2018
Weed Management Suggestions *for* Mississippi Row Crops

MISSISSIPPI STATE UNIVERSITY™
EXTENSION

Contents

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Introduction

This guide contains the 2018 management suggestions for weed control in corn, cotton, grain sorghum, peanuts, rice, small grain crops, and soybeans grown in Mississippi. Additionally, it includes management options for the control of herbicide-resistant weeds common in Mississippi. These management suggestions are based on results of research and demonstrations conducted by the Mississippi Agriculture and Forestry Experiment Station and the Mississippi State University Extension Service. Decisions regarding management suggestions are made by the contributing authors listed above and are based on at least 2 years of replicated data at different research sites in Mississippi.

This publication contains weed management suggestions that are subject to change; therefore, these management suggestions are offered only as a guide. It is always the applicator's responsibility, by law, to read and follow all current label directions for the specific herbicide being used. The label always takes precedence over management suggestions found in this publication.

The information given here is for educational purposes only. References to commercial products, trade names, or suppliers are made with the understanding that no endorsement is implied and that no discrimination against other products or suppliers is intended. Additionally, references to commercial products do not guarantee or warrant the standards of those products.

Herbicide-Resistant Weed Management

Herbicide-Resistant Weeds

Repeated applications of the same herbicide or a different herbicide with similar mode of action on the same field growing season after growing season has contributed to the widespread occurrence of resistance to herbicides in several weed species around the world, in the U.S., and in Mississippi (see list below). Weed management programs must not depend solely on herbicides to be economically sustainable in the long term. In general, a combination of the following strategies is recommended:

1. Use residual herbicides.
2. Practice crop rotation.
3. Rotate herbicides with different modes of action.
4. Tank-mix herbicides with different modes of action at full recommended rates.
5. Avoid sequential applications of the same herbicide continually.
6. Utilize tillage, cultivation, and other cultural practices wherever and whenever feasible.
7. Clean equipment thoroughly before and after each use.
8. Control weeds postharvest to reduce soil seedbank.

Herbicide-Resistant Weeds in Mississippi

Species	WSSA group	Herbicide active ingredient
Annual bluegrass	5	simazine
Barnyardgrass/junglerice	1	cyhalofop, fenoxaprop,
	2	bispyribac, imazamox, imazethapyr, penoxsulam
	4	quinclorac
	7	propanil
Common cocklebur	2	imazaquin, imazethapyr
	17	MSMA, DSMA,
Common ragweed	9	glyphosate
Goosegrass	3	pendimethalin, trifluralin
	9	glyphosate
	17	DSMA, MSMA
Horseweed (mare's-tail)	9	glyphosate
	22	paraquat
Italian ryegrass	1	diclofop
	2	imazapic, imazapyr, mesosulfuron, metsulfuron, pyroxsulam, sulfometuron
	9	glyphosate
Johnsongrass	1	fenoxaprop, fluazifop, quizalofop
	3	pendimethalin, trifluralin
	9	glyphosate
Palmer amaranth	2	pyrithiobac
	9	glyphosate
Pigweed species	2	sulfometuron
Rice flatsedge	2	Halosulfuron, imazethapyr
Spiny amaranth	9	glyphosate
Tall waterhemp	9	glyphosate

Herbicide-Resistant Weed Management

Management Options for Herbicide-Resistant Weeds

These are suggested options for managing herbicide-resistant weeds in the major agronomic crops of Mississippi. These are not the only options, but they have proven effective at managing herbicide-resistant weeds in Mississippi. See overall herbicide resistance summary in this section for details on existing herbicide-resistant weeds in Mississippi.
NOTE: Consult individual crop sections in this publication or product labels for specific information on application rates, timings of application, preplant intervals, and crop rotation restrictions.

Crop	Herbicide(s)	Rate	Timing of application	Special instructions
Barnyardgrass (ALS-resistant)				
Rice	propanil	3–6 lb ai/A, depending on barnyardgrass size	Postemergence to barnyardgrass with less than four leaves	Add crop oil concentrate at 1% v/v if using an SC propanil formulation. Sequential applications may be needed for complete control. Add clomazone, pendimethalin, or quinclorac for residual control after application.
Rice	quinclorac	0.25–0.5 lb ai/A, depending on barnyardgrass size	Preemergence or postemergence until 40 days before harvest	Add crop oil concentrate at 1 quart per acre for postemergence applications. Apply with clomazone or pendimethalin for additional residual control. Apply with propanil, Ricestar HT, or Clincher SF for additional postemergence control. May be applied postflood, but this would be an emergency salvage treatment.
Rice	RiceBeaux	4 qt/A	Postemergence to barnyardgrass with one to three leaves	Soil should be moist at time of application and not allowed to crack after application. RiceBeaux works best as a component of a barnyardgrass program including preemergence and postemergence applications of other herbicides.
Barnyardgrass (ALS-, propanil-, and quinclorac-resistant)				
Rice	Clincher SF	15 oz/A	Postemergence from one-leaf rice to early tillering stage to barnyardgrass with fewer than four leaves	Soil moisture is critical for good activity. Weed foliage must not be covered with water at application. Add clomazone or pendimethalin for residual control. Add crop oil concentrate or methylated seed oil (MSO) at 1 quart per acre. May be applied postflood, but this would be an emergency salvage treatment.
Rice	clomazone	0.8–1.6 pt/A, depending on soil texture	Preemergence after planting but before rice emergence; postemergence to rice with one to two leaves	Use the higher rate on heavier-textured soils. Clomazone provides no postemergence control. Apply with glyphosate if barnyardgrass is emerged at preemergence application. Apply with Clincher SF or Ricestar HT if barnyardgrass is emerged at postemergence application.
Rice	pendimethalin	Formulation and soil texture dependent	Delayed preemergence after rice seed have imbibed water for germination	Use higher rate on heavier-textured soils. Provides no postemergence control. Include Clincher SF or Ricestar HT to control emerged barnyardgrass.
Rice	Ricestar HT	24 oz/A	Postemergence from two-leaf rice to early tillering stage and to barnyardgrass with fewer than four leaves	Soil moisture is critical for good activity. Flush the field before application if soil is dry. Weed foliage must not be covered with water at time of application. Add clomazone or pendimethalin for residual control after application.
Barnyardgrass (propanil- and quinclorac-resistant)				
Rice	Beyond	5–6 oz/A	Postemergence from four-leaf rice until 14 days after panicle initiation on varieties; from four- leaf rice to panicle initiation on hybrids	Use on Clearfield rice varieties and hybrids only. Add crop oil concentrate at 1 quart per acre. Beyond may be substituted for the second application of Newpath, but two applications are required before flooding. This treatment may be applied postflood, but this would be an emergency salvage treatment.

Herbicide-Resistant Weed Management

Rice	Clearpath	0.5 lb/A	Preplant incorporated, preemergence, or postemergence until one-leaf rice	Use on Clearfield rice varieties and hybrids only. Add crop oil concentrate at 1 quart per acre. Clearpath must be followed by an application of Newpath or Beyond before flooding.
Rice	Grasp	2–2.8 oz/A, depending on application timing	Postemergence until 60 days before harvest	Add crop oil concentrate or methylated seed oil (MSO) at 1 quart per acre. Add clomazone or pendimethalin for residual control after application. This treatment may be applied postflood, but this would be an emergency salvage treatment.
Rice	Newpath	4–6 oz/A	Preplant incorporated, preemergence, or postemergence until flooding	Use on Clearfield rice varieties and hybrids only. Add crop oil concentrate at 1 quart per acre. Applications made preplant incorporated, preemergence, or to one- to two-leaf rice should be followed by a second application of Newpath or Beyond before flooding.
Rice	Regiment	0.4–0.67 oz/A, depending on barnyardgrass size	Postemergence from three-leaf rice to 0.5-inch internode elongation	See the Regiment label for a list of adjuvants approved by Valent. Add clomazone or pendimethalin for residual control after application. This treatment may be applied postflood, but this would be an emergency salvage treatment.
Goosegrass (glyphosate-resistant)				
Cotton, soybean	clethodim	0.07–0.125 lb ai/A	Postemergence to goosegrass with 2–6 inches of lateral growth	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Cotton, soybean	Fusilade DX	8 oz/A	Postemergence to goosegrass less than 5 inches with fewer than six leaves	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Cotton, soybean	quizalofop	0.048–0.055 lb ai/A	Postemergence to goosegrass with 2–6 inches of lateral growth	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Cotton, soybean	sethoxydim	0.188 lb ai/A	Postemergence to goosegrass less than 6 inches	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Horseweed (glyphosate- and paraquat-resistant)				
Corn, cotton, rice, soybean	2,4-D	Formulation dependent	Postemergence during fall to spring burndown	Apply alone or with residual herbicide listed in this section. 2,4-D provides no residual control. It is often applied with glyphosate or glyphosate plus residual herbicide in a spring burndown program.
Corn	2,4-D	Formulation dependent	Postemergence to corn only less than 8 inches	Postemergence applications of 2,4-D may cause injury such as lodging, bending, and brittle stalks.
Corn	atrazine	1.5–2.5 lb ai/A	Preplant, preemergence, or post-emergence from 14 days before planting until corn reaches 12 inches	Atrazine may be applied with glyphosate, paraquat, or glufosinate to improve grass and broadleaf weed control before corn emergence. Add crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Soybean	Canopy	4–6 oz/A	Preemergence during fall to spring burndown up to planting	Apply before horseweed emerges. Add 2,4-D or dicamba to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.

Herbicide-Resistant Weed Management

Soybean	Canopy EX	2 oz/A	Preemergence during fall to spring burndown up to 7 days before planting	Apply before horseweed emerges. Add 2,4-D or dicamba to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.
Corn, cotton, soybean	dicamba	Formulation dependent	Postemergence during fall to spring burndown	Apply alone or with residual product listed in this section. Dicamba provides no residual horseweed control. It is often applied with glyphosate or glyphosate plus residual herbicide in a spring burndown program.
Corn	dicamba	Formulation dependent	Postemergence to corn only less than 36 inches	Do not add crop oil concentrate to dicamba applied after corn emergence to avoid injury.
Cotton	diuron	0.5–1.6 lb ai/A, depending on soil texture	Preemergence during fall to spring burndown	Apply before horseweed emerges. Add 2,4-D, dicamba, or glufosinate to control emerged horseweed. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v when tank-mixing with 2,4-D or dicamba. A postemergence application will likely be required for spring-emerged horseweed.
Soybean	Envive	3 oz/A	Preemergence during fall to spring burndown up to planting	Apply before horseweed emerges. Add 2,4-D or dicamba to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.
Cotton	Envoke	0.15 oz/A	Preemergence during fall to spring burndown but 3 months before planting	Apply before horseweed emerges. Add 2,4-D, dicamba, or glufosinate to control emerged horseweed. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v when tank-mixing with 2,4-D or dicamba.
Corn, soybean	Fierce	3–3.75 oz/A	Preemergence during fall to spring burndown	Apply before horseweed emerges. If horseweed has emerged, add 2,4-D or dicamba. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v when tank-mixing with 2,4-D or dicamba.
Soybean	FirstRate	0.75 oz/A	Preemergence during fall to spring burndown but before soybean emergence	Apply before horseweed emerges. Add 2,4-D, dicamba, or glufosinate to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.
Soybean	FirstRate	0.3–0.6 oz/A	Preemergence or postemergence up to 50% flowering soybean	FirstRate may be applied postemergence to soybean and horseweed at 0.3 ounce per acre. A second application of 0.3 ounce may be applied 10 to 14 days later to control regrowth and provide longer residual activity. A single application of 0.6 ounce per acre may be applied under high weed pressure.
Soybean	FirstRate + glyphosate	0.3–0.6 oz/A + formulation dependent	Preemergence or postemergence up to 50% flowering soybean	If applied with glyphosate formulation preloaded with an adjuvant, no additional adjuvant is required. However, improved control has been observed when an additional adjuvant is used in the preloaded glyphosate formulation.
Corn, cotton, rice, soybean	flumioxazin	0.064 lb ai/A	Preemergence during fall to spring burndown	Apply before horseweed emerges. If horseweed has emerged, add 2,4-D or dicamba. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v when tank-mixing with 2,4-D or dicamba.
Corn, cotton, rice, soybean	glufosinate	0.4-0.66 lb ai/A	Postemergence during fall to spring burndown but before crop emergence	Glufosinate is often applied at planting as a salvage treatment. Control is dependent on size and age of horseweed, spray coverage, and air temperature. Daytime temperatures should be at least 70°F at application and for 3 to 4 days after application.

Herbicide-Resistant Weed Management

Corn, cotton, soybean	glufosinate	0.4-0.79 lb ai/A, depending on crop	Postemergence; see individual crop sections for specific application timings	Use only on LibertyLink crops. Sequential applications should be made 10 to 14 days apart.
Rice	Grasp	2.3 oz/A	Postemergence to horseweed less than 6 inches	Add crop oil concentrate or methylated seed oil (MSO) at 1 quart per acre. Grasp will not completely control horseweed until after flooding.
Corn	Halex GT + atrazine	3.6–4 pt/A + 1.5 lb ai/A	Postemergence until corn reaches 12 inches	Add nonionic surfactant at 0.25% v/v.
Corn	Lexar EZ	2.25–3 qt/A, depending on soil texture	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Add glyphosate, paraquat, or glufosinate to improve grass and broadleaf weed control before corn emergence. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Rice	propanil + quinclorac	4 lb ai/A + 0.375 lb ai/A	Postemergence to horseweed less than 6 inches	Add crop oil concentrate at 1% v/v if using an SC propanil formulation. Propanil plus quinclorac will not completely control horseweed until after flooding.
Soybean	Python	1–1.33 oz/A	Preemergence up to 30 days before planting but before soybean emergence	Apply before horseweed emerges. Add 2,4-D, dicamba, or glufosinate to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.
Corn, cotton, rice, soybean	Sharpen	1–3 oz/A, depending on crop and soil texture	Preemergence or postemergence during fall to spring burndown	Horseweed should be less than 4 to 6 inches in height or diameter, depending on rate. Add glyphosate, paraquat, or glufosinate to improve grass and broadleaf weed control. Add methylated seed oil (MSO) at 1% v/v and ammonium sulfate at 1% to 2% v/v.
Soybean	Synchrony XP	1.125 oz/A	Preemergence to early postemergence	This treatment is for use on STS soybean varieties only when applying 1.125 ounces per acre postemergence. Control with Synchrony XP may be incomplete or inconsistent.
Soybean	Synchrony XP + glyphosate	1.125 oz/A + formulation dependent	Preemergence to early postemergence	This treatment is for use on STS soybean varieties only when applying 1.125 ounces per acre postemergence. Improved control has been observed when additional adjuvant is used with preloaded glyphosate formulation.
Soybean	Valor XLT	3 oz/A	Preemergence during fall to spring burndown but before soybean emergence	Apply before horseweed emerges. Add 2,4-D or dicamba to control emerged horseweed. If applied with 2,4-D or dicamba, add 1% crop oil or 0.25% nonionic surfactant.
Italian ryegrass (glyphosate- and ALS-resistant)				
Corn, soybean	Boundary	2 pt/A	Preemergence from mid-October to mid-November	Apply with paraquat at 0.75 pound of active ingredient per acre if Italian ryegrass is emerged at application. Paraquat should be applied in at least 15 gallons of water by ground and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v.
Corn, cotton, soybean, rice	clethodim	0.094–0.125 lb ai/A	Postemergence from late January to early February to Italian ryegrass less than 6 inches	Multiple applications of clethodim are not recommended. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant. Sequential application of paraquat will be required if no fall residual was applied.

