilade DX 2E*** (fluazifop) provides 85 to 95 percent control. Apply 6 fluid ounces per acre when johnsongrass seedlings are 2 to 8 inches tall, 6 fluid ounces when shattercane is 6 to 12 inches tall, and 12 fluid ounces when rhizome johnsongrass is 8 to 18 inches tall. Always add crop oil concentrate to the spray solution at 4 quarts per 100 gallons (1 percent v/v) or a nonionic surfactant at 1 to 2 quarts per 100 gallons (0.25 to 0.5 percent v/v). With johnsongrass, a higher rate of Fusilade may be required in sodded situations, and a second application may be needed for complete control. Before tank-mixing with broadleaf herbicides, read the herbicide label to avoid reduced grass control.

—***Fusion 2.56E*** (fenoxaprop plus fluazifop) provides 80 to 85 percent control. Apply 6 fluid ounces per acre to seedling johnsongrass or shattercane. Apply when shattercane is 6 to 12 inches tall or seedling johnsongrass is 2 to 8 inches tall. Apply 10 to 12 fluid ounces when rhizome johnsongrass is 8 to 18 inches tall. Always add to the spray solution crop oil concentrate at 2 to 4 quarts per 100 gallons (0.5 to 1 percent v/v) or a nonionic surfactant at 1 to 2 quarts per 100 gallons (0.25 to 0.5 percent v/v). With johnsongrass, a higher rate of Fusion may be required in sodded situations, and a second application may be needed for complete control. Before tank-mixing with broadleaf herbicides, read the herbicide label to avoid reduced grass control.

—***Liberty 1.67L*** (glufosinate) provides 60 to 80 percent control. *For use only on Liberty Link soybean varieties.* Apply 20 to 28 fluid ounces when shattercane or seedling johnsongrass is 4 to 8 inches tall. Include 3 pounds per acre of ammonium sulfate in the spray tank. A sequential application of Liberty likely will be necessary for suppression of rhizome johnsongrass. Liberty will control only weeds that have emerged. Liberty may be tank-mixed with other appropriate postemergence herbicides to broaden the spectrum of control.

—***Poast 1.5EC*** or ***Poast Plus 1EC*** (sethoxydim) provides 75 to 85 percent control. Apply 1 pint Poast or 24 fluid ounces Poast Plus per acre postemergence when shattercane is 6 to 18 inches tall. Apply 1 to 1.5 pints Poast or 24 to 36 fluid ounces Poast Plus when johnsongrass seedlings are 8 inches tall or rhizome johnsongrass is 15 to 20 inches tall (may be applied to 25-inch johnsongrass in conventional tillage). Add to the spray solution 2 pints crop oil concentrate or Dash plus 1 gallon UAN or 2.5 pounds dry ammonium sulfate per acre. A second application may be needed for improved control. Before tank-mixing with broadleaf herbicides, read the herbicide label for guidelines to avoid reduced grass control.

—***Roundup Ultra 4S*** (glyphosate) provides 90 to 95 percent control. *This treatment can be applied over-the-top to Roundup Ready soybean varieties only.* Apply 32 fluid ounces per acre 3 to 5 weeks after planting. In general, shattercane and johnsongrass should be less than 18 inches tall at application time. A sequential Roundup application (16 to 32 ounces per acre; do not apply more than 3 quarts per acre total) may be necessary for improved rhizome johnsongrass control. Consult product label for additional restrictions.

—***Select 2E*** (clethodim) provides 85 to 95 percent control. Apply 4 to 6 fluid ounces per acre with 4 quarts per 100 gallons (1 percent v/v) crop oil concentrate postemergence when shattercane or johnsongrass seedlings are 4 to 10 inches tall. Apply 8 fluid ounces when rhizome johnsongrass is 12 to 24 inches tall. Use the lower rate of Select under favorable soil moisture and high humidity conditions. A second application may be needed for complete johnsongrass control. Before tank-mixing with broadleaf herbicides, read the herbicide label to avoid reduced grass control.

—***Pursuit 2AS/70DG*** (imazethapyr) provides 70 to 95 percent control. Postemergence application of Pursuit will control shattercane and johnsongrass seedlings and provide some suppression of johnsongrass rhizomes. Apply 4 fluid ounces 2AS or 1.44 ounces 70DG per acre postemergence when shattercane or johnsongrass is 1 to 8 inches tall. Add to the solution a nonionic surfactant at 1 quart per 100 gallons (0.25 percent v/v) or crop oil concentrate at 1.5 pints per acre plus 1 to 2 quarts UAN or 2.5 pounds ammonium sulfate per acre. Refer to a current Pursuit label for additional information and restrictions.

Control In Alfalfa and Small Grains

Planting alfalfa or small grains in rotation provides an opportunity to control johnsongrass or shattercane with glyphosate (Roundup Ultra 4S). Apply glyphosate at 1 to 2 quarts per acre before planting alfalfa, winter wheat, or winter barley, or after harvesting spring oats. Apply when johnsongrass is 12 to 18 inches tall and actively growing. Tilling 5 to 7 days after application will improve the level of control.

Shattercane and johnsongrass tend to be less problematic in forages because of frequent cutting, but competition in new spring seedlings could reduce the forage stand. Poast, Poast Plus, and Select are the only foliar-applied grass herbicides labeled for use in alfalfa.

—***Poast Plus 1EC*** or ***Poast 1.5EC*** (sethoxydim) provides 75 to 85 percent control. Apply Poast Plus to alfalfa at 24 to 36 fluid ounces or Poast at 1 to 2.5 pints per acre when johnsongrass seedlings are 3 to 8 inches tall, shattercane is 6 to 18 inches tall, or rhizome johnsongrass is 12 inches tall. Add to the spray solution 2 pints crop oil concentrate or Dash plus 0.5 to 1 gallon UAN or 2.5 pounds dry ammonium sulfate per acre. A second application may be needed for improved control. Refer to appropriate label for grazing and haying restrictions.

—***Select 2E*** (clethodim) provides 85 to 95 percent control. Apply 6 to 8 fluid ounces per acre with 4 quarts per 100 gallons (1 percent v/v) crop oil concentrate postemergence when shattercane or johnsongrass seedlings are 4 to 10 inches tall. Apply 8 fluid ounces when rhizome johnsongrass is 12 to 24 inches tall. Use the lower rate of Select under favorable soil moisture and high humidity conditions. A second application may be needed for complete johnsongrass control. May be tank-mixed with 2,4-DB for broadleaf weed control. Refer to the herbicide label for additional restrictions.

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