Herbicide-Resistant Weed Management

Rice	clomazone	0.75 lb ai/A	Preemergence from mid-October to mid-November	Apply with paraquat at 0.75 pound of active ingredient per acre if Italian ryegrass is emerged at application. Paraquat should be applied in at least 15 gallons of water by ground and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v.
Corn, cotton, soybean	metolachlor or *S*-metolachlor	1.27–1.58 lb ai/A, depending on soil texture	Preemergence from mid-October to mid- November	Use the higher rate on heavier-textured soils. Apply with paraquat at 0.75 pound of active ingredient per acre if Italian ryegrass is emerged at application. Paraquat should be applied in at least 15 gallons of water by ground and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v.
Corn, cotton, soybean, rice	paraquat	0.75–1 lb ai/A	Postemergence from mid-February to early-March to Italian ryegrass less than 12–14 inches	Paraquat should be applied in at least 15 gallons of water and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v. Avoid air induction nozzles. Apply with PSII herbicide to improve postemergence control. Paraquat should be applied 2 to 4 weeks after clethodim if no fall residual was applied.
Cotton, soybean	trifluralin	0.75–1 lb ai/A	Preemergence from mid-October to mid-November	Use the higher rate on heavier-textured soils. Incorporate 1 to 2 inches deep immediately after application for best results. A 30% loss can occur if incorporation is delayed 24 hours.
Corn, cotton, soybean	Zidua	2–4 oz/A, depending on soil texture	Preemergence from mid-October to mid- November	Use the higher rate on heavier-textured soils. Apply with paraquat at 0.75 pound of active ingredient per acre if Italian ryegrass is emerged at application. Paraquat should be applied in at least 15 gallons of water by ground and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v.
Wheat	Axial XL	16.4 oz/A	Postemergence to wheat from two-leaf to preboot and to Italian ryegrass from one-leaf to two-tiller	Only one application is allowed per growing season. Do not mix with other postemergence herbicides, such as Harmony Extra or 2,4-D.
Wheat	Axiom	5–10 oz/A	Early postemergence from wheat germination up to two-leaf stage but before weed emergence	This product contains metribuzin. Some wheat varieties are sensitive to metribuzin.
Wheat	metribuzin	0.094–0.125 lb ai/A	Postemergence after wheat has reached two-leaf stage until jointing	Some wheat varieties are sensitive to metribuzin. Metribuzin rate depends on wheat growth stage. Multiple applications are allowed per season, but a minimum of 21 days between applications is required.
Palmer amaranth (glyphosate- and ALS-resistant)				
Corn	2,4-D	Formulation dependent	Postemergence to corn less than 8 inches	Postemergence applications of 2,4-D may cause some injury, such as lodging, bending, and brittleness. Stalks remain brittle for 5 to 7 days after application, during which time they are susceptible to breaking.
Corn	Anthem ATZ	1.75–3 pt/A	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Add glyphosate, paraquat, or glufosinate to improve grass and broadleaf weed control before corn emergence. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Corn	Armezon or Impact + atrazine	0.75 oz/A + 0.5–1 lb ai/A	Postemergence until corn reaches 12 inches and to Palmer amaranth less than 4 inches	Add ammonium sulfate and 1% methylated seed oil. Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids.

Herbicide-Resistant Weed Management

Corn	atrazine + acetochlor	Formulation dependent	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Control is dependent on activation of herbicide and level of weed infestation. Use the higher rate on heavier-textured soils. Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids.
Corn	atrazine + metolachlor or *S*-metolachlor	Formulation dependent	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Control is dependent on activation of herbicide and level of weed infestation. Use the higher rate on heavier-textured soils. Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids.
Soybean	Authority Elite	19–32 oz/A, depending on soil texture + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Warrant should be applied when weather is warm; lower temperatures may reduce activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Authority MTZ + Group 15 herbicide	8–18 oz/A + appropriate rate for Group 15 herbicide	Preemergence up to 7 days before planting	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Injury may occur if rain falls soon after crop emergence. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Boundary	1.2–2.5 pt/A, depending on soil texture	Preemergence up to 7 days before planting	Injury may occur if rain falls soon after crop emergence, especially on sand or silt-loam soils. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Canopy + Group 15 herbicide	4–6 oz/A + appropriate rate for Group 15 herbicide	Preemergence up to 7 days before planting	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Injury may occur if rain falls soon after crop emergence. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Corn	Capreno + atrazine	3 oz/A + 0.5–1 lb ai/A	Postemergence until corn reaches 12 inches and to Palmer amaranth less than 4 inches	Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids. Add crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Corn	Corvus + atrazine	5.6 oz/A + 0.5–1 lb ai/A	Preplant, preemergence, or early postemergence from 14 days before planting until V2 corn stage	Add glyphosate, paraquat, or glufosinate to improve grass and broadleaf weed control before corn emergence. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Corn	dicamba	Formulation dependent	Postemergence to corn less than 36 inches and to Palmer amaranth less than 4 inches	Do not add crop oil concentrate to dicamba applied after crop emergence as crop injury may result. Dicamba may be applied with glyphosate to improve grass and broadleaf weed control.
Cotton	diuron	0.8 lb ai/A	Post-directed when cotton is at least 12 inches tall and after last cultivation	Apply with glyphosate and MSMA (1 pound of active ingredient per acre) to improve control of emerged Palmer amaranth and other weeds. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate and/or MSMA formulations not preloaded with an adjuvant.
Soybean	Envive + Group 15 herbicide	3 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Warrant should be applied when the weather is warm; lower temperatures may reduce activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.

Herbicide-Resistant Weed Management

Soybean	Fierce	3–3.75 oz/A	Preplant 14 to 21 days before planting and after final bed preparation	Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Flexstar GT + Group 15 herbicide	3.5–5 pt/A + appropriate rate for Group 15 herbicide	Postemergence until 45 days before soybean harvest	Group 15 herbicides recommended for use in Mississippi soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Injury may occur if rain falls soon after crop emergence. Spray coverage is critical; apply in at least 15 gallons of water per acre.
Cotton	fluometuron	1–2 lb ai/A, depending on soil texture	Preplant or preemergence but before cotton emergence	Use the higher rate on heavier-textured soils. Fluometuron provides only residual control, and control is dependent on herbicide activation and level of infestation. Apply with paraquat at 0.5–0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Cotton	fomesafen	0.25 lb ai/A	Preplant after at least 0.5 inch of rain on medium- or fine-textured soils; preemergence on coarse-textured soils	Apply with paraquat at 0.5 pound of active ingredient per acre if Palmer amaranth is emerged at application. An at-planting application of residual herbicide will be required for in-season Palmer amaranth control if beds are disturbed before planting.
Cotton	fomesafen	0.25 lb ai/A	Post-directed when cotton has at least 4 inches of bark and after last cultivation	Application should be directed at the bottom 2 inches of cotton. Apply with glyphosate and MSMA to improve postemergence control. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate and/or MSMA formulations not preloaded with an adjuvant.
Cotton	flumioxazin	0.064 lb ai/A	See individual crop sections for specific application timings	Flumioxazin provides only residual control, and control is dependent on herbicide activation and level of infestation.
Corn, cotton	glufosinate	0.4-0.79 lb ai/A, depending on crop	Postemergence; see individual crop sections for specific application timings	Use only on LibertyLink crops. Sequential applications should be made 10 to 14 days apart. Apply in at least 10 gallons of water. Avoid application with air induction nozzles. Add residual herbicide in first application for residual control.
Soybean	glufosinate + fomesafen + Group 15 herbicide	0.53 lb ai/A + 0.375 lb ai/A + appropriate rate for Group 15 herbicide	Postemergence 7 to 21 days after soybean planting	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Use only on LibertyLink crops. Sequential applications should be made 10 to 14 days apart. Apply in at least 10 gallons of water.
Cotton	Gramoxone SL	2 pt/A	Postemergence as late-season salvage application under hooded sprayer	Apply by directing spray between rows using a hooded sprayer. Gramoxone SL should be applied in at least 15 gallons of water and with nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v. Apply with diuron to improve postemergence Palmer amaranth activity and provide residual control.
Corn	Guardsman Max	2.5–4 pt/A, depending on soil texture	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Control is dependent on activation of herbicide and level of weed infestation. Use the higher rate on heavier-textured soils. Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids.
Corn	Halex GT + atrazine	3.6–4 pt/A + 1.5 lb ai/A	Postemergence until corn reaches 12 inches and to Palmer amaranth less than 4 inches	Add nonionic surfactant at 0.25% v/v.
Corn	Lexar EZ	2.25–3 qt/A, depending on soil texture	Preplant, preemergence, or postemergence from 14 days before planting until corn reaches 12 inches	Add glyphosate or glufosinate to improve postemergence control in tolerant hybrids. Add methylated seed oil at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.

Herbicide-Resistant Weed Management

Corn, cotton, soybean	metolachlor or *S*-metolachlor	Formulation dependent	Preemergence or postemergence; see individual crop sections for specific application timings	This herbicide only provides residual control and does not control emerged weeds. Residual control is dependent on activation of herbicide and level of weed infestation. Apply with glyphosate or Sequence (premixture of glyphosate and *S*-metolachlor) alone.
Soybean	metribuzin + Group 15 herbicide	5.33–10.67 oz/A, depending on soil texture + appropriate rate of Group 15 herbicide	Preemergence up to 7 days before planting	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Corn, cotton, soybean	pendimethalin	Formulation and soil texture dependent	Preemergence or postemergence; see individual crop sections for specific application timings	The herbicide only provides residual control and does not control emerged weeds. Residual control is dependent on activation of herbicide and level of weed infestation. Apply with paraquat at 0.5–0.75 pound of active ingredient per acre during preemergence application if Palmer amaranth is emerged at application.
Soybean	Prefix + glyphosate	2 pt/A + formulation dependent	Postemergence when soybean has one to two trifoliate leaves	Prefix provides partial control of emerged Palmer amaranth, with level of control dependent on weed size (no more than four leaves).
Cotton	prometryn	0.5 lb ai/A	Post-directed once or twice after cotton is 3 inches tall	Avoid contact with cotton foliage. Prometryn provides some residual control in addition to controlling emerged weeds. Apply with MSMA at 1 pound of active ingredient per acre to improve control of emerged Palmer amaranth.
Soybean	Sharpen + Group 15 herbicide	1–1.5 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Sonic + Group 15 herbicide	6.45–8 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Soybean	Surveil + Group 15 herbicide	3.5–4.2 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Cotton, soybean	trifluralin	0.5–0.75 lb ai/A	Preplant incorporated; in-season control optimized with applications immediately before planting	Control is dependent on activation of herbicide and level of weed infestation. Use the higher rate on heavier-textured soils. Incorporate 1 to 2 inches deep immediately after application for best results. A 30% loss can occur if incorporation is delayed 24 hours.
Soybean	Valor XLT + Group 15 herbicide	3 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides recommended for use in Mississippi soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce Warrant activity. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.

Herbicide-Resistant Weed Management

Soybean	Verdict + Group 15 herbicide	5–7.5 oz/A + appropriate rate for Group 15 herbicide	Preplant 14 to 21 days before planting and after final bed preparation	Group 15 herbicides for soybeans include metolachlor or *S*-metolachlor, Warrant, and Zidua. Lower temperatures may reduce activity Warrant. Apply with paraquat at 0.75 pound of active ingredient per acre if Palmer amaranth is emerged at application.
Rhizome johnsongrass (glyphosate-resistant)				
Cotton, soybean	clethodim	0.094–0.25 lb ai/A or 0.07–0.188 lb ai/A	Postemergence to emerged johnsongrass	Apply to johnsongrass before it reaches 25 inches. Reduced level of control can be expected on larger johnsongrass. Apply a sequential application if needed, but apply to johnsongrass no larger than 18 inches. Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Cotton, soybean	Fusilade DX	12 oz/A followed by 8 oz/A to control regrowth	Postemergence to johnsongrass less than 18 inches with 12 oz/A and less than 12 inches for sequential application	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Corn	nicosulfuron	Dependent on formulation and johnsongrass size at application	Postemergence to johnsongrass from 12 to 18 inches	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant. If applied with glyphosate formulation preloaded with an adjuvant, no additional adjuvant is required.
Cotton, soybean	quizalofop	0.0688 lb ai/A for single application followed by 0.048 lb ai/A to control regrowth	Postemergence to johnsongrass from 10–24 inches and from 6–10 inches for sequential application	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Cotton, soybean	sethoxydim	0.188 lb ai/A followed by 0.188 lb ai/A to control regrowth	Postemergence to johnsongrass less than 20 inches with 24 oz/A rate and less than 10 inches with sequential application	Add nonionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v if applying alone or with a glyphosate formulation not preloaded with an adjuvant.
Rice flatsedge (ALS-resistant)				
Rice	Basagran	1.5–2 pt/A, depending on rice flatsedge size	Postemergence to emerged rice flatsedge and at least 24 hours before flooding	Add crop oil concentrate at 1% v/v. Do not apply to submerged weeds. The addition of propanil may improve rice flatsedge control. A sequential application may be utilized, but the total Basagran rate should not exceed 4 pints per acre in a single season.
Rice	propanil	3–6 lb ai/A, depending on rice flatsedge size	Postemergence to emerged rice flatsedge	Add crop oil concentrate at 1% v/v if using an SC propanil formulation. Sequential applications may be needed for complete control. The addition of Basagran may improve rice flatsedge control.
Rice	RiceBeaux	4 qt/A	Postemergence to emerged rice flatsedge	Soil should be moist at the time of application and not allowed to crack after application. Sequential applications with Basagran and/or propanil may be needed for complete control.

Herbicide Modes of Action

	HRAC site group of action	Chemical family	Active ingredient	WSSA group
A	Inhibition of acetyl CoA carboxylase (ACCase)	Aryloxyphenoxy-propionate "FOPs"	clodinafop-propargyl cyhalofop-butyl diclofop-methyl fenoxaprop-P-ethyl fluazifop-P-butyl	1
		Cyclohexanedione "DIMs"	clethodim sethoxydim tralkoxydim	
		Phenylpyrazoline "DEN"	pinoxaden	
B	Inhibition of acetolactate synthase ALS (acetohydroxy acid synthase AHAS)	Sulfonylurea	chlorimuron-ethyl chlorsulfuron foramsulfuron halosulfuron-methyl iodosulfuron mesosulfuron metsulfuron-methyl nicosulfuron orthosulfamuron primisulfuron-methyl prosulfuron rimsulfuron sulfosulfuron thifensulfuron-methyl tribenuron-methyl trifloxysulfuron	2
		Imidazolinone	imazapic imazamox imazapyr imazaquin imazethapyr	
		Triazolopyrimidine	cloransulam-methyl diclosulam florasulam flumetsulam penoxsulam pyroxsulam	
		Pyrimidinyl(thio)benzoate	bispyribac-Na pyrithiobac-Na	

Herbicide Modes of Action

C1	Inhibition of photosynthesis at photosystem II	Triazine	atrazine prometon propazine simazine	5
		Triazinone	hexazinone metribuzin	
		Uracil	bromacil terbacil	
C2	Inhibition of photosynthesis at photosystem II	Urea	diuron fluometuron (see F3) linuron siduron tebuthiuron	7
		Amide	propanil	
C3	Inhibition of photosynthesis at photosystem II	Nitrile	bromoxynil	6
		Benzothiadiazinone	bentazon	
D	Photosystem-I-electron diversion	Bipyridylium	diquat paraquat	22
E	Inhibition of protoporphyrinogen oxidase (PPO)	Diphenylether	acifluorfen-Na fomesafen lactofen oxyfluorfen	14
		N-phenylphthalimide	flumioxazin flumiclorac-pentyl	
		Thiadiazole	fluthiacet-methyl	
		Oxadiazole	oxadiazon	
		Triazolinone	carfentrazone-ethyl sulfentrazone	
F1	Bleaching: Inhibition of carotenoid biosynthesis at the phytoene desaturase step (PDS)	Pyridazinone	norflurazon	12
		Other	fluridone	
F2	Bleaching: Inhibition of 4-hydroxyphenyl-pyruvate-dioxygenase (4-HPPD)	Triketone	mesotrione	27
		Isoxazole	isoxaflutole	
F4	Bleaching: Inhibition of carotenoid biosynthesis (unknown target)	Isoxazolidinone	clomazone	13
		Urea	fluometuron (see C2)	

Herbicide Modes of Action

G	Inhibition of EPSP synthase	Glycine	glyphosate	9
H	Inhibition of glutamine synthetase	Phosphinic acid	glufosinate-ammonium	10
I	Inhibition of DHP (dihydropteroate) synthase	Carbamate	asulam	18
K1	Microtubule assembly inhibition	Dinitroaniline	benefin ethalfluralin oryzalin pendimethalin trifluralin	3
		Pyridine	dithiopyr thiazopyr	
		Benzamide	propyzamide = pronamide	
		Benzoic acid	DCPA = chlorthal-dimethyl	
K3	Inhibition of VLCFAs (see Remarks) (Inhibition of cell division)	Chloroacetamide	acetochlor alachlor butachlor dimethanamid metolachlor	15
		Isoxazoline	pyroxasulfone	
		Acetamide	napropamide	
		Oxyacetamide	flufenacet	
L	Inhibition of cell wall (cellulose) synthesis	Nitrile	dichlobenil	20
		Benzamide	isoxaben	21
N	Inhibition of lipid synthesis (not ACCase inhibition)	Thiocarbamate	EPTC thiobencarb	8
		Phosphorodithioate	bensulide	
		Benzofuran	ethofumesate	
O	Action like indole acetic acid (synthetic auxins)	Phenoxy-carboxylic-acid	2,4-D 2,4-DB MCPA	4
		Benzoic acid	dicamba	
		Pyridine carboxylic acid	clopyralid fluroxypyr picloram triclopyr	
		Quinoline carboxylic acid	quinclorac	
P	Inhibition of auxin transport	Phthalamate	naptalam	19
		Semicarbazone	diflufenzopyr	

Herbicide Modes of Action

Z	Unknown herbicide mode of action	Organoarsenical	DSMA MSMA	17
		Other	dazomet fosamine metam oleic acid pelargonic acid	

Rotational Crop Restrictions

Many herbicides used in various crops have planting restrictions. When considering a rotational crop, the following table will help you choose the proper herbicide for the current year. If a rotational crop is planted within the interval stated, or before the interval has expired, unacceptable injury to the rotational crop can occur.

	Rotation Interval[1]						
Herbicides	**Corn**	**Cotton**	**Grain sorghum**	**Rice**	**Soybeans**	**Wheat**	**Other grains**
2,4-D	none	30 d	29 d	30 d	15 d	7 d	1 m
Acetochlor	none	none	30 d	2 y	none	4 m	ns
Aim	none	none	none	none	none	none	none
Anthem	none	4 m	1 y	2 y	none	6 m	1.5 y
Anthem ATZ	none	1.5 y	1.5 y	1.5 y	1.5 y	1.5 y	1.5 y
Armezon/Impact	none	9 m	9 m	3 m	9 m	3 m	3 m
Atrazine[2]	none	ns	none	2 y	ns	1 y	1 y
Authority MTZ	10 m	18 y	18 y	10 m	none	4 m	4 m
Authority XL — pH ≤ 7	10 m	1 y	10 m	10 m	none	4 m	4 m
Authority XL — pH > 7	1.5 y	1.5 y	1.5 y	1.5 y	none	4 m	4 m
Axial XL	3 m	3 m	3 m	3 m	3 m	none	3 m
Axiom	none	8 m	1 y	1 y	none	7 d	1 y
Basagran	none	none	none	none	none	none	none
Beyond	8.5 m	9 m	9 m	9 m	none	3 m	9 m
Bolero	6 m	6 m	6 m	none	6 m	6 m	6 m
Boundary	4 m	1 y	1 y	8 m	none	4.5 m	8 to 12 m
Broadhead	1 y	1 y	1 y	none	1 y	1 y	1 y
Callisto	none	10 m	none	1.5 y	10 m	4 m	4 m
Canopy EX	7 m	10 m	12 m	10 m	none	4 m	4 m
Canopy — pH ≤ 7	10 m[3]	10 m	10 m	10 m	none	4 m	4 m
Canopy — pH > 7 (>3 oz/A)	1.5 y	1.5 y	1.5 y	1.5 y	none	4 m	4 m
Capreno	none	10 m	10 m[4]	1.5 y	10 m	4 m	1.5 y
Classic	7 m	8 m	9 m	9 m	none	3 m	3 m
Clearpath	10 m	1.5 y	1.5 y	1.5 y	10 m	10 m	10 m
Clethodim	1 m	none	1 m	1 m	none	1 m	1 m
Clincher SF	3 m	3 m	3 m	none	3 m	3 m	3 m
Cobra	none	none	none	none	none	none	none
Clomazone	9 m	none[5]	9 m	none	none	1 y	1 y
Corvus	none	10 m	17 m[6]	10 m	9 m	4 m	17 m[6]
Dicamba[7]	none	21 d	15 d	15 d	15 to 28 d	15 d	15 d
Diuron							
PRE, banded	none	none	none	4 m	4 m	4 m	4 m
PRE, broadcast	none	none	none	6 m	6 m	6 m	6 m
POE	none	none	none	1 y	1 y	1 y	1 y
Duet	2 m	2 m	2 m	none	2 m	2 m	2 m
Enlite	9 m	9 m	9 m	9 m	none	4 m	4 m

Rotational Crop Restrictions

	Rotation Interval[1]						
Herbicides	**Corn**	**Cotton**	**Grain sorghum**	**Rice**	**Soybeans**	**Wheat**	**Other grains**
Envive — pH ≤ 7	10 m	10 m	10 m	9 m	none	4 m	4 m
Envive — pH > 7	1.5 y	2.5 y	1.5 y	10 to 18 m	none	4 m	4 m
Envoke	7 m	7 m	7 m	7 m	7 m	3 m	1.5 y
Fierce	1 m[8]	2 m	1 y	1 y	none	2 m	1 y
Finesse Cereal & Fallow	18 m	18 m	18 m	18 m	18 m	none	10 m
FirstRate	9 m	9 m	9 m	9 m	none	3 m	9 to 12 m
Firstshot	14 d	14 d	14 d	none	7 d	none	none
Flumioxazin[9]	1 m	1 m	1 m	1 m	none	1 m	3–8 m
Fluometuron	8 m	none	9 m	9 m	9 m	3 m	9 m
Fomesafen	10 m	none[10]	10 m	10 m	none	4 m	4 m
Fusilade DX	2 m	none	2 m	2 m	none	2 m	2 m
Glufosinate	none	none	6 m	none	none	2 m	2 m
Glyphosate	none	none	none	none	none	none	none
Goal 2XL	10 m	1 m	10 m	10 m	1 m	10 m	10 m
Grandstand	4 m	4 m	4 m	21 d	4 m	4 m	4 m
Grasp	3 m	3 m	3 m	none	3 m	3 m	3 m
Grasp Xtra	3 m	3 m	3 m	none	3 m	3 m	3 m
Guardsman Max	11 m	ns	ns	2 y	ns	1 y	1 y
Halex GT	none	10 m	none	1.5 y	10 m	4 m	4 m
Harmony Extra	14 d	14 d	14 d	none	14 d	none	2 m
Laudis	none	10 m	10 m	10 m	8 m	4 m	4 m
League	1 y	8 m	1 y	none	1 y	1 y	2 y
Lexar EZ	none	spring	spring	1.5 y	spring	spring	spring
Layby Pro	4 m	4 m	8 m	1 y	8 m	1 y	1 y
Linuron	none	4 m	none	1 y	none	4 m	4 m
Londax	4 m	4 m	4 m	none	4 m	4 m	4 m
Marksman	none	ns	none	ns	ns	10 m	10 m
Metolachlor/*S*-metolachlor	none	none	spring[11]	spring	none	4.5 m	spring
Metribuzin	4 m	1.5 y	1.5 y	1 y	none	4 m	1.5 y
MSMA	none	none	none	none	none	none	none[12]
Newpath[13]	8.5 m	1.5 y	1.5 y	1.5 y	none	4 m	1.5 y
Nicosulfuron	none	10 m	10 to 18 m[14]	10 to 18 m	15 d	4 m	4 m
Obey	10 m	10 m	10 m	none	10 m	10 m	10 m
Outlook	none	ns	ns	ns	none	4 m	4 m
Paraquat	none	none	none	none	none	none	none
Pendimethalin	none	none	10 to 12 m	none	none	4 m	ns
Permit	1 m	4 m	2 m	none	9 m	2 m	2 m
Permit Plus	1 m	4 m	2 m	none	2 m	2 m	2 m

Rotational Crop Restrictions

	Rotation Interval[1]						
Herbicides	**Corn**	**Cotton**	**Grain sorghum**	**Rice**	**Soybeans**	**Wheat**	**Other grains**
Prefix	10 m	1 m	10 m	10 m	none	4.5 m	4.5 m
Prometryn	5 m	none	1 y	1 y	1 y	1 y	1 y
Propanil	2 m	2 m	2 m	none	2 m	2 m	2 m
Python	none	1.5 y	1 y	6 m	none	4 m	4 to 18 m
Quinclorac	10 m	10 m	none	none	10 m	none	10 m
Quizalofop	4 m	none	4 m	4 m	none	4 m	4 m
Realm Q	none	10 m	10 m	1.5 y	10 m	9 m	9 m
Regiment	ns	ns	ns	none	ns	ns	none
Ricestar HT	1 m	1 m	1 m	none	1 m	4 m	4 m
Scepter	9.5 m	1.5 y	11 m	spring	none	4 m	1.5 y
Sequence	none	none	none	9 m	none	4.5 m	4.5 m
Sethoxydim	1 m	none	1 m	1 m	none	1 m	1 m
Sharpen[15]	none	1.5 to 9 m	0 to 1 m	0 to 4 m	0 to 6 m	none	none
Solicam DF	2 y	1 m	2 y	2 y	1.5 m	2 y	2 y
Sonic	10 m	12 to 18 m	1 y	10 m	none	4 m	2.5 y
Spartan Charge	4 to 12 m	12 to 18 m	10 to 18 m	10 m	none	4 m	1 y
Status	7 d	1 m	1 m	1 m	1 m	1 m	1 m
Staple LX	10 m[16]	none	2 y	9 m	10 m	4 m	10 m
Storm	3 m	3 m	3 m	none	none	1 m	1 m
Strada	3 m	6 m	12 m	none	6 m	3 m	3 m
Strada PRO	3 m	6 m	36 m	none	9 m	3 m	3 m
Strada XT2	11 m	11 m	11 m	none	11 m	11 m	11 m
Suprend	7 m	7 m	7 m	7 m	7 m	3 m	1.5 y
Trifluralin	1 y	none	1 y	1 y	none	1 y	1 y
Ultra Blazer	3 m	3 m	3m	none	none	1 m	1 m
Valor XLT — pH ≤ 7	10 m	10 m	10 m	9 m	none	4 m	4 m
Valor XLT — pH > 7	1.5 y	2.5 y	1.5 y	1.5 y	none	4 m	4 m
Verdict	none	ns	ns	ns	0 to 4 m	4 m	4 m
Warrant	ns	ns	ns	ns	none	4 m	ns
Zidua	none	4 m	1.5 y	10 to 18 m[17]	none	4 m	11 m

[1] d = days after application; m = months after application; y = years after application; spring = spring following application; and ns = next season. PRE = preemergence application and POE = postemergence application.

[2] If applied after June 10, injury may occur if you rotate to any crop other than corn or grain sorghum the year after application.

[3] Fields may be recropped to field corn after 9 months if Canopy rate does not exceed 6 ounces per acre.

[4] Increase the rotational interval for grain sorghum to 18 months if pH is 7.5 or greater or if Capreno rate exceeded 3 ounces per acre.

[5] Do not plant cotton unless disulfoton or phorate organophosphate insecticide is applied in-furrow with the seed at a minimum of 0.75 pound of active ingredient per acre.

[6] Increase the rotation interval to 24 months if pH is 7.5 or greater.

[7] Rotation restrictions are for the use rate of 8 ounces per acre. At least 1 inch of rainfall or overheard irrigation is required before waiting interval begins.

[8] The rotation interval may be decreased to 7 days for minimum and no-till corn if the Fierce rate does not exceed 3 ounces per acre.

Rotational Crop Restrictions

[9] This applies to applications of 0.064 pound active ingredient per acre or less; additionally, 1 inch of rainfall or irrigation must occur between application and planting.
[10] At least 0.5 inch of rainfall or overhead irrigation must occur before planting cotton.
[11] Replant only with Concept-treated or Screen-treated seed.
[12] Barley, oats, and rye may be replanted after 4 months.
[13] For Newpath use rates greater than 8 ounces per acre per season up to 12 ounces per acre per season, only soybean may be planted the following year.
[14] Grain sorghum or rice may be planted 10 months after nicosulfuron application on soils with pH of no more than 7.5 or 6.5, respectively. If soil pH is greater than 7.5 or 6.5, do not plant grain sorghum or rice, respectively, for 18 months.
[15] Rotation restrictions are rate dependent. Consult the label for more information.
[16] Corn may be planted 10 months after Staple LX application was made in cotton, providing that the total amount of Staple LX from all applications does not exceed 3.8 fluid ounces per acre. No additional soil mixing is required beyond that normally performed for a production system.
[17] Rotation restrictions are dependent on the rate of Zidua used. Consult the label for more information.

Soybean Weed Management

Weed Response Ratings for Herbicides Applied in Burndown Prior to Soybean Planting[1]

	Annual bluegrass	Bittercress	Buttercup	Carolina geranium	Chickweed	Eveningprimrose	Henbit	Prostrate knotweed	Shepherdspurse	Wildlettuce	Virginia pepperweed	Vetch	Little barley	Horseweed	Curly dock (mature)	Italian ryegrass	Barnyardgrass	Broadleaf signalgrass	Crabgrass	Goosegrass	Seedling johnsongrass	Cocklebur	Entireleaf morngglory	Pitted morngglory	Smallflower morng.	P. smartweed	Hemp sesbania	Prickly sida	Spurred anoda	Pigweed	Sicklepod	Cutleaf groundcherry	Common ragweed	Red rice	Upright spurge	Soil activity
2,4-D	0	**8**	**9**	7	**8**	**10**	5	**8**	**8**	**9**	**9**	**9**	0	**8**	7	0	0	0	0	0	0	**8**	**10**	**10**	**9**	**8**	**8**	**8**	**9**	**9**	**8**	**9**	-	0	-	yes
Dicamba	0	**8**	**9**	**8**	**8**	**10**	7	**8**	**8**	**9**	**9**	**9**	0	**9**	**9**	0	0	0	0	0	0	**9**	**10**	**10**	**9**	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	0	**9**	yes
FirstShot	0	**9**	**9**	**8**	**8**	**8**	7	-	**9**	**9**	**9**	**9**	0	6	**9**	0	0	0	0	0	0	**8**	7	**8**	**8**	-	6	4	-	6	4	-	-	0	-	no
Glufosinate	6	-	-	**8**	**10**	7	6	-	-	-	**9**	**8**	7	**9**	-	6	**8**	**8**	**8**	**8**	**8**	**9**	**10**	**10**	**9**	**8**	**8**	7	-	**8**	7	-	-	-	-	no
Glyphosate	**10**	**10**	**9**	7	**10**	6	7	7	**10**	**8**	**8**	5	**10**	**8**	6	6	**10**	**10**	**10**	**9**	**10**	**8**	7	**8**	**8**	7	6	7	6	**10**	**8**	**9**	**9**	**8**	**10**	no
Glyphosate + 2,4-D	**10**	**10**	**10**	**9**	**10**	**9**	**8**	**-**	**10**	**10**	**9**	5	**10**	**9**	**8**	7	**9**	**9**	**10**	**9**	**9**	**10**	**9**	**9**	**9**	**8**	**8**	**8**	**8**	**10**	**8**	**9**	**9**	**8**	**10**	yes
Glyphosate + Canopy EX	**9**	**9**	**8**	7	**8**	7	**8**	-	**8**	-	-	**8**	**8**	7	**8**	6	**9**	**9**	**10**	**9**	**10**	**8**	**8**	**9**	**9**	7	**8**	**8**	**9**	**8**	**8**	**8**	**9**	**9**	**9**	yes
Glyphosate + dicamba	**10**	**10**	**10**	**9**	**10**	**8**	**8**	**-**	**10**	**10**	**9**	**9**	**10**	**8**	**8**	7	**9**	**9**	**10**	**9**	**9**	**10**	**9**	**9**	**9**	**8**	**9**	**8**	**8**	**9**	**8**	**9**	**9**	**8**	**10**	yes
Glyphosate + Envive	**10**	**10**	**10**	**8**	**10**	**8**	**9**	**-**	**9**	**-**	**-**	**-**	**10**	**9**	**-**	**9**	**10**	**10**	**10**	**9**	**10**	**8**	**8**	**8**	**8**	**9**	**-**	**-**	**-**	**10**	**8**	**9**	**9**	**9**	**10**	yes
Glyphosate + FirstShot SG	**10**	**10**	**10**	**8**	**10**	7	**9**	-	**10**	**9**	**10**	**9**	**10**	**8**	**9**	7	**10**	**10**	**10**	**9**	**10**	**8**	**8**	**9**	**9**	**10**	7	-	-	**10**	**8**	-	-	-	-	no
Glyphosate + flumioxazin	**10**	**10**	**10**	**8**	**10**	**8**	**9**	-	**9**	-	-	-	**10**	**8**	-	**9**	**10**	**10**	**10**	**9**	**10**	**8**	**8**	**8**	**8**	**9**	-	-	-	**10**	**8**	**9**	**9**	**9**	**10**	yes
Glyphosate + Goal 2XL	**10**	**10**	**10**	**8**	**10**	7	**9**	-	**10**	-	**10**	7	**10**	**8**	7	**8**	**9**	**9**	**9**	**8**	**9**	**8**	**9**	**9**	**9**	**8**	**10**	**9**	**9**	**10**	**8**	**9**	**9**	-	**10**	yes
Glyphosate + Leadoff	**10**	**7**	**9**	**9**	**9**	6	7	-	**9**	-	-	-	**10**	6	**9**	**8**	**10**	**10**	**10**	**9**	**10**	**8**	**8**	**8**	**8**	7	7	7	-	**10**	**8**	-	-	-	-	yes
Glyphosate + Sharpen	**10**	**10**	**9**	7	**10**	7	7	7	**10**	**9**	**8**	5	**10**	**9**	6	6	**10**	**10**	**10**	**9**	**10**	**8**	7	**8**	**8**	**8**	**8**	7	6	**10**	**8**	**9**	**9**	**8**	**10**	yes
Glyphosate + Synchrony XP	**10**	**10**	**9**	**8**	**9**	**8**	**8**	-	**9**	**9**	**9**	**9**	**10**	**8**	**9**	7	**10**	**10**	**10**	**9**	**10**	**9**	**8**	**8**	**9**	**9**	7	7	-	**9**	7	**8**	**9**	**8**	**9**	yes
Goal 2XL	**9**	**10**	**9**	**8**	**8**	4	**9**	**9**	**9**	**9**	**8**	7	-	6	-	5	-	-	-	-	-	**8**	**8**	**9**	**9**	**8**	**9**	**9**	**8**	**9**	-	-	-	-	**9**	yes
Metribuzin	**9**	**10**	**9**	7	**10**	6	**8**	6	**9**	**8**	6	6	**10**	5	-	6	7	**8**	7	7	**8**	7	7	7	7	**8**	**9**	**8**	**8**	**8**	7	7	**8**	4	4	yes
Paraquat	**10**	**10**	**10**	7	**10**	7	**9**	6	**9**	7	7	**8**	**8**	6	4	**8**	**9**	**9**	**9**	**8**	**9**	6	5	5	7	6	6	6	**8**	**9**	**9**	7	**8**	7	**8**	no
Paraquat + 2,4-D	**10**	**10**	**10**	**9**	**10**	**10**	**9**	-	**9**	-	**8**	**10**	**9**	**9**	**8**	6	-	-	-	-	-	-	-	-	-	**10**	-	**8**	-	**9**	-	-	-	-	-	yes
Paraquat + Goal 2XL	**10**	**10**	**10**	**10**	**10**	7	**9**	-	**10**	-	5	**9**	**10**	**8**	5	6	-	-	-	-	-	-	-	-	-	7	-	-	-	**10**	-	-	-	-	**9**	yes
Paraquat + metribuzin	**10**	**10**	**10**	**8**	**10**	**8**	**9**	6	**9**	**8**	**8**	**8**	**10**	**9**	-	**9**	**9**	**9**	**9**	**8**	**9**	7	7	7	7	**8**	**9**	**8**	**8**	**9**	**9**	7	**8**	7	**8**	yes

Rating Scale: 0–3 = none to slight; 4–6 = fair; 7–8 = good; 9–10 = excellent.

[1]Control expected under optimum conditions. Mississippi State University does not guarantee these estimates since many factors cause herbicide performance to vary. Resistance to recommended use rates of some herbicides has been identified in certain weed species in Mississippi.

Soybean Weed Management

Weed Response Ratings for Soybean Herbicides Applied Preemergence[1]

	Barnyardgrass	Broadleaf signalgras	Crabgrass	Goosegrass	Seedling johnsongrass	Rhizome johnsongrass	Fall panicum	Cocklebur	Entireleaf morningglory	Pitted morningglory	Palmleaf morningglory	Smallflower morningglory	Purple moonflower	Purslane	Pennsylvania smartweed	Hemp sesbania	Prickly sida	Spured anoda	Pigweed, smooth, redroot	Palmer, spiny amaranth, waterhemp	Balloonevine	Sicklepod	Cuutleaf groundcherry	Common ragweed	Yellow nutsedge	Velvetleaf	Jimsonweed	Spurge	Hophornbeam copperleaf	Showy crotolaria	Wild poinsettia	Volunteer glyphosate-resistant corn	Crop tolerance (*G = good, F = fair*)
PPI-Preplant-Incorporated[2]																																	
Pendimethalin or Trifluralin	**9**	**9**	**9**	**9**	**9**	3	**9**	0	2	2	2	2	1	**9**	2	0	0	0	**8**	7	1	4	-	-	**8**	4	5	-	-	3	-	-	G
Pendimethalin-2X or Trifluralin-2X	**10**	**10**	**10**	**10**	**9**	7	**9**	0	4	4	4	4	3	**10**	2	1	2	0	**9**	**8**	0	3	1	4	0	3	4	3	0	0	0	-	G
Preplant or Preemergence																																	
Authority MTZ	6	6	6	5	4	0	6	7	**9**	**9**	**9**	**9**	-	**8**	**9**	**8**	**8**	-	**9**	**9**	-	7	-	**8**	7	**8**	**8**	**8**	**9**	-	**9**	-	F
Authority XL	6	6	6	5	5	2	6	**9**	**9**	**9**	**9**	**9**	-	**8**	**9**	5	4	-	**9**	**9**	-	6	-	**8**	**9**	**9**	**8**	**8**	**9**	-	**9**	-	F
Boundary	**8**	**8**	**8**	**8**	6	0	**8**	5	3	7	7	**8**	5	**9**	**9**	**9**	**9**	**9**	**9**	**8**	**9**	7	**9**	**9**	7	**8**	**8**	**9**	**9**	6	6	-	**F**
Canopy DF	7	6	7	7	7	3	7	**9**	**8**	**8**	**8**	**9**	6	**10**	**9**	**9**	**9**	**9**	**9**	**8**	**8**	7	**9**	**9**	5	**9**	**8**	**9**	**8**	-	**8**	-	F
Canopy EX	**8**	**8**	7	7	6	2	7	**8**	**8**	**8**	**8**	**8**	-	**8**	**9**	**9**	7	-	**8**	**8**	-	-	-	**8**	**8**	7	5	**8**	-	**8**	0	-	G
Clomazone	**9**	**9**	**9**	**9**	**9**	3	**8**	6	4	7	6	6	3	**9**	**8**	4	**9**	**9**	4	0	5	0	0	5	-	**10**	**8**	**8**	**8**	3	**9**	-	G
Envive	6	5	6	5	5	0	6	**9**	**9**	**9**	**9**	6	**9**	**9**	**8**	**8**	**8**	**9**	**9**	**9**	7	7	5	**9**	7	5	**8**	**8**	**9**	**9**	-	-	F
Fierce	7	7	7	6	5	3	7	3	7	7	5	7	7	8	**8**	**8**	**9**	**8**	**9**	**8**	7	7	7	7	5	**8**	**8**	**9**	**8**	-	**9**	2	F
Flumioxazin	5	5	5	5	5	0	6	0	**8**	**8**	**8**	6	**9**	6	**9**	**9**	**8**	**8**	**8**	**8**	7	7	5	**9**	7	5	**8**	**8**	**9**	**9**	-	-	F
Fomesafen	4	3	4	4	4	0	-	7	5	**8**	6	5	4	7	7	4	**8**	1	**8**	**8**	-	**7**	**8**	**7**	**7**	-	**4**	-	-	-	**6**	-	G
Intimidator	**8**	**8**	**8**	**8**	6	0	**8**	5	3	7	7	**8**	5	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	7	**9**	**9**	7	**8**	**8**	**9**	**9**	6	6	-	F
Metolachlor/*S*-metolachlor	**8**	**8**	**9**	**9**	6	0	**9**	0	0	0	0	0	0	**9**	4	0	4	0	**9**	7	1	2	6	6	**9**	4	**8**	5	2	3	-	-	G
Metribuzin	**8**	6	**8**	7	5	0	7	6	2	7	2	**8**	6	**9**	**9**	**9**	**9**	**9**	**9**	7	**9**	**8**	**9**	**9**	2	**8**	**8**	**9**	**9**	7	7	-	F
Outlook	**8**	**8**	**9**	**9**	6	0	**9**	0	0	0	0	0	0	**9**	4	0	4	0	**9**	6	1	3	4	**9**	5	4	3	**8**	3	5	-	-	G
Pendimethalin	**9**	**9**	**9**	**9**	**9**	3	**9**	0	2	2	2	2	1	**9**	2	0	4	0	**8**	6	0	2	0	3	0	2	3	2	0	0	0	-	G
Prefix	**9**	**8**	**9**	**9**	7	0	3	5	5	5	5	4	**9**	6	4	7	4	**9**	**8**	**9**	-	5	**9**	**9**	**9**	6	**8**	**9**	6	4	-	-	G
Python	0	0	0	0	0	0	0	**8**	5	7	7	**8**	-	**9**	**9**	0	**9**	**9**	**9**	6	3	7	**9**	**8**	-	**9**	-	**9**	7	3	6	-	G
Scepter	7	7	7	5	7	2	5	**9**	6	**8**	**8**	**8**	5	**9**	**9**	0	**9**	7	**10**	6	**5**	5	-	7	4	6	**8**	6	7	-	7	-	G
Solicam	**8**	**8**	**9**	**8**	7	2	7	4	4	5	5	4	4	**9**	5	4	**8**	7	**8**	7	-	5	-	-	4	7	-	**8**	-	-	-	-	F
Sonic	5	5	5	5	5	0	5	7	**8**	**9**	**8**	7	7	**9**	**9**	-	7	**8**	**9**	7	-	-	**8**	**8**	7	**8**	**8**	**8**	**8**	-	7	6	G
Valor XLT	6	5	6	5	5	0	6	**9**	**9**	**9**	**9**	6	**9**	**9**	**8**	**8**	**8**	**9**	**9**	**9**	7	7	5	**9**	**8**	5	**9**	6	**9**	**9**	-	-	F
Warrant	**8**	**8**	7	7	5	3	**9**	0	0	0	0	0	0	**9**	4	0	5	2	**8**	6	-	3	**9**	5	7	3	4	3	-	3	3	-	G
Zidua	**9**	**9**	**9**	**8**	7	4	**8**	3	6	6	6	6	-	**9**	**8**	6	**8**	-	**9**	**9**	-	7	-	5	4	7	7	**9**	**8**	-	-	0	G

Rating Scale: 0–3 = none to slight; 4–6 = fair; 7–8 = good; 9–10 = excellent.

[1]Control expected under optimum conditions. Mississippi State University does not guarantee these estimates since many factors cause herbicide performance to vary. Resistance to recommended use rates of some herbicides has been identified in certain weed species in Mississippi.

[2]An overlay treatment with the preemergence herbicides will control a broader spectrum of weeds, but the effectiveness on any given species may be no better than the highest rating for the best herbicide in the specific combination selected.

Soybean Weed Management

Weed Response Ratings for Soybean Herbicides Applied Postemergence[1]

	Barnyardgrass	Broadleaf signalgras	Crabgrass	Goosegrass	Seedling johnsongrass	Rhizome johnsongrass	Fall panicum	Cocklebur	Entireleaf morningglory	Pitted morningglory	Palmleaf morningglory	Smallflower morningglory	Purple moonflower	Purslane	Pennsylvania smartweed	Hemp sesbania	Prickly sida	Spured anoda	Pigweed, smooth, redroot	Palmer, spiny amaranth, waterhemp	Balloonevine	Sicklepod	Cuutleaf groundcherry	Common ragweed	Yellow nutsedge	Velvetleaf	Jimsonweed	Spurge	Hophornbeam copperleaf	Showy crotolaria	Wild poinsettia	Volunteer glyphosate-resistant corn	Crop tolerance *(G = good, F = fair)*
Assure II	**9**	**9**	**9**	**8**	**9**	**9**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**	G
Basagran	0	0	0	0	0	0	0	**9**	2	6	7	**9**	3	7	**9**	4	**8**	**8**	5	4	**8**	0	6	**9**	6	**9**	**8**	0	0	0	7	-	G
Basagran + 2,4-DB	0	0	0	0	0	0	0	**9**	5	**8**	**9**	**9**	5	7	**9**	5	**8**	**8**	5	4	**8**	0	6	**9**	6	**9**	**8**	0	0	0	6	-	F
Classic	0	0	0	0	0	0	0	**10**	**9**	**8**	**9**	**8**	**9**	5	**9**	**8**	2	4	**10**	6	5	7	-	**8**	6	**8**	**9**	0	4	-	**8**	-	G
Clethodim	**9**	**9**	**9**	**9**	**9**	**9**	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	G
Cobra	4	4	4	4	3	2	3	**8**	**8**	**9**	**8**	**8**	**9**	**9**	6	**9**	**8**	6	**9**	**8**	**9**	5	**9**	**8**	3	**8**	**9**	**8**	**8**	**9**	**8**	-	F
FirstRate	0	0	0	0	0	0	0	**9**	**8**	**9**	**8**	**9**	-	-	-	3	2	-	2	2	-	7	-	**8**	6	7	-	4	4	-	-	-	G
Fomesafen	3	3	3	3	3	3	2	**8**	**8**	**9**	**8**	**8**	**9**	**8**	7	**9**	2	2	**9**	**8**	**8**	3	**9**	**8**	6	-	**9**	5	**8**	**9**	**8**	-	G
Fusilade DX	**8**	**8**	**8**	**9**	**9**	**9**	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**	G
Glufosinate[2]	7	7	7	5	7	6	7	9	9	9	9	8	-	6	9	8	7	7	8	7	9	8	6	9	4	7	8	8	8	-	-	9	G
Glyphosate[3]	**9**	**9**	**9**	**8**	**10**	**9**	**9**	**10**	7	**8**	**8**	**9**	**8**	**8**	**8**	7	7	7	**9**	**8**	**8**	**8**	**9**	**9**	7	7	**8**	**8**	**8**	**8**	**9**	-	G
Permit Plus[4]	0	0	0	0	0	0	0	**8**	-	-	-	-	-	-	**8**	**9**	-	-	-	-	-	-	-	**8**	**9**	**8**	-	-	-	-	-	0	G
Poast Plus	**8**	**9**	**9**	**9**	**9**	7	**9**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	G
Prefix	3	3	3	3	3	3	2	**8**	**8**	**9**	**8**	**8**	**9**	**8**	7	**9**	2	2	**9**	**8**	**8**	**9**	**8**	6	7	**9**	0	**8**	**9**	**8**	6	-	G
Scepter	2	2	3	3	6	5	5	**10**	5	6	6	7	5	**9**	7	2	3	2	**10**	6	0	3	-	6	5	3	0	3	3	0	7	-	G
Storm	3	4	3	3	3	0	2	**9**	**8**	**9**	**9**	**9**	7	**8**	**8**	**9**	7	7	**8**	**7**	**8**	2	**9**	**9**	6	**8**	**8**	6	7	**9**	6	-	G
Sequence	**9**	**9**	**9**	**8**	**10**	**9**	**9**	**10**	7	**8**	**8**	**9**	**8**	**8**	**8**	7	7	7	**9**	**9**	**8**	**8**	**9**	**9**	**7**	**7**	**8**	**8**	**8**	**8**	**9**	-	G
Synchrony XP4	**8**	**8**	**8**	7	6	0	**9**	**9**	**9**	**9**	**9**	**9**	7	**8**	**8**	**8**	6	-	**8**	**8**	-	-	0	-	7	**8**	7	**8**	7	-	0	-	G
Ultra Blazer	3	4	3	3	3	2	2	5	**8**	**9**	**9**	**8**	**9**	**8**	7	**9**	1	2	**8**	7	**8**	3	**9**	**8**	3	-	**8**	7	**8**	**9**	7	-	G
Ultra Blazer + 2,4-DB	3	4	3	3	3	2	2	7	**8**	**9**	**9**	**8**	**9**	**8**	7	**9**	1	-	**8**	7	**8**	3	**9**	**8**	-	-	**8**	7	**8**	**9**	**8**	-	F
Postemergence-Directed																																	
2,4-DB	0	0	0	0	0	0	0	**9**	**9**	**9**	**9**	**9**	**9**	3	0	3	3	2	2	2	1	0	0	1	0	3	4	0	2	-	3	-	G
Linuron	7	7	**8**	7	7	0	7	7	**8**	**8**	**8**	**8**	7	**8**	7	**8**	**8**	**8**	**8**	**8**	**8**	7	**8**	**8**	-	6	7	7	7	-	7	-	G
Linuron + 2,4-DB	7	7	**8**	7	7	0	7	**9**	**10**	**9**	**9**	**10**	**9**	**9**	7	**8**	**8**	**8**	**9**	**9**	**9**	**9**	**10**	**9**	2	7	**8**	7	**9**	-	**8**	-	G
Metribuzin	7		**8**	7	7	0	-	**8**	7	7	7	7	7	-	7	7	**8**	**8**	**8**	**8**	**8**	**8**	7	7	0	**8**	-	4	-	-	5	-	G
Metribuzin + 2,4-DB	7	7	**8**	7	7	0	-	**9**	**9**	**9**	**9**	**9**	**8**	3	7	7	**8**	**8**	**8**	**8**	**9**	**9**	**8**	**8**	0	**8**	7	4	**8**	-	7	-	G
Paraquat[5]	**9**	**9**	**9**	**8**	**8**	0	**8**	4	5	4	6	7	4	**8**	5	1	4	3	**8**	**8**	2	**8**	7	**8**	3	6	7	5	7	-	**8**	-	G

Rating Scale: 0–3 = none to slight; 4–6 = fair; 7–8 = good; 9–10 = excellent.

[1] Control expected under optimum conditions. Mississippi State University does not guarantee these estimates since many factors cause herbicide performance to vary. Resistance to recommended use rates of some herbicides has been identified in certain weed species in Mississippi.

[2] LibertyLink soybean cultivars only.

[3] Roundup Ready soybean cultivars only.

[4] STS soybean cultivars only.

[5] Two applications.

Soybean Weed Management

Herbicide Rates for Preemergence Application in Soybean

Herbicide	Formulation	Sandy loam, sandy loam	Loam, silt, silt loam, sandy clay, sandy clay loam	Silty clay, clay loam, silty clay loam, clay
Metolachlor	8 EC	1.5 to 2 pt/A	2 to 2.5 pt/A	2 to 2.5 pt/A
S-metolachlor	7.62 EC	1 to 1.33 pt/A	1.33 to 1.67 pt/A	1.33 to 1.67 pt/A
Metribuzin	75 DF	0.33 to 0.5 lb/A	0.5 to 0.67 lb/A	0.67 to 0.83 lb/A
	4 L	0.5 to 0.75 pt/A	0.75 to 1 pt/A	1 to 1.25 pt/A

Herbicide Rates for Controlling Grasses with Postemergence Herbicide Applications

	Fusilade DX			Quizalofop			Poast Plus	
Grass species	**Grass size**	**Rate**		**Grass size**	**Rate**		**Grass size**	**Rate**
Barnyardgrass	1 to 2	12		2 to 6	8		1 to 8	24
Bermudagrass	4 to 8	12		3	10		1 to 6	36
Second application	4 to 8	8		3	7		1 to 4	24
Broadleaf signalgrass	2 to 4	12		2 to 6	8		1 to8	24
Crabgrass	1 to 2	12		2 to 6	8		1 to 6	24
Goosegrass	2 to 4	8		2 to 6	8		1 to 6	24
Red rice	1	16		1 to 4	9		1 to 4	48
Rhizome johnsongrass	8 to 18	12		10 to 24	10		15 to 20	24
Second application	6 to 12	8		6 to 10	7		6 to 10	24
Seedling johnsongrass	2 to 8	6		2 to 8	5		1 to 8	24
Volunteer corn	12 to 24	6		8 to 18	5		12 to 20	24 to 36

Soybean Weed Management

Situation and active ingredient rate per broadcast acre	Formulated product per broadcast acre	Time of application	Weeds controlled	Special instructions and remarks
Preplant				
2,4-D amine – 0.5 to 1 lb/A	Various formulations (see product label for specific rates)	14 to 30 days before planting	Annual, biennial, and perennial broadleaf weeds	Mix with glyphosate, glufosinate, or paraquat to improve weed control spectrum. Ester formulations are usually more effective than amine formulations in controlling curly dock and wild garlic. Apply esters when temperatures are less than 60° and amines when more than 60°. Follow Bureau of Plant Industry regulations for phenoxy herbicides. Apply in 10 to 20 gallons water by ground or 5 gallons water by air.
chlorimuron + tribenuron – 0.02 to 0.04 lb/A	Canopy EX 29.5 WDG — 1.1 to 2.2 oz/A	Preplant or preemergence	Annual broadleaf weeds	Mix with glyphosate, paraquat, or 2,4-D to broaden weed control spectrum. **Do not** apply to Black Belt soils with a pH greater than 7 or a history of nutrient deficiency. Higher rates can be used to control larger weeds or to provide extended residual control. Add a nonionic surfactant at 0.25% v/v or a crop oil concentrate at 1% v/v.
dicamba – 0.25 lb/A	Dicamba (4 lb/gal formulations) — 8 oz/A	At least 15 days before planting	Horseweed, clovers; other annual, biennial, and perennial broadleaf weeds	A minimum accumulation of 1 inch of rainfall or overhead irrigation, followed by a 15-day waiting interval, is required before planting soybean. **Do not** apply this product near emerged soybean. Apply in 10 to 20 gallons water by ground or 5 gallons water by air.
Fallow cultivation	Not applicable	Preplant	Johnsongrass and emerged annual weeds	Use several fallow cultivations over a 4- to 6-week period. Disk-harrow is more effective than field cultivator when used alone for johnsongrass control. Alternate use of both implements is as effective as disking alone.
flumioxazin – 0.032 to 0.08 lb/A	Flumioxazin 51 WDG — 1 to 2.5 oz/A or 4 SC — 1 to 2.6 oz/A	Preplant or preemergence	Annual broadleaf weeds	Mix with glyphosate, paraquat, or 2,4-D to broaden weed control spectrum. **Do not** apply more than 0.096 pounds active ingredient per season. Injury may occur if flumioxazin is used in the same field where flufenacet, alachlor, metolachlor/*S*-metolachlor, or dimethenamid-P will be used preemergence.
flumioxazin + chlorimuron + thifensulfuron – 0.065 to 0.1 lb/A	Envive 41.3 WDG — 2.5 to 4 oz/A	Preplant or preemergence	Annual broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to improve grass and broadleaf control. **Do not** apply preemergence to coarse soils or to Black Belt soils with a pH greater than 7. **Do not** apply more than 4 ounces per season.
glyphosate – 1 to 1.5 lb/A	Various formulations (see product label for specific rates)	Preplant or preemergence	Annual, biennial, and perennial grasses and broadleaf weeds	Use of flood-jets is not suggested. If tillage is intended after treatment, wait at least 3 days (7 days for perennial weeds) after application. Avoid drift to nontarget species or areas. Glyphosate may be mixed with soil-applied herbicides for residual activity.
oxyfluorfen – 0.25 to 0.5 lb/A	Goal 2XL 2 EC — 1 to 2 pt/A	Preplant up to 60 days before planting	Annual broadleaf weeds	Mix with glyphosate, paraquat, or 2,4-D to improve weed control spectrum. Soybean may be planted within 7 days after application if significant rainfall has occurred and the soil has been tilled to incorporate the treatment to a depth of at least 2.5 inches. Add a nonionic surfactant at 0.25 to 0.5% v/v.

Soybean Weed Management

paraquat – 0.63 to 1 lb/A	Various formulations (see product label for specific rates)	Preplant or preemergence	Annual and perennial grasses and broadleaf weeds	**Avoid off-site movement to emerged vegetation.** May be mixed with most preemergence herbicides. Apply in a minimum of 10 gallons of water by ground or 5 gallons by air. Add a nonionic surfactant at 0.25% v/v or a crop oil concentrate at 1% v/v.
rimsulfuron + thifensulfuron – 0.031 + 0.056 lb/A	LeadOff 33.4 WDG — 1.5 to 2.7 oz/A	At least 30 days prior to planting	Annual and perennial grasses and broadleaf weeds	Use a rate of 1.5 ounces per acre for most applications. If the rate exceeds 1.5 ounces, apply 60 days before planting. To prevent injury, plant STS soybean varieties. Best results are obtained when mixed with glyphosate, paraquat, or glufosinate. Add an adjuvant when mixing with products that do not already contain an adjuvant system.
saflufenacil – 0.022 to 0.033 lb/A	Sharpen 2.85 SC — 1 to 1.5 oz/A	Preplant to preemergence; 14-day preplant interval required for 1.5 oz/A rate	Horseweed; other broadleaf weeds	Mix with glyphosate, glufosinate, or paraquat to improve control of other emerged weeds. **Do not** apply more than 4 ounces per year. **Do not** apply after soybean emergence or severe injury may occur. **Do not** apply to coarse soils or those with < 2% organic matter. Add methylated seed oil at 1% v/v plus ammonium sulfate.
thifensulfuron + tribenuron – 0.016 to 0.025 lb/A	FirstShot 50 SG — 0.5 to 0.8 oz/A	At least 7 days before prior to planting	Winter annual and some perennial broadleaf weeds, including curly dock and Pennsylvania smartweed	Mix with glyphosate, paraquat, or 2,4-D to improve weed control spectrum. Sequential applications allowed as long as total applied during a single season does not exceed 1 ounce per acre. When applied on sandy loam, sandy, or silt loam soils, extend time to planting by an additional 7 days. Add a nonionic surfactant at 0.25% v/v or a crop oil concentrate at 1% v/v.
Preplant-incorporated				
pendimethalin – 0.5 to 0.75 to 1.0 lb/A	Prowl H_2O 3.8 CS — 1 to 1.5 to 2 pt/A; or 3.3 EC — 1.2 to 1.8 to 2.4 pt/A	Preplant or preemergence	Annual grasses and some small-seeded broadleaf weeds such as pigweeds and purslane	Immediately incorporate 1 to 2 inches deep. Loss of 15% can be expected if incorporation is delayed 24 hours. If stand failure occurs, replant soybeans, but do not re-treat. Increase rate by 0.5 pint on medium-textured soils and 1 pint on fine-textured soils if heavy weed populations are anticipated.
trifluralin – 0.5 to 0.75 to 1 lb/A	Trifluralin (4 lb/gal formulation) — 1 to 1.5 to 2 pt/A	Preplant or preemergence	Annual grasses and some small-seeded broadleaf weeds such as pigweeds and purslane	Immediate incorporate 1 to 2 inches deep. Loss of 30% can be expected if incorporation is delayed 24 hours. If stand failure occurs, replant soybeans, but do not re-treat.
Preplant or preemergence				
clomazone – 1.0 to 1.25 lb/A	Clomazone (3 lb/gal formulations) — 2.6 to 3.3 pt/A	Preemergence	Annual grasses, purslane, spotted spurge, velvetleaf, wild poinsettia	**Do not** (1) apply within 1,500 feet of towns, subdivisions, commercial vegetables, greenhouses, or nurseries; (2) graze or feed forage, hay, or straw from treated fields to livestock; (3) apply with aerial equipment. Avoid off-site movement. Select rates according to soil texture and weed pressure.
cloransulam – 0.032 to 0.039 lb/A	FirstRate 84 DG — 0.6 to 0.75 oz/A	Within 2 weeks of planting for preplant applications or within 2 days after planting for PRE applications	Horseweed, morningglory, prickly sida, common ragweed, giant ragweed, smartweed, velvetleaf	At least 0.5 inch rainfall needed for incorporation. Mix with glyphosate or other nonselective herbicides to improve control of emerged vegetation. Mix with soil-applied herbicides to improve residual weed control.
dimethenamid-P – 0.47 to 0.98 lb/A	Outlook 6 EC — 10 to 21 oz/A	Preplant or preemergence	Annual grasses and some small-seeded broadleaf weeds	Provides poor control of most large-seeded broadleaf weeds. May cause temporary growth suppression of soybeans with high rainfall and water-saturated soil. **Do not** use more than 21 ounces of Outlook per season.

Soybean Weed Management

fomesafen – 0.25 to 0.38 lb/A	Fomesafen (2 or 1.88 lb/gal formulations) — 1 to 1.5 pt/A	Preemergence	Small-seeded broadleaf weeds, especially pigweeds and prickly sida	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** exceed a cumulative total of 0.375 pound of fomesafen per acre per year. Sufficient weed control depends on adequate rainfall for incorporation. Temporary injury to soybean can result if rainfall occurs soon after crop emergence; new soybean growth emerging after rainfall will be normal.
flumetsulam – 0.05 to 0.067 oz/A	Python 80 WDG — 1.0 to 1.33 oz/A	Preemergence	Annual broadleaf weeds	**Do not** (1) apply more than 1.4 ounces of Python in a year; (2) exceed 0.07 lb flumetsulam per year; (3) apply to soils with a pH of 7.8 or higher; (4) aerially apply.
flumioxazin – 0.063 to 0.096 lb/A	Flumioxazin 51 WDG — 1 to 2.5 oz/A or 4 SC — 1 to 2.6 oz/A	Preplant or preemergence	Prickly sida, morningglory, pigweeds, horseweed; other annual broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. Soybean injury is possible under cool and wet conditions following planting or when incorporating rainfall occurs as seedlings are cracking. To reduce likelihood of injury, use flumioxazin as a preplant herbicide and allow rainfall to occur before planting. Injury may occur if flumioxazin is used in the same field where flufenacet, alachlor, metolachlor/*S*-metolachlor, or dimethenamid-P will be used.
flumioxazin + chlorimuron – 0.076 lb/A	Valor XLT 40.3 WDG — 3 oz/A	Preplant or preemergence	Prickly sida, morningglory, pigweed, horseweed; other annual broadleaf weeds	See *Special Instructions and Remarks* for flumioxazin. Valor XLT has increased morningglory, annual grass, cocklebur, and sicklepod control and longer residual control of glyphosate-resistant horseweed (marestail).
flumioxazin + chlorimuron + thifensulfuron – 0.065 to 0.1 lb/A	Envive 41.3 WDG — 2.5 to 4 oz/A	Preplant or preemergence	Prickly sida, morningglory, pigweed, horseweed; other annual broadleaf weeds	See *Special Instructions and Remarks* for Valor XLT and flumioxazin. **Do not** apply more than 4 ounces per season.
flumioxazin + chlorimuron + metribuzin – 0.23 to 0.34 lb/A	Trivence 61.3 WDG — 6 to 9 oz/A	Preplant or preemergence	Prickly sida, morningglory, pigweed, horseweed; other annual broadleaf weeds	See Special Instructions and Remarks for Valor XLT, flumioxazin, and metribuzin. **Do not** apply more than 4 ounces per season. **Do not** apply to Black Belt soils with a pH > 7.0 or history of nutrient deficiency such as iron chlorosis.
flumioxazin + pyroxasulfone – 0.14 to 0.18 lb/A	Fierce 76 WDG — 3 to 3.75 oz/A	Preplant or preemergence	Prickly sida, morningglory, pigweed, crabgrass, barnyardgrass; other annual grass and broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. See Special Instructions and Remarks for flumioxazin. **Do not** apply more than 3.75 ounces of Fierce per season.
imazaquin – 0.125 lb/A	Scepter 70 DG — 2.86 oz/A	Preemergence	Cocklebur, morningglory, prickly sida, smartweed, and common ragweed	Sufficient weed control depends on adequate rainfall for incorporation. May be mixed with a grass or broadleaf herbicide registered for preemergence application. In no-till or double-crop following wheat, use at least 20 gallons water. Add a nonionic surfactant at 0.25% v/v.
metolachlor – 1.5 to 2.5 lb/A or *S*-metolachlor – 0.95 to 1.6 lb/A	Various formulations **(see table at beginning of section for specific rates by soil texture)**	Preemergence	Annual grasses and some small-seeded broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. Sufficient weed control depends on adequate rainfall for incorporation. If stand failure occurs, do not re-treat unless replanting is in the middles.

Soybean Weed Management

S-metolachlor + fomesafen – 1.32 lb/A	Prefix 5.29 EC — 2 pt/A	Preplant or preemergence	Annual grasses and broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. A maximum of 3 pints per acre can be applied within a single cropping season (includes preemergence and postemergence timings). Injury can occur if Prefix is applied at soybean cracking or after soybean emergence if rainfall occurs after soybean emergence.
S-metolachlor + metribuzin – 0.98 to 2 lb/A	Boundary 6.5 EC — 1.2 to 2.5 pt/A	Preplant or preemergence	Barnyardgrass, crabgrass, pigweed, prickly sida, hemp sesbania; other grass and broadleaf weeds	See *Special Instructions and Remarks* for metolachlor/*S*-metolachlor and metribuzin. **Do not** use rates > 1.5 pints per acre on soils above pH 7.0. **Do not** use on sands with less than 0.5% organic matter.
S-metolachlor + metribuzin + fomesafen – 1.2 to 2.69 lb/A	Intimidator 4.8 EC — 2 to 4.48 pt/A	Preplant or preemergence	Barnyardgrass, crabgrass, pigweed, prickly sida, hemp sesbania; other grass and broadleaf weeds	**Do not** exceed 4.48 pints per acre per season. This product contains fomesafen, which is a component of Reflex, Rhythm, Flexstar, and Prefix. **Do not** exceed a cumulative total of 0.375 pound of fomesafen per acre per year.
metribuzin – 0.25 to 0.63 lb/A	Various formulations **(see table at beginning of section for specific rates by soil texture)**	Preplant or preemergence	Hemp sesbania, prickly sida, early sicklepod; annual grasses and small-seeded broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. Injury may occur (1) on soils with calcareous surface or pH 7.5 and above, (2) to certain soybean varieties (see label for list), (3) on soil with < 0.5% organic matter, (4) when soybeans are planted < 1.5 inches deep, and (5) when heavy rains follow application, especially in poorly drained areas where water may stand several days.
metribuzin + chlorimuron – 0.19 to 0.28 lb/A	Canopy 75 DF — 4 to 6 oz/A	Preplant or preemergence	Cocklebur, hemp sesbania, prickly sida, morningglory, sicklepod, smartweed, ragweed, spotted spurge	See *Special Instructions and Remarks* for metribuzin. Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 3 ounces per acre on soil with pH >7.0. **Do not** apply to Black Belt soils with pH >7.0 or history of nutrient deficiency. **Do not** apply to field planted to metribuzin-sensitive soybean cultivars (See label). **Do not** apply on soils with a calcareous surface layer or pH >7.5.
pendimethalin – 0.5 to 0.75 to 1.0 lb/A	Prowl H_2O 3.8 CS — 1 to 1.5 to 2 pt/A or 3.3 EC — 1.2 to 1.8 to 2.4 pt/A	Preplant or preemergence	Annual grasses and some small-seeded broadleaf weeds such as pigweed and purslane	See *Special Instructions and Remarks* for pendimethalin. Rainfall or overhead irrigation is needed within 7 days for activity. Seedling diseases, cold weather, excessive moisture, shallow or deep planting, low or high soil pH, high soil salt concentration or drought can weaken seedlings and increase the possibility of crop damage.
pyroxasulfone – 0.08 to 0.18 lb/A	Zidua 85 WDG — 1.5 to 3.5 oz/A	Preplant or preemergence	Pigweed, crabgrass, barnyardgrass, prickly sida, velvetleaf; other grass and broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 2.1 ounces on coarse soils or more than 3.5 ounces on all other soils per cropping season.
sulfentrazone + cloransulam-methyl – 0.18 to 0.28 lb/A	Sonic 70 WDG — 4 to 6.45 oz/A	Preplant or preemergence	Yellow nutsedge, pigweed, prickly sida, morningglory, common ragweed, horseweed	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 8 ounces per season.

Soybean Weed Management

sulfentrazone + carfentrazone-ethyl – 0.15 to 0.23 lb/A	Spartan Charge 3.45 SL — 5.75 to 8.5 oz/A	Preplant or preemergence	Pigweed, morningglory; other broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 8.5 fluid ounces per acre per 12-month period. Soybean chlorosis and stunting may occur at pH 7.5 and above, as well as under cold and wet growing conditions. **Do not** use on soils classified as sand, which have less than 1% organic matter.
sulfentrazone + metribuzin – 0.23 to 0.51 lb/A	Authority MTZ 45 DG — 8 to 18 oz/A	Preplant or preemergence	Pigweed, morningglory, prickly sida; other annual broadleaf weeds	See *Special Instructions and Remarks* for metribuzin. Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 33 ounces per year. **Do not** apply after soybean emergence or severe injury may occur. **Do not** apply to soils classified as coarse or having less than 1% organic matter.
sulfentrazone + chlorimuron ethyl – 0.13 to 0.35 lb/A	Authority XL 70 DG — 3 to 8 oz/A	Preplant or preemergence	Pigweed, morningglory, prickly sida; other annual broadleaf weeds	Mix with glyphosate, paraquat, or glufosinate to control emerged vegetation. **Do not** apply more than 9.6 ounces per year. **Do not** apply after soybean emergence or severe injury may occur. **Do not** apply to Black Belt soils with a pH of more than 6.8 or history of nutrient deficiency.

Postemergence

Cultivation: Use so that the soil moved will not interfere with subsequent use of postemergence treatment. Cultivation within 7 days before or after a postemergence herbicide application may reduce control from that treatment. Deep cultivation (more than 2 inches) is usually not necessary and may damage the crop.

Early Postemergence				
acetochlor – 0.94 to 1.5 lb/A	Warrant 3 CS — 1.25 to 2 qt/A	Soybean emergence to R2; optimum at V2-V3	Annual grasses and pigweed	Warrant will not control emerged weeds. Apply postemergence to soybean but before weed seedling emergence. Mix with glyphosate in Roundup Ready soybean. **Do not** apply more than 4 quarts per season.
acifluorfen – 0.38 to 0.50 lb/A	Ultra Blazer 2L — 1.5 to 2 pt/A	Small, actively growing weeds	Hemp sesbania, morningglory, pigweeds (less than 2 inches)	**Do not** apply to soybeans and weeds under stressed conditions, within 50 days of harvest, or more than 4 pints per acre per growing season. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
acifluorfen + 2,4-DB 0.38 to 0.50 + 0.03 lb/A	Ultra Blazer 2L — 1.5 to 2 pt/A + 1.75 lb/gal formulation — 2.2 oz/A or 2 lb/gal formulation — 1.9 oz/A	Small, actively growing weeds	Hemp sesbania, morningglory, groundcherry, pigweeds (less than 2 inches)	See *Special Instructions and Remarks* for Ultra Blazer. **Do not** apply within 60 days of harvest. The 2,4-DB tank mixture will cause soybean foliage damage and may reduce yields. **Do not** use crop oil concentrate.
acifluorfen + bentazon – 0.75 lb/A	Storm 4 L — 1.5 pt/A	Small, actively growing weeds	Broadleaf weeds	**Do not** (1) apply more than 1.5 pints per application; (2) exceed 3 pints per season; (3) apply by air if sensitive crops, such as cotton or ornamentals are less than 200 feet down wind; (4) apply sequential treatments of Storm or Ultra Blazer less than 15 days after the initial treatments; (5) apply within 50 days before harvest. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.

Soybean Weed Management

bentazon – 0.75 to 1 lb/A	Basagran 4 L — 1.5 to 2 pt/A or 5 L — 1.2 to 1.6 pt/A	Small, actively growing weeds	Cocklebur, prickly sida (2 to 3 inches), smartweed	**Do not** apply more than 4 pints per acre per season, within 65 days of harvest, or under stressed conditions. For added control of pigweed and morningglory, 1 pint of Ultra Blazer plus surfactant may be added to Basagran. For added control of hemp sesbania, 0.5 to 1 pint of Ultra Blazer plus surfactant may be added to Basagran. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
bentazon + 2,4-DB – 0.75 to 1 + 0.03 lb/A	Basagran 4 L — 1.5 to 2 pt/A or 5 L — 1.2 to 1.6 pt/A + 1.75 lb/gal formulation 2.2 oz/A or 2 lb/gal formulation — 1.9 oz/A	Small, actively growing weeds	Cocklebur; prickly sida (2 to 3 inches), smartweed, morningglory	See *Special Instructions and Remarks* for Basagran. The 2,4-DB mix will cause soybean foliage injury and may reduce yields. **Do not** add surfactant to the 2,4-DB mixture.
chlorimuron – 0.0078 to 0.0104 to 0.0117 lb/A	Classic 25 DF — 0.5 to 0.67 to 0.75 oz/A	After soybeans have 1 trifoliate leaf until 60 days before maturity	Entireleaf and ivyleaf morningglory, giant ragweed, sicklepod (two applications 14 days apart)	**Do not** use on soybeans grown on Black Belt soils having a pH greater than 7.0 or a history of iron chlorosis. A sequential application may be applied 14 to 21 days after first application, but do not exceed a total of 1.5 ounces of per season. Soybeans may be stunted, particularly from sequential applications. Avoid off-target movement to non-target species. Add a nonionic surfactant at 0.25% v/v.
clethodim – 0.063 to 0.13 lb/A	1 EC — 12 to 16 oz/A or 2 EC — 6 to 8 oz/A **(see table at beginning of section for specific rates by species)**	Small, actively growing weeds	Annual grasses, johnsongrass, bermudagrass	Apply over-the-top or as a semi-directed spray to cover grasses. **Do not** apply (1) more than 32 ounces per acre per season (1 EC), (2) if rainfall is expected within 1 hour, or (3) to stressed plants. See label for sequential and mixture instructions for broadleaf herbicides. Add a nonphytotoxic crop oil concentrate at 1% v/v.
cloransulam – 0.25 oz/A	FirstRate 84 WG — 0.3 oz/A	Small, actively growing weeds	Common cocklebur, morningglory, ragweed, sicklepod	**Do not** (1) apply through irrigation system; (2) make more than two applications per season. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at1.2% v/v.
flumetsulam – 0.0063 lb/A	Python 80 WDG — 0.125 oz/A	When soybean is in 1–5 trifoliate growth stage	Prickly sida (less than 2 inches tall)	**Do not** apply to soybean with more than five trifoliates. **Do not** apply more than two postemergence applications, and applications must be separated by at least 14 days. If Python is applied preemergence and postemergence, the cumulative rate cannot exceed 0.138 ounces per season. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
fomesafen – 0.25 to 0.38 or 0.24 to 0.35 lb/A	Fomesafen (2 or 1.88 lb/gal formulations) — 1 to 1.5 pt/A	Small, actively growing weeds	Hemp sesbania, morningglory, Pennsylvania smartweed, pigweed	May cause temporary soybean leaf bronzing, crinkling, and/or spotting. Rainfall within 4 hours of application may reduce control. **Do not** (1) apply more than 1.5 pints per season; (2) apply to stressed plants; or (3) graze treated areas or harvest for forage or hay. Avoid off-target movement to non-target plants. Add a nonionic surfactant at 0.25% v/v.
fluazifop-P – 0.094 to 0.25 lb/A	Fusilade DX 2 EC — 6 to 16 oz/A (see table at beginning of section for specific rates by species)	Small, actively growing weeds	Annual grasses, seedling and rhizome johnsongrass, bermudagrass, volunteer grain sorghum, red rice	Apply over-the-top or as a semi-directed spray to cover the grasses. **Do not** apply (1) more than 32 ounces per acre per season, (2) after first bloom, or (3) if rainfall is expected within 1 hour after application. See Fusilade DX label for sequential and tank mix applications. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at1% v/v.

Soybean Weed Management

imazaquin – 0.063 or 0.13 lb/A	Scepter 70 DG — 1.43 to 2.86 oz/A	Small, actively growing weeds	Cocklebur (up to 12 inches tall), wild poinsettia, sicklepod.	For effective sicklepod control, use sequential preemergence and postemergence treatments. Apply at least 90 days before soybean harvest. **Do not** apply more than 0.25 pound of active ingredient per season or mix Scepter with postemergence grass herbicides. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
lactofen – 0.2 lb/A	Cobra 2 EC — 12.5 oz/A	Before soybeans exceed three trifoliate leaves	Hemp sesbania, morningglory, prickly sida, common ragweed, pigweed	Apply over-the-top or as a directed spray. Temporary speckling, burn, and/or crinkling of soybean leaves will occur. Do not (1) cultivate 5 days prior to application or while spraying; (2) apply more than once per growing season; (3) not later than 90 days before harvest. Add a nonionic surfactant at 0.125% v/v or a nonphytotoxic crop oil concentrate at 1 to 2 pt/A.
metolachlor – 1.5 to 2 lb/A or *S*-metolachlor – 0.95 to 1.27 lb/A	Various formulations **(see table at beginning of section for specific rates by soil texture)**	Soybean emergence to V3	Annual grasses and pigweed	Metolachlor/*S*-metolachlor should be applied postemergence to soybean but before weed seedling emergence. Mix with glyphosate in Roundup Ready soybean or with glufosinate in LibertyLink soybean.
S-metolachlor + fomesafen – 1.32 lb/A	Prefix 5.29 EC — 2 pt/A	When soybean is in 1–3 trifoliate growth stage	Morningglory, pigweed, hemp sesbania, Pennsylvania smartweed	See *Special Instructions and Remarks* for fomesafen and metolachlor/*S*-metolachlor. Application should be made to weeds no larger than 3- to 4-leaf growth stage. Prefix can be mixed with glyphosate that contains an adjuvant. If it is mixed with glyphosate not containing an adjuvant, add nonionic surfactant at 0.25% v/v. **Do not** add crop oil concentrate, as severe soybean injury can occur.
pyroxasulfone – 0.053 to 0.12 lb/A	Zidua 85 WDG — 1 to 2 oz/A or Anthem Maxx 4.3 SC – 1.65 to 3.25 oz/A	Soybean emergence to V3	Annual grasses and pigweed	Zidua or Anthem Maxx should be applied postemergence to soybean but before weed seedling emergence. Mix with glyphosate in Roundup Ready soybean or with glufosinate in LibertyLink soybean.
quizalofop-P – 0.034 to 0.069 lb/A	Quizalofop-P (0.88 lb/gal formulations) — 5 to 10 oz/A **(see table at beginning of section for specific rates by species)**	Small, actively growing weeds before soybean pod set, and/or 80 days before soybean harvest	Annual grasses, seedling and rhizome johnsongrass, bermudagrass, volunteer grain sorghum, red rice	**Do not** apply (1) with crop oil concentrates; (2) > 20 ounces per season; (3) to drought-stressed grasses; or (4) if rain is expected within 1 hour after application. **Do not** cultivate 7 days before or after application or mix with Basagran or chlorimuron except as specified on the label. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
sethoxydim – 0.19 to 0.38 lb/A	Poast Plus 1 EC — 24 to 48 oz/A **(see table at beginning of section for specific rates by species)**	Small, actively growing weeds	Annual grasses, seedling and rhizome johnsongrass, bermudagrass, red rice	**Do not** apply (1) to grasses under drought stress or herbicide injury; (2) if rainfall is expected within one hour after application; (3) within 90 days of harvest; (4) more than a total of 7.5 pints in one season. Basagran at labeled rate according to weed growth stage may be added, but Poast Plus rates must be increased 50%. Add a nonphytotoxic crop oil concentrate at 1 qt/A.
LibertyLink Varieties Only				
glufosinate – 0.53 to 0.66 lb/A	Glufosinate (2.34 lb/gal formulations) — 29 to 36 oz/A	Small, actively growing weeds from crop emergence to just before bloom	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in LibertyLink soybean varieties. Do not** apply more than 65 fluid ounces per season. Sequential applications should be made 10 to 14 days apart to improve control of larger weeds. A single application use rate can be as high as 36 fluid ounces per acre. Apply when temperatures are warm, as colder weather may reduce activity. **Do not** use nozzles and pressure that result in coarse spray droplets.

Soybean Weed Management

glufosinate + acetochlor – 0.53 to 0.66 lb/A + 0.94 to 1.5 lb/A	Glufosinate (2.34 lb/gal formulations) — 29 to 36 oz/A + Warrant 3 CS — 1.25 to 2 qt/A	Soybean emergence to V3	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in LibertyLink soybean varieties.** See *Special Instructions and Remarks* for glufosinate and Warrant.
glufosinate + fomesafen – 0.53 to 0.66 lb/A + 0.27 to 0.33 lb/A	Glufosinate (2.34 lb/gal formulations) — 29 to 36 oz/A + Fomesafen (2 lb/gal formulations) — 17 to 21 oz/A or Cheetah Max 3 SL — 34 to 42 oz/A	Small, actively growing weeds from crop emergence to just before bloom	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in LibertyLink soybean varieties.** See *Special Instructions and Remarks* for glufosinate and fomesafen.
glufosinate + metolachlor or *S*-metolachlor – 0.53 to 0.66 lb/A + 1.5 to 2 or 0.95 to 1.27 lb/A	Glufosinate (2.34 lb/gal formulations) — 29 to 36 oz/A + Various formulations **(see table at beginning of section for specific rates by soil texture)**	Soybean emergence to V3	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in LibertyLink soybean varieties.** See *Special Instructions and Remarks* for glufosinate and metolachlor/*S*-metolachlor.
glufosinate + pyroxasulfone – 0.53 to 0.66 lb/A + 0.053 to 0.12 lb/A	Glufosinate (2.34 lb/gal formulations) — 29 to 36 oz/A + Zidua 85 WDG — 1 to 2 oz/A or Anthem Maxx 4.3 SC — 1.65 to 3.25 oz/A	Soybean emergence to V3	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in LibertyLink soybean varieties.** See *Special Instructions and Remarks* for glufosinate and Zidua/Anthem Maxx.
Roundup-Ready Varieties Only				
glyphosate – 1 to 1.5 lb/A	Various formulations (see product label for specific rates)	From soybean emergence through R2 growth stage	Annual and perennial grass and broadleaf weeds	**For use only in Roundup Ready soybean varieties. Do not** apply more than 2.25 pounds (ae) in a single growing season. Sequential applications should be made 10 to 14 days apart to improve control of larger weeds. Glyphosate-resistant weeds are prevalent throughout Mississippi. See Herbicide Resistant Weed section for additional control options.
glyphosate + acetochlor – 1 to 1.5 lb/A + 0.94 to 1.5 lb/A	Various formulations (see product label for specific rates) + Warrant 3 CS — 1.25 to 2 qt/A	Soybean emergence to V3	Annual and perennial grass and broadleaf weeds	**For use only in Roundup Ready soybean varieties.** See *Special Instructions and Remarks* for glyphosate and Warrant.
glyphosate + fomesafen – 1.23 lb/A	Flexstar GT 3.5 2.82 SL — 3.5 pt/A	Small, actively growing weeds after first trifoliate	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in Roundup Ready soybean varieties.** See *Special Instructions and Remarks* for glyphosate and fomesafen.

Soybean Weed Management

glyphosate + *S*-metolachlor – 1.6 to 2.3 lb/A	Sequence — 2.5 to 3.5 pt/A	Soybean emergence to V3	Annual and perennial grass and broadleaf weeds	**For use only in Roundup Ready soybean varieties**. See *Special Instructions and Remarks* for glyphosate and metolachlor/*S*-metolachlor. Provides residual control of small-seeded grasses and broadleaf weeds. Rainfall is required for residual control. **Do not** apply > 3.5 pints per acre. Expect poor control of large-seeded grasses like browntop millet and Texas panicum.
glyphosate + *S*-metolachlor + fomesafen – 1 to 1.5 lb/A + 1.32 lb/A	Various formulations (see product label for specific rates) + Prefix 5.29 EC — 2 pt/A	When soybean is in 1–3 trifoliate growth stage	Annual grasses and broadleaf weeds; horseweed, morningglory, pigweed (less than 4 inches)	**For use only in Roundup Ready soybean varieties.** See *Special Instructions and Remarks* for glyphosate and Prefix.
glyphosate + pyroxasulfone – 1 to 1.5 lb/A + 0.053 to 0.12 lb/A	Various formulations (see product label for specific rates) + Zidua 85 WDG — 1 to 2 oz/A or Anthem Maxx 4.3 SC — 1.65 to 3.25 oz/A	Soybean emergence to V3	Annual and perennial grass and broadleaf weeds	**For use only in Roundup Ready soybean varieties.** See *Special Instructions and Remarks* for glyphosate and Zidua/Anthem Maxx.
Roundup Ready 2 Xtend Varieties Only				
dicamba – 0.5 lb/A	Engenia 5 SL — 12.8 oz/A	Preemergence or postemergence up to R1 growth stage	Broadleaf weeds	See www.engeniatankmix.com and the product label for instructions related to Engenia.
dicamba – 0.5 lb/A	XtendiMax with VaporGrip 2.91 SL or FeXapan with VaporGrip 2.91 SL — 22 oz/A	Preemergence or postemergence up to R1 growth stage	Broadleaf weeds	See www.xtendimaxapplicationrequirements.com and the product label for instructions related to XtendiMax.
Sulfonylurea-Tolerant Soybean (STS) or BOLT Varieties Only				
chlorimuron + thifensulfuron – 0.0066 to 0.02 lb/A	Synchrony XP 28.4 DG — 0.38 to 1.13 oz/A	Small, actively growing weeds from before soybean emergence to 60 days before harvest	Hemp sesbania, morningglory, yellow nutsedge, sicklepod	**For use only in STS and BOLT soybean varieties.** The 1- to 1.125-ounce rates provide some residual control of certain small-seeded broadleaf weeds. Add nonionic surfactant at 0.25% v/v or nonphytotoxic crop oil concentrate at 1% v/v if applied with a glyphosate formulation not preloaded with a surfactant.
halosufuron + thifensulfuron – 0.031 + 0.0036 lb/A	Permit Plus 75 WDG — 0.75 oz/A	Small, actively growing weeds from between the V1 and R2 soybean growth stages	Yellow nutsedge, purple nutsedge, hemp sesbania, common ragweed, velvetleaf	**For use only in STS and BOLT soybean varieties.** Only one application of Permit Plus is allowed per season. Add nonionic surfactant at 0.25% v/v or nonphytotoxic crop oil concentrate at 1% v/v if applied with a glyphosate formulation not preloaded with a surfactant. Ammonium sulfate at 8.5 to 17 pounds per 100 gallons of water is recommended.

Soybean Weed Management

Directed Sprays/Hooded Sprayers				
2,4-DB – 0.20 lb/A	1.75 lb/gal formulation 0.9 pt/A or 2 lb/gal formulation — 0.8 pt/A	After soybean are 8 inches tall	Cocklebur; partial control or of small pigweed and morningglory	Apply once or twice as a semi-directed spray when soybeans are 8 to 12 inches tall with sprays directed to contact no more than lower one-third of stems. Precise application is essential to prevent soybean injury. **Do not** apply if soybeans are under drought stress. Avoid spray pressures in excess of 40 psi. **Do not** add surfactant to spray mixtures.
linuron – 0.5 to 1.0 lb/A	50 DG – 1 to 2 lb/A or 4 L — 1 to 2 pt/A 4L	After soybean are 12 inches tall	Annual grasses and broadleaf weeds	Apply only single application as directed spray at base of crop plants striking the soybean plants no higher than 2 to 3 inches above the ground. **Do not** exceed 25 psi nozzle pressure or apply under windy conditions. Add a nonionic surfactant at 0.25% v/v.
linuron + 2,4-DB – 0.5 + 0.20 lb/A	Linuron 50 DG — 1 lb/A or 4 L — 1 pt/A + 2.4 DB 1.75 lb/gal formulation — 0.9 pt/A or 2 lb/gal formulation — 0.8 pt/A	After soybean are 12 inches tall	Most annual grasses, cocklebur, morningglory, hemp sesbania, sicklepod prickly sida	See *Special Instructions and Remarks* for linuron and 2,4-DB.
metribuzin – 0.25 to 0.50 lb/A	Various formulations **(see table at beginning of section for specific rates by soil texture)**	After soybean are 8 inches tall	Annual grasses and broadleaf weeds	Apply as a directed spray at the base of the soybean plants spraying no more than the lower 1/4 to 1/3 of the soybean plants. Soybean leaves contacted by the spray will be killed. **Do not** exceed 30 psi nozzle pressure or apply to sensitive varieties. Controls most broadleaf weeds < 3 inches tall except morningglory, most annual grasses < 1 inch tall. For hemp sesbania and prickly sida control, use 0.375 to 0.5 pounds active ingredient per acre.
metribuzin + 2,4-DB – 0.25 to 0.5 lb/A + 0.2 lb/A	Various formulations **(see table at beginning of section for specific rates by soil texture)** + 2,4-DB (2 lb/gal formulation) — 0.8 pt/A	After soybean are 8 inches tall	Annual grasses and broadleaf weeds	See *Special Instructions and Remarks* for metribuzin and 2,4-DB.
S-metolachlor + metribuzin – 01.06 to 1.63 lb/A	Boundary 6.5 EC — 1.3 to 2 pt/A	After soybean are 8 inches tall	Annual grasses and broadleaf weeds	Boundary may be mixed with other herbicides labeled for directed or hooded applications to improve control of emerged weeds. **Do not** exceed 3.9 pints of Boundary per acre per season. **Do not** allow spray to contact more than the lower 1/4 to 1/3 of soybean plants.
paraquat – 0.07 to 0.13 lb/A	Various formulations (see product label for specific rates)	After soybean are 8 inches tall	Annual grasses and broadleaf weeds, pigweeds, purslane	Use low rate for weeds less than 2 inches in height and the higher rate for weeds greater than 2 inches. Soybeans less than 8 inches will be injured or killed. Adjust nozzles to spray the lower 3 inches of the soybean plants. **Do not** exceed 30 psi to avoid drift. **Do not** apply more than twice. The second application should follow the first by 7 to 14 days.

Soybean Weed Management

Midseason Cocklebur Control				
2,4-DB – 0.20 lb/A	1.75 lb/gal formulation — 0.9 pt/A or 2 lb/gal formulation — 0.8 pt/A	7 to 10 days before soybean bloom until mid-bloom	Cocklebur	See *Special Instructions and Remarks* for 2,4-DB. Apply as broadcast spray after cocklebur plants have elongated and are as tall as soybean plants. 2,4-DB usually causes soybean injury but symptoms generally disappear within one week after treatment. **Do not** add surfactant.
Spot Spraying				
clethodim	Clethodim 1 or 2 EC — 0.25% + 1% crop oil concentrate by volume	Actively growing weeds	Johnsongrass, bermudagrass, annual grasses	Spray to wet foliage but not to point of runoff. Mixing example would be clethodim at 1 pint plus crop oil concentrate at 4 pints in 50 gallons of water.
fluazifop-P	Fusilade DX 2 EC — 0.5% + 0.25% nonionic surfactant or 1% crop oil concentrate by volume	Actively growing weeds	Johnsongrass (12 to 18 inches), bermudagrass, annual grasses	Spray to wet foliage but not to point of runoff. Make last application before soybean bloom. If a surfactant is used in lieu of crop oil concentrate, use only nonionic surfactants that contain at least 75% surface active agent. Mixing example would be Fusilade DX at 1 quart plus nonionic surfactant at 1 pint or crop oil concentrate at 4 pints in 50 gallons of water.
quizalofop-P	Quizalofop-P (0.88 lb/gal formulations) — 0.375% + 0.25% nonionic surfactant or 1% crop oil concentrate by volume	Actively growing weeds before soybean pod set and/or within 80 days of soybean harvest	Johnsongrass (10 to 16 inches), bermudagrass (6 inches), annual grasses	Spray to wet foliage but not to point of runoff. Mixing example would be quizalofop at 1.5 pints plus nonionic surfactant at 1 pint or crop oil concentrate at 4 pints in 50 gallons of water.
sethoxydim	Poast Plus 1 EC — 1.5% + 1.0% crop oil concentrate by volume	Actively growing weeds	Johnsongrass (15 inches), bermudagrass, annual grasses	Spray to wet foliage but not to point of runoff. **Do not** apply within 90 days of harvest. Mixing example would be Poast Plus at 6 pints plus crop oil concentrate at 4 pints in 50 gallons of water.
glyphosate	Various formulations — 1% by volume for annual weeds or 2% by volume for perennial weeds	After johnsongrass reaches 12 inches in height but before soybean pod set	Johnsongrass, bermudagrass, annual and perennial weeds	Use high rate mix for bermudagrass. Spray to wet foliage of johnsongrass stems or other undesirable vegetation. Non-Roundup Ready soybeans in the treated area will be killed. Keep drift to a minimum. **Do not** apply if soybeans are setting pods.
Preharvest				
carfentrazone – 0.016 to 0.023 lb	Aim 2 EC — 1 to 1.5 oz/A	Mature, fully developed soybean with 50% natural defoliation and remaining leaves yellow	Morningglory desiccation	**Do not** apply more than 1.5 ounces per acre per season. **Do not** apply within 3 days of harvest. Aim may be mixed with glyphosate to improve control of grasses and other weeds. Add a nonionic surfactant at 0.25% v/v or a nonphytotoxic crop oil concentrate at 1% v/v.
glyphosate – 0.75 to 3.5 lb/A	Various formulations (see product label for specific rates)	Preharvest but after soybean pods have lost all green color	Annual grasses, johnsongrass, some broadleaf weeds	**Do not** apply more than 3.5 pounds (ae) per acre for preharvest applications. **Do not** apply more than 1.5 pounds (ae) of glyphosate per acre by air. Allow a minimum of 7 days between application and harvest. Use rates greater than 1.5 pounds ae would be beneficial for perennial weed control.
paraquat – 0.13 to 0.25 lb/A	Various formulations (see product label for specific rates)	Mature, fully developed soybean with at least 50% of leaves dropped and remaining leaves yellow	Annual and perennial grasses and broadleaf weeds	Drought-stressed weeds will not be desiccated. Immature soybeans will be injured and yields reduced. **Interval between application and soybean harvest is a minimum of 15 days.** Add a nonphytotoxic crop oil concentrate at 1% v/v.

Soybean Weed Management

paraquat + sodium chlorate – 0.25 lb/A + 3 lb/A	Various formulations (see product label for specific rates)	Mature, fully developed soybean with at least 50% of leaves dropped and remaining leaves yellow	Annual and perennial grasses and broadleaf weeds	See *Special Instructions and Remarks* for paraquat and sodium chlorate.
saflufenacil – 0.022 to 0.044 lb/A	Sharpen 2.85 SC — 1 to 2 oz/A	Soybeans that have reached physiological maturity	Broadleaf weeds	Apply to indeterminate varieties with at least 65% brown pods and 70% defoliation or when seed moisture is 30% or less. Apply to determinant varieties when seed are fully developed with greater than 50% defoliation and remaining leaves are yellowing. **Do not** apply more than 2 fluid ounces per acre as a harvest aid per cropping season. **Do not** apply within 3 days of harvest. Add methylated seed oil at 1% v/v plus ammonium sulfate.
sodium chlorate – 6 lb/A	Various formulations (see product label for specific rates)	7 to 10 days before soybean harvest	Desiccation of most annual grasses and broadleaf weeds	Drought-stressed weeds will not be desiccated. Immature soybeans will be injured and yields reduced. **Do not** graze treated fields or feed treated bean foliage and fodder.

